United States Army Corps of Engineers
New England District

# Final
# Phase I EPA SOW – Demonstrate Plume Capture Technical Memorandum Phase I Subtask 1.g Delineate Capture Zone based on Hydraulic and Geochemical Data

**Shepley's Hill Landfill**
**Former Fort Devens Army Installation**
**Devens, Massachusetts**

Contract No. W912WJ-19-D-0014

Contract Delivery Order No. W912WJ-20-F-0022

June 11, 2021

# Final 2020 Technical Memorandum Phase I Subtask 1.g

**Shepley's Hill Landfill**

**Former Fort Devens Army Installation**

**Devens, Massachusetts**

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# Acronyms and Abbreviations

| | |
|---|---|
| µg/L | microgram per liter |
| 3PE | three-point estimation |
| ATP | arsenic treatment plant |
| bgs | below ground surface |
| CL | cleanup level |
| DO | dissolved oxygen |
| EW | extraction well |
| ft | feet |
| Geosyntec | Geosyntec Consultants, Inc. |
| gpm | gallon per minute |
| KGS | KOMAN Government Solutions, LLC |
| LOD | limit of detection |
| LTM | long-term monitoring |
| mg/kg | milligrams per kilogram |
| mg/L | milligram per liter |
| msl | mean sea level |
| mV | millivolt |
| NIA | North Impact Area |
| ORD | USEPA Office of Research and Development |
| ORP | oxidation-reduction potential |
| redox | oxidation-reduction |
| SERES-Arcadis JV | SERES-Arcadis 8(a) Joint Venture 2, LLC |
| SHL | Shepley's Hill Landfill |
| site | Area of Concern 5 Shepley's Hill Landfill |
| Sovereign | Sovereign Consulting, Inc. |
| USACE | United States Army Corps of Engineers |
| USEPA | United States Environmental Protection Agency |

# 1 Introduction

SERES-Arcadis 8(a) Joint Venture 2, LLC (SERES-Arcadis JV) prepared this technical memorandum (Technical Memo 1) in accordance with a scope of work developed and agreed to between the US Department of the Army (Army) and the US Environmental Protection Agency (USEPA), Region 1, for the Area of Concern 5 Shepley's Hill Landfill (SHL) site (the site) located at the former Fort Devens Army Installation in Devens, Massachusetts (**Figure 1**). The SERES-Arcadis JV prepared this Memorandum on behalf of the United States Army Corps of Engineers – New England District, under contract number W912WJ-19-D-0014. Technical Memo 1, listed as Phase I Subtask 1.g in the USEPA Scope of Work (SOW), is one of five memorandums that are being developed in accordance with a scope of work first presented in USEPA's February 24, 2016 letter. The scope of the five technical memorandums were designed to further evaluate the efficacy of the existing groundwater recovery system, which includes two extraction wells (EWs) and the arsenic treatment plant (ATP). The scope of the five technical memorandums as described in the letter are:

1. Delineate the capture zone based on hydraulic and geochemical data (Technical Memo 1).
2. Delineate the lateral and vertical extent of the contaminant plume upgradient of the EWs (Technical Memo 2).
3. Delineate the lateral and vertical extent of the contamination downgradient of the extraction system along Scully Road (Technical Memo 3).
4. Validate the updated groundwater flow model with sufficient field measured hydraulic data to confirm the conclusions (Technical Memo 4).
5. Validate the extent of capture by evaluating concentration trends in North Impact Area (NIA) monitoring locations as compared to flow paths developed from the updated groundwater flow model (Technical Memo 5).

Technical Memo 1 includes the hydraulic analysis of the capture zone and presents groundwater geochemical data within the glacial overburden aquifer that may influence the contribution and transport of dissolved arsenic in groundwater in the vicinity and downgradient of the ATP located near the northern toe of SHL (**Figure 2**). The ATP was installed in 2006 to mitigate the potential migration of arsenic in groundwater from the northern area of SHL. To assess the effectiveness of the extraction system, piezometers (well couplets EPA-PZ-2012-1A/B through EPA-PZ-2012-7A/B) were installed in the vicinity of the two EWs (EW-1 and EW-4) by the USEPA Region 1 in 2012, and by Army in 2016/2017 (**Figure 3**). Groundwater elevations have been measured in the piezometers and nearby groundwater monitoring wells from 2016 to 2020 by the USEPA Office of Research and Development (ORD), and Army as part of the Long-Term Monitoring (LTM) program at SHL.

A groundwater flow model was developed for the area encompassing SHL using the United States Geological Survey MODFLOW numerical flow model to evaluate the potential migration of arsenic at SHL (Geosyntec Consultants, Inc. [Geosyntec] 2020). The model also included an evaluation of the potential hydraulic capture zone created by the two extraction wells using the particle tracking package associated with MODFLOW. To further evaluate the potential capture zone associated with the two EWs, the USEPA had requested that Army perform additional analysis of the flow potential created within the glacial overburden aquifer for the period 2016 to 2020 using a variety of traditional data evaluation methods and comparing them to the arsenic concentrations in groundwater at SHL. Technical Memo 1 provides additional information and analysis regarding the potential capture zone of the ATP, as well as a summary of geochemical conditions that relate to the contribution and extent of dissolved arsenic in groundwater.

## 1.1 Goals of Technical Memorandum

The primary objective of Technical Memo 1 is to develop a foundation for evaluating the capture zone of the extraction wells at the ATP and in the NIA. As this is one of several memos that are designed to build toward a conclusion regarding the capture zone and the overall migration potential of arsenic at the landfill, it establishes some of the basis for future technical memorandums. Specific goals of Technical Memo 1 include:

- Performing three-point estimation (3PE) vector analysis using groundwater elevation data collected by the USEPA and Army during the 2016-2020 period to assist in evaluating the capture zone of the ATP.
- Comparing the potential groundwater flow in the areas north and east of the ATP reflected in potentiometric maps to those reflected in 3PE vector analysis.
- Reviewing hydraulic factors that influence groundwater flow in the vicinity of the ATP and in those areas north and east of the ATP.
- Evaluating geochemical factors that influence the dissolution of arsenic to groundwater.
- Reviewing potential anthropogenic and geogenic contributors of arsenic in groundwater.
- Summarizing the distribution of arsenic in groundwater for further analysis in future technical memos.

Conclusions included in this first technical memorandum based on the above analyses and findings represent the beginning of the evaluation process and should not be viewed as a final conclusion regarding the capture zone and efficacy of the ATP. It should also be understood that the 3PE analyses provides a temporal illustration of the potential for groundwater flow based on hydraulic gradients alone, and that the actual flow may be more dynamic than what can be represented solely by gradient vectors. To address the temporal variations in the analyses for each monitoring event, directional gradient vectors were averaged for the well groupings for spring and fall events and were combined into a generalized interpretation of the potential capture zone for the extraction wells. Therefore, the flow and capture zone implied by the vectors in Technical Memo 1 should be viewed as a holistic illustration of the groundwater flow pattern surrounding the wells, and not as a definitive line of demarcation, as other factors influence actual flow toward the wells and capture that cannot be accounted for in this method. It should also be understood that the shape and location of the triangles that define the vectors have an influence on the vector gradient, and minor variations in groundwater elevations can impose significant changes in vector direction, particularly for those transmissive materials with relatively small horizontal hydraulic gradients.

## 1.2 Background – Development of SOW for Technical Memorandum

The primary considerations associated with the hydraulic analysis presented in Technical Memo 1 relate to the potential flow as defined by vector gradients using 3PE vector analysis as requested by USEPA. Vector gradients are calculated for triangular areas of the flow field using groundwater elevations measured in a group of three piezometers/wells located within a well array (**Figure 4**). The well array used for the 3PE analysis at SHL is a subset of the wells used to develop potentiometric maps for each monitoring event from 2016 to 2020 and constitutes the primary area of interest at the ATP and within the NIA. The wells and piezometers that best define the potential capture zone of extraction wells EW-1 and EW-4 for the 3PE analysis are those screened within the lower sands of the glacial aquifer overlying bedrock. These wells and piezometers are typically designated with a B or C at the end of the well name (**Table 1**). Well construction and boring logs are included in **Attachments 1** and **2**, and installation procedures for the piezometers are included in **Attachment 3**.

The original USEPA SOW for this Technical Memo was developed for groundwater monitoring events that occurred between 2016 and 2019; however, additional groundwater elevation measurements obtained during the 2020 events were also incorporated in the analysis (**Attachment 4**). These groundwater elevations were used to develop potentiometric maps for each groundwater monitoring event during the 2016 to 2020 period when sufficient data was available to complete an accurate potentiometric map and 3PE analysis for the area north and east of the extraction wells. Combining the potentiometric maps with the results of the 3PE gradient analysis provides a more comprehensive illustration of flow potential and capture zone created by the extraction wells.

To evaluate the potential influence of precipitation, snow melt, and other seasonal variations, 3PE vector analyses were performed for events that occurred in the spring and fall of each year where data was sufficient to provide enough detail and consistency over the entire period. The triangular array configurations developed for the 3PE analysis (**Figure 4**) were chosen based on the consistency of data from combined sources, including those groundwater elevations measured by the USEPA ORD, which provided important data obtained during spring and early summer months, and those obtained during LTM monitoring events which predominantly occurred in the fall. Some monitoring wells and piezometers that were included in developing the potentiometric maps were not included in the 3PE analysis, as groundwater elevation data was missing from several events for those wells and piezometers. As such, the well array included in **Figure 4** may appear different than those arrays that were proposed or used in previous analyses and presented in other documents.

Other hydraulic considerations reviewed included the potential variation of vertical gradients at piezometer and well pairs within the glacial aquifer. Vertical gradients reflect the potential for either upward/downward migration of arsenic north of the landfill, and the potential influence created by the pumping of extraction wells EW-1 and EW-4. Section 2 provides a more detailed discussion of the hydraulic considerations associated with the analyses, and Section 3 provides a discussion of the 3PE analyses, including a review of the potential capture zone as implied by potentiometric maps and gradient vectors. In addition to the hydraulic data that was used in the analysis of the groundwater flow potential at the site, geochemical data obtained from previous LTM monitoring events and investigations performed by KOMAN Government Solutions, LLC (KGS) were reviewed, and a summary of the geochemical factors and arsenic distribution within the aquifer are provided in Section 4.

# 2 Summary of Water Level Data (2016 to 2020)

Water level data from 2016 to 2020 were collected by USEPA ORD and Army. A review of available water level data indicated that the measurements obtained for some events did not include measurements in all the piezometers and wells. As such, the most comprehensive data sets were used for vertical gradient calculations for events during the 2017 to 2020 period. **Attachment 4** includes data used in the vertical gradient calculations, generation of the potentiometric maps, and 3PE analysis (**Attachment 7**). Water level data used to generate the potentiometric maps include additional wells/piezometers outside the area chosen for 3PE analyses north of the groundwater recovery system.

## 2.1 Vertical Gradients and Flow Potential

A review of vertical hydraulic gradients in the vicinity of the EWs indicate that the predominant vertical direction of flow is downward, with slight temporal variations when an upward gradient may be present (**Table 2**). Many of the calculated vertical gradients are relatively low, with greater than 25% of the vertical gradients less than or equal to 0.001 ft/ft. Zero or near-zero vertical hydraulic gradient occurred at several well pairs including EPA-PZ-2012-1A/B, EPA-PZ-2012-3A/B, SHP-2016-2A/B, and SHP-2016-5A/B. Overall, the vertical hydraulic gradients at most of the well pairs are slight with minor variation over the period of record. The gradients are likely influenced by a relatively high hydraulic conductivity of the glacial aquifer, with little to no impediment to downward flow between shallow and deep zones within the aquifer. Calculated vertical hydraulic gradients at well pairs SHP-2016-2A/B, SHP-2016-4A/B, and SHM-05-42A/B during the October 22, 2019 event appear to result from measurements that do not reflect those obtained during other events, and, as such, may have resulted from erroneous measurements. With the exception of these values, the vertical gradients for SHP-2016-1A/B, which is located between the two extraction wells, are consistently greater than 0.01 and generally exceed those measured in other well pairs.

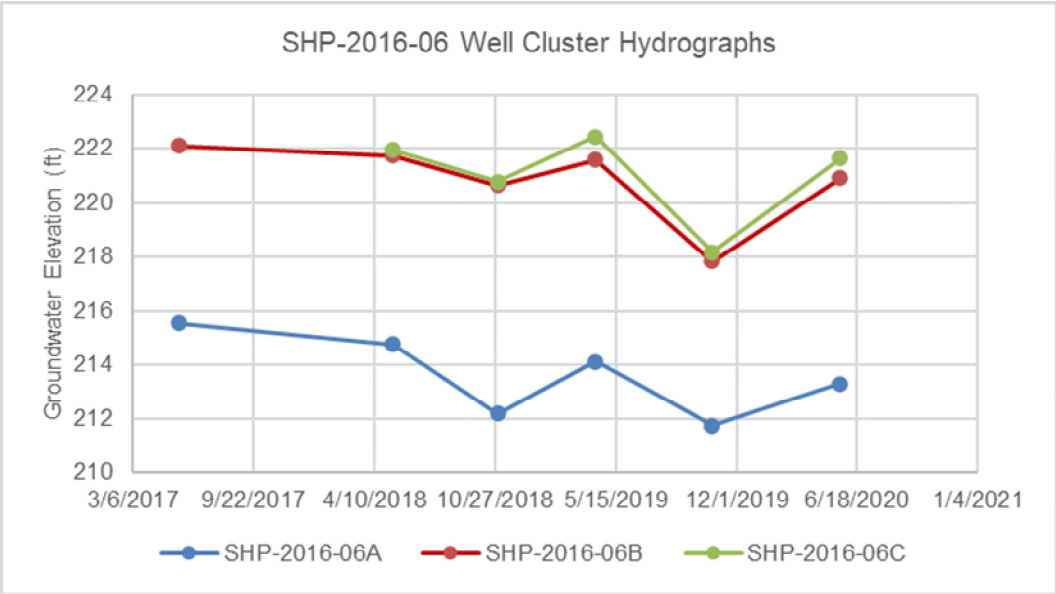
## 2.2 Potential Factors Influencing Groundwater Elevations and Flow Vectors

The two primary factors influencing groundwater elevations at the site are recharge to the aquifer and pumping rates at the two extraction wells. Recharge to the NIA occurs from the bedrock at Shepley's Hill southwest of the extraction wells, from Plow Shop Pond located east of the extraction wells, from snow melt, and from precipitation events. Below is a comparison of precipitation events occurring in the spring and fall of 2019 and the impact to water levels in the vicinity of the extraction wells. The 2019 data was selected for comparison as it provided the most consistent pumping data corresponding to each monitoring event. Groundwater levels appear to be slightly higher in the spring, as indicated by smaller depth-to-water measurements reported for the extraction wells. Groundwater elevations of surrounding monitoring wells and piezometers were consistently higher in the spring versus the fall for these two events by approximately two to three feet (**Attachment 4**). As such, the spring events have a greater potential to alter flow vectors evident in 3PE analysis.

| Precipitation Occurrence Prior to Monitoring Event | | | Groundwater Levels/Elevations in Piezometers/Wells Surrounding Extraction Wells | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | SHP-2016-1B | | SHP-05-45B | | EPA-2012-4B | | EPA-2012-6B | |
| **Monitoring Event** | **Precipitation Event** | **Precipitation (inches)** | **Depth to Water (ft)** | **GW Elevation (ft NAVD 88)** | **Depth to Water (ft)** | **GW Elevation (ft NAVD 88)** | **Depth to Water (ft)** | **GW Elevation (ft NAVD 88)** | **Depth to Water (ft)** | **GW Elevation (ft NAVD 88)** |
| ORD 5/13/2019 | 5/2/2019 | 0.20 | 15.41 | 211.83 | 15.87 | 213.24 | 13.46 | 212.93 | 21.12 | 212.96 |
| | 5/3/2019 | 0.16 | | | | | | | | |
| | 5/4/2019 | 0.35 | | | | | | | | |
| | 5/5/2019 | 0.14 | | | | | | | | |
| | 5/6/2019 | 0.02 | | | | | | | | |
| | 5/8/2019 | 0.18 | | | | | | | | |
| | 5/11/2019 | 0.03 | | | | | | | | |
| | 5/12/2019 | 0.04 | | | | | | | | |
| | 5/13/2019 | 0.07 | | | | | | | | |
| | **Total** | **1.19** | | | | | | | | |
| LTM 10/22/2019 | 10/17/2019 | 1.74 | 17.75 | 209.49 | 18.42 | 210.69 | 15.76 | 210.63 | 23.55 | 210.53 |
| | 10/18/2019 | 0.06 | | | | | | | | |
| | 10/21/2019 | 0.06 | | | | | | | | |
| | **Total** | **1.86** | | | | | | | | |

**Notes:**
GW = groundwater, ft NAVD 88 = feet North American Vertical Datum of 1988
Precipitation Data Source: https://www.ncdc.noaa.gov/cdo-web/datasets/GHCND/stations/GHCND:US1MAMD0025/detail

Recharge from the bedrock aquifer at Shepley's Hill is evident in the groundwater elevations measured at well cluster SHP-2016-06, which shows a consistent upward gradient from the deeper wells (SHP-2016-06B/C) to the shallow well (SHP-2016-06A), as shown in the following chart.




**Note**: 2020 data above were collected on May 21, 2020.

Well SHP-2016-06B and SHP-2016-06C are screened in bedrock at depths ranging 102 ft to 112 ft, and 123 ft to 133 ft, respectively. Recharge from Shepley's Hill is also evident in groundwater contours shown in **Figures 5** through **14** that reflect a northeastward potential for flow toward the two extraction wells.

## 2.3 Groundwater Contours

Potentiometric maps showing the groundwater contours (**Figures 5** through **14**) indicate that groundwater consistently flows northwest from Plow Shop Pond toward the NIA north of the extraction wells. This is likely driven by direct recharge along the northwestern shore of Plow Shop Pond. The Plow Shop Pond dam is located approximately 800 feet east of the ATP and is approximately 4 feet above the surface of Nonacoicus Brook. The difference in surface water elevation created by the impoundment is approximately 4 feet, as indicated by staff gages SWEL-107 (below the dam) and SWEL-106 at the dam. Groundwater contours southwest of the area of interest consistently show elevations within this range. A review of the potentiometric maps show that the groundwater contours wrap around the extraction wells on the western and eastern edges of the area, driven by recharge from Shepley's Hill and Plow Shop Pond. Vertical gradients (**Table 2**) at EPA-PZ-2012-2 indicate that ground water entering the area from the southeast is flowing predominantly horizontally within the saturated portion of the aquifer toward the northwest, with no significant vertical flow. All of these factors and evidence indicates that groundwater is funneling toward the area north of the ATP, with no northeasterly component of flow outside the area of interest.

# 3 Observed Groundwater Gradient Vectors

A groundwater gradient analysis was performed to assess the potential influence of extraction wells EW-1 and EW-4. The analysis was performed using 3PE (Beljin and Acree 2013), a three-point solution method used to estimate horizontal hydraulic gradients, estimate groundwater flow directions, and estimate velocity. This method is performed by dividing the area near the extraction wells into triangles with monitoring well locations forming the vertex of each triangle (**Figure 4**). The analysis was conducted for ten different time periods from 2016 through 2020 using both EPA ORD and Army LTM datasets. Datasets were selected such that the same triangles could be used for each period. The analysis was conducted semiannually to evaluate potential differences in hydraulic gradients between spring and fall. Calculations for each triangle and period are presented in **Attachment 7**. **Figures 5** through **14** graphically present the hydraulic gradient vectors obtained from the 3PE analysis for each triangle along with the groundwater elevation contours for each period. The length of the hydraulic gradient vectors is representative of the magnitude of the gradient. The vectors were scaled to a common value of 5,000 such that the vectors could be compared between the triangles. Groundwater hydraulic gradients less than 0.001 ft/ft were shown as red arrows to differentiate between triangles with relatively flat gradients and those with steeper gradients (shown in cyan). The groundwater elevation contours were first delineated independently of the 3PE analysis, then adjusted slightly such that there was agreement between the groundwater elevation contours and the resulting hydraulic gradient vectors from the 3PE analysis. The longest vectors (representing the steepest gradient) are closest to the extraction wells. In general, the vectors in the western triangles (north of EPA-PZ-2012-4B) are short, corresponding to a shallow hydraulic gradient, except for the October 22, 2019 gauging event (**Figure 12**). The hydraulic gradient vectors from the 3PE analysis match very closely with the groundwater elevation contours for each period. In general, groundwater flows to the northwest in the eastern portion of the area and groundwater flows towards the extraction wells in the triangles closest to those wells.

The variability in hydraulic gradient directions for each triangle are summarized in the rose diagrams presented in **Figures 15** through **18**. **Figure 15** illustrates the summary of all the triangles, the subsequent three figures focus in on specific areas of the analysis for clarity. Overall, for each triangle the groundwater flow directions are similar regardless of the period. For triangles closest to the extraction wells (**Figure 16**), groundwater flows towards the extraction wells regardless of the period. Triangles in the northern portion of the area have hydraulic gradients in general to the northwest (**Figure 17**). Similarly, triangles in the eastern portion of the area have hydraulic gradients to the northwest regardless of the period (**Figure 18**). **Table 3** summarizes the variability in the magnitude of hydraulic gradients for each triangle. For most of the triangles, especially those closest to the extraction wells, the overall average magnitude of hydraulic gradients matches closely with the average for fall events only and the average for spring events only, with the exception of Triangles 14, 17, 18, which have relatively flat gradients for the spring events only and much steeper gradients for the fall events only. The differences between the magnitude of the minimum and maximum hydraulic gradients can also be used to illustrate the variability between individual events. The greatest difference between the minimum and maximum hydraulic gradients occurs at Triangles 14, 16, and 19. Triangles 16 and 19 are closest to the extraction wells (**Figure 4**) and are the most influenced by changes in the pumping regime at the extraction wells. Triangle 14 is in the northern portion of the area (bounded by SHP-2016-2B, SHP-2016-4B, and SHP-2016-3B; **Figure 4**). Changes in the magnitude of the hydraulic gradient (and groundwater flow direction) are largely influenced by changes in the groundwater elevation at monitoring well SHP-2016-2B, which had a range of 3.29 ft (the average range for all groundwater elevations in the area was 3.07 ft).

The estimated groundwater capture zones were delineated based on the results of the 3PE analysis and the groundwater elevation contours for the average of spring and fall events for 2016 through 2020 (**Figures 19** and **20**, respectively). The potentiometric surfaces generated for the ten different time periods for 2016 through 2020 were gridded using Surfer such that mathematical operations could be performed. The average groundwater contours were generated by taking an average of all the spring event Surfer grids only and all the fall event Surfer grids only . The average groundwater hydraulic gradient arrows were similarly obtained by taking an average of the 3PE generated hydraulic gradients for each 3PE triangle for spring events only and fall events only to obtain an overall average for the 2016 through 2020 timeframes. The groundwater capture zone was estimated based on following the inferred flow lines from the groundwater elevation contours and the 3PE hydraulic gradient vectors. The estimated groundwater capture zones are similar for both spring and fall events, although the estimated capture zone for the average spring conditions is slightly smaller than the average fall conditions. The estimated capture zone extends north nearly to monitoring well SHP-2016-3B, to the west to EPA-PZ-2012-7B, and to the east between SHM-10-06 and SHM-10-06A. Estimated capture extends towards SHL to the south. Due to the relatively flat gradients (shown in red) for the average spring events (**Figure 19**), there is some uncertainty in the western extent of capture.

To provide a consistency check on using seasonal averages to estimate capture zones (as described in the paragraph above), the groundwater capture zones were estimated for two discrete intervals (October 20, 2016 and May 13, 2019; **Figures 21 and 22**, respectively). **Figure 21** shows the estimated capture zone for October 20, 2016. The estimated capture zone for October 20, 2016 is very similar to the estimated capture zone for average fall conditions for 2016 through 2020 (**Figure 20**). **Figure 22** illustrates the estimated capture zone for May 13, 2019. The northern extent of the estimated capture zone for May 13, 2019 is slightly smaller than the estimated capture zone for average spring conditions for 2016 through 2020 (**Figure 19**). The estimated capture zone extent is similar for the eastern and western directions.

# 4 Geochemistry and Arsenic Distribution

This section provides a summary of geochemical conditions and arsenic distribution in site groundwater to support an evaluation of the capture zones established by extraction wells EW-1 and EW-4.

## 4.1 Geochemical Conditions

Numerous factors affect release and attenuation of arsenic in groundwater, including system pH, the presence of competing anions, and oxidation-reduction (redox) conditions. Groundwater at SHL generally has circumneutral pH and relatively low concentrations of typical competing anions, such as phosphate. Therefore, the mobilization, fate, and transport of arsenic in site groundwater is primarily dependent on redox conditions. Thus, redox conditions within groundwater at SHL have been characterized previously, continue to be monitored as part of long-term monitoring, and are the focus of this geochemical conditions summary. This section summarizes the relevant conclusions from previous site monitoring and builds on those conclusions with a discussion of fall 2020 LTM results for redox indicators, including dissolved oxygen (DO), iron, manganese, dissolved organic carbon (DOC), and oxidation-reduction potential (ORP).

### 4.1.1 Summary of Geochemical Data Collected During Previous Investigations

The Final 2019 Annual Operations, Maintenance, and Monitoring Report (KGS/Trinity 2021) presented groundwater monitoring data for 2019, including groundwater elevations, field parameters, and analytical sampling results. Additionally, Appendix C (Table C-A) to the Fifth Five-Year Review Report (KGS 2020) included historical groundwater monitoring results. Based on these results, the following observations can be made regarding the groundwater flow and redox chemistry.

- Groundwater beneath the landfill originates from two primary recharge areas:
  - 1) Precipitation on Shepley's Hill, to the west of the Site, recharges bedrock groundwater, which flows east and up into overburden (seasonally, when the hydraulic gradient between bedrock and overlying overburden is upward).
  - 2) Groundwater within the overburden flows from south to north under the landfill, receiving additional recharge from an area of stormwater retention located along the southern boundary of the landfill.
- Based on DO results (less than 0.5 milligrams per liter [mg/L]) and ORP results (less than 0 mV), redox conditions in wells screened within the overburden and landfill waste horizon were consistently reducing. Under the actively reducing conditions present at the site, naturally occurring arsenic associated with iron and manganese oxyhydroxide minerals present in the overburden is released into solution due to reductive dissolution. Reducing conditions continue to be dominant along the groundwater flow path north from the landfill to the nearfield area and the ATP.
- As groundwater continues to flow north from the ATP toward Nonacoicus Brook, redox conditions become more laterally and vertically variable. Based on arsenic, DO, and iron results, conditions within shallow overburden downgradient of the ATP and into the NIA were observed to be relatively oxidizing, with relatively low arsenic and iron concentrations. However, at greater depths, conditions were reducing, and arsenic and iron concentrations were elevated. The geochemical profiles of iron and arsenic were attributed to the

reductive dissolution of iron oxides and concurrent release of both arsenic and iron into groundwater upgradient of the NIA. The vertical redox gradient, which changes from more oxic at shallow depths to more reducing at greater depths, potentially reflects the influence of oxic meteoric recharge.

As groundwater flows north through the NIA toward Nonacoicus Brook, the conditions become more oxidizing as additional oxic meteoric water recharges groundwater, likely resulting in iron and manganese mineral precipitation and subsequent arsenic attenuation via co-precipitation and adsorption.

### 4.1.2 2020 Redox Conditions

This section expands on the broad geochemical observations based on historical data summarized in Section 4.1.1 by discussing the spatial variability of redox indicators in 2020 groundwater results. Bedrock groundwater is discussed below in Section 4.1.2.1 and the remaining sections address groundwater occurring in till, overburden, and the landfill in several general areas of the site, including the upgradient area, landfill area, barrier wall area, nearfield area, and NIA. These areas are depicted on **Figure 23**. Groundwater results from fall 2020 monitoring are presented in **Table 4**. The lateral and vertical spatial distributions of dissolved arsenic, iron, and manganese in groundwater are presented on **Figures 24, 25, and 26**. Locations of the 2017 sampling and results, used to develop **Figures 25** and **26**, are included as **Attachment 8**. Although arsenic itself may be indirectly considered a redox indicator parameter, arsenic distribution relative to the primary groundwater redox indicators described in this section is discussed in more detail in Section 4.2.

Overall, conditions beneath the landfill are highly reducing and are consistent with reductive dissolution of iron and manganese. Decreases in sulfate concentrations beneath the landfill (relative to upgradient) may suggest that sulfate-reducing conditions are present in some areas beneath the landfill. However, metal-reducing conditions appear to be the dominant redox processes beneath and downgradient of the landfill. These conditions are typical of covered landfills, where DOC-rich leachate stimulates microbial growth resulting in oxygen depletion and metal reduction, and impermeable covers limit replenishment of oxygenated water. Downgradient (to the north) of the landfill, redox conditions become more variable as oxic meteoric inputs provide recharge to groundwater. Downgradient of the landfill, greater concentrations of dissolved iron and manganese are observed in deeper groundwater relative to shallow groundwater and overall concentrations are less than beneath the landfill. Near Nonacoicus Brook, DO concentrations indicate variably oxic groundwater, and dissolved iron and manganese concentrations decrease to below Cleanup Levels (CLs).

#### 4.1.2.1 Bedrock Groundwater

Seven bedrock wells were sampled in fall 2020 corresponding to locations in the upgradient area, landfill area, barrier wall, and nearfield area. The following bedrock wells were sampled: SHM-11-02, N5-P1, SHP-2016-06B, SHP-2016-06C, SHP-2016-07B, SHM-93-22C, SHM-93-10D. A summary of redox indicators is provided below.

- DO ranged from 0.36 to 2.46 mg/L, with most wells having DO concentrations near or less than 1 mg/L.
- ORP ranged from -122 to -7.5 mV.
- DOC concentrations ranged from non-detect (limit of detection [LOD] of 1.0 mg/L) to 4.8 mg/L.
- Dissolved iron ranged from 150 to 11,000 micrograms per liter (µg/L) in these wells except for SHM-93-22C, which did not have detectable dissolved iron (i.e., LOD of 50 µg/L).
- Dissolved manganese concentrations range from non-detect (LOD of 10 µg/L) to 980 µg/L.

- Sulfate concentrations ranged from 0.85 to 76 mg/L. SHM-11-02 was the only well to have sulfate concentrations less than 5 mg/L (0.85 J mg/L).

With a few exceptions, DO concentrations were less than 1 mg/L and many were less than 0.5 mg/L, indicating low-oxygen conditions, while in general, iron and manganese concentrations were relatively low (and less than the CLs). Sulfate concentrations up to 76 mg/L in the absence of elevated iron and manganese concentrations are consistent with potential sulfide oxidation in bedrock groundwater, as discussed further in Section 4.2.

#### 4.1.2.2 Upgradient Area

Upgradient groundwater was monitored at 6 monitoring wells in fall 2020, including SHM-93-24A, SHM-93-18B, SHL-7, SHL-12, SHL-15, and SHL-24. These wells are located to the south/southeast of the landfill and are screened in overburden or till. A summary of redox indicators is provided below.

- DO ranged from 0.69 to 8.09 mg/L, with 3 of 6 wells having DO concentrations less than 1 mg/L.
- ORP ranged from -1.4 to 257 mV.
- DOC concentrations ranged from non-detect (LOD of 1.0 mg/L) to 2.8 mg/L.
- Dissolved iron concentrations ranged from non-detect (LOD of 50 µg/L) to 4,500 µg/L; however, all but one well had dissolved iron concentrations less than 1,000 µg/L.
- Dissolved manganese concentrations ranged from non-detect (LOD of 3.0 µg/L) to 450 µg/L.
- Sulfate concentrations ranged from 3.0 to 90 mg/L.

Based on these results, upgradient groundwater conditions are generally oxic and exhibit low dissolved iron, dissolved manganese, and DOC concentrations. Sulfate concentrations in upgradient well SHL-12 were the greatest observed onsite during fall 2020.

#### 4.1.2.3 Landfill Area

Overburden groundwater beneath the landfill was monitored in fall 2020 at 7 monitoring wells, including SHM-10-07, SHM-10-11, SHM-10-12, SHM-10-13, SHM-10-14, SHM-10-15, and SHP-99-29X. A summary of redox indicators is provided below.

- DO ranged from 0.19 to 1.5 mg/L, with 6 of 7 wells having DO concentrations less than 1 mg/L.
- ORP ranged from -67.4 to 53.60 mV.
- DOC concentrations ranged from 2.1 to 4.3 mg/L.
- Dissolved iron concentrations ranged from 44,000 to 86,000 µg/L.
- Dissolved manganese concentrations range from 1,200 to 7,300 µg/L.
- Sulfate concentrations ranged from non-detect (LOD of 1.0 mg/L) to 56 mg/L.

Consistent with what would be expected below a landfill with an impermeable cap, the results show sub-oxic conditions and highly elevated dissolved iron and manganese concentrations indicative of active iron and manganese reductive dissolution. Sulfate concentrations generally decreased from south to north, beginning with sulfate concentrations similar to upgradient wells (56 mg/L at SHM-10-11) and decreasing to non-detect (LOD of 1.0 mg/L) at SHM-10-13 and SHM-10-14. This sulfate distribution suggest that conditions may become more reducing toward the interior of the landfill and that sulfate-reducing conditions may be observed in portions of the overburden beneath the landfill. DOC concentrations were generally greater than DOC concentrations observed at upgradient locations (0.68 to 2.8 mg/L). However, DOC concentrations in Landfill Area monitoring wells are low

compared to what is observed in landfill leachate at other sites, possibly because DOC is being consumed by microbial communities that are reducing iron, manganese, and potentially sulfate.

#### 4.1.2.4 Barrier Wall Area

Groundwater redox conditions in the vicinity of the barrier wall are spatially variable, depending largely on the proximity to and orientation relative to the barrier wall and landfill.

Directly adjacent (east or west) to the barrier wall (e.g., PZ-12-01, PZ-12-02, PZ-12-04, SHL-11, SHL-20, SHP-01-38A) conditions are reducing. Elevated dissolved iron and manganese concentrations (up to 75,000 and 3,300 µg/L for iron and manganese, respectively) are indicative of active metal reducing conditions, consistent with DO concentrations generally less than 1 mg/L and detectable DOC concentrations (up to 4.3 mg/L). These wells are within the footprint of the landfill or immediately adjacent to the landfill; therefore, it is expected that the conditions would be consistent with those beneath the landfill (Section 4.1.2.3). Similar to the landfill area wells, sulfate concentrations were variable but less than upgradient wells and in some cases non-detect, suggesting the potential for sulfate-reducing conditions in some areas.

Southeast and northeast of the barrier wall (e.g., SHL-3, SHL-10, SHP-01-36X, and SHP-01-37X) conditions are oxidizing. Relatively low or non-detect dissolved iron and manganese concentrations (up to 530 and 53 µg/L for iron and manganese, respectively) and sulfate concentrations ranging from 4.0 to 8.3 mg/L are consistent with DO concentrations generally greater than 1 mg/L (up to 3.98 mg/L) and positive ORP measurements (up to 130 mV).

#### 4.1.2.5 Nearfield Area

As groundwater moves north from beneath the landfill, vertical variability in redox conditions becomes apparent. Namely, directly downgradient (north) of the toe of the landfill within the nearfield area shallow groundwater (e.g., SHP-2016-1A, -2A, and -5A) exhibits generally oxic conditions, characterized by DO concentrations up to 3.52 mg/L and dissolved iron and manganese concentrations less than the CLs. In contrast, deeper groundwater monitored at the same locations (e.g., SHP-2016-1B, -2B, and -5B) generally has low DO concentrations (approximately 1 mg/L or less), mostly negative ORP results (as low as -87.7), and dissolved iron and manganese concentrations exceeding the CLs (up to 57,000 and 2,600 µg/L for iron and manganese, respectively), which indicate reducing conditions. In both shallow and deep wells at these locations, sulfate concentrations were similar and ranged from 2.6 to 9.6 mg/L, indicating that sulfate reducing conditions are likely not present in the nearfield area.

#### 4.1.2.6 North Impact Area

North of the nearfield area as groundwater flows into the NIA, concentrations of iron and manganese generally decrease from the levels observed both at the toe of Shepley's Hill and in the landfill footprint, where reductive dissolution of iron and manganese is evident. Like the nearfield area, a vertical gradient in groundwater chemistry is observed, with shallower groundwater (e.g., SHM-05-39A, SHM-99-31A, and SHM-99-31B) generally exhibiting lesser concentrations of dissolved iron and manganese than deeper groundwater in the same area (e.g., SHM-05-39B and SHM-99-31C). As groundwater flows to the northwest toward Nonacoicus Brook, the portion of the aquifer with iron and manganese concentrations exceeding the CLs narrows and becomes discontinuous for manganese. As the groundwater approaches the Brook (e.g., SHM-13-02, SHM-13-03, SHM-10-10, and SHM-13-15), DO concentrations are variable (ranging from 0.32 to up to 2.04 mg/L) and iron concentrations decrease to

below the CL. Manganese concentrations in monitoring wells SHM-13-03 and 13-SHM-13-15 are greater than in upgradient monitoring wells where iron concentrations are higher, indicating an increase in the redox potential (dominated by manganese reducing conditions over iron reducing conditions) at this outer fringe of the reducing zone. Higher manganese concentrations at this edge relative to more reducing zones closer to the landfill could be attributed to additional manganese reduction coupled to reduced iron oxidation as groundwater flows northward. Sulfate concentrations within the NIA were generally similar, ranging from 2.7 to 17 mg/L. The area of groundwater exceeding the arsenic, iron, and manganese CLs near Nonacoicus Brook is delineated in the downgradient direction (to the west) by monitoring wells SHM-10-03, SHM-13-02, and SHM-10-04 (**Figure 24**).

## 4.2 Arsenic Distribution in Groundwater

The mobilization, fate, and transport of arsenic in site groundwater is primarily dependent on redox conditions described herein. Arsenic concentrations within groundwater have been characterized and continue to be monitored as part of long-term monitoring. This section summarizes the relevant conclusions of the most recent update to the conceptual site model based on the characterization work performed to date and builds on those conclusions with a discussion of 2020 arsenic concentrations in groundwater.

### 4.2.1 Summary of Arsenic Data Collected During Previous Investigations

After closure of the landfill began in 1987, remedial investigations (RIs) confirmed the presence of various contaminants, including arsenic, in groundwater and other media. The ROD was completed in 1995, and Five-Year Review reports were completed in 2000, 2005, 2010, 2015, and 2020.

A supplemental groundwater investigation was completed in 2003 (Harding ESE 2003). A supplemental groundwater investigation and landfill cap assessments was also performed in 2005 (AMEC 2009), followed by a supplemental assessment in 2010 (Sovereign 2011).

In 2016 and 2017, KGS performed additional field investigation activities as required by the February 24, 2016 EPA SOW. Phase 1 of the EPA SOW identified five tasks and associated subtasks necessary to assess whether the existing arsenic extraction and treatment system provides sufficient containment/capture of the contamination migrating from SHL. This work was conducted to determine whether the selected Remedial Action at the SHL is protective of human health and the environment, and the remedy is operating as intended. This work included for groundwater: profile sampling at piezometers near extraction wells EW-01 and EW-04, bedrock well installation and sampling, groundwater profiling at transect borings located upgradient and downgradient from the extraction wells, and groundwater profiling in the NIA.

The following bullets summarize key findings for arsenic based on investigation work to date and previous submittals:

- Multiple potential sources of dissolved arsenic to the groundwater in and around SHL have been suggested, including anthropogenic sources from landfill waste and geogenic arsenic from the bedrock, till, and overburden sands.
    - *Anthropogenic sources*: Waste materials emplaced within the landfill primarily consist of municipal solid waste (MSW) with some demolition debris and MSW incinerator ash. In 2010, arsenic concentrations in 37 soil samples collected from intervals where landfill waste was

observed at 5 borings ranged from 3.8 to 31 milligrams per kilogram (mg/kg), with an average of 10.9 mg/kg. Ash was observed in 5 of the 37 samples (14 percent), and the average arsenic concentration in these 5 samples was 15.1 mg/kg (Sovereign Consulting, Inc. [Sovereign] 2011). These concentrations in solids may have reduced slightly over time due to infiltration of water through the waste material prior to landfill capping and closure activities in 1996, but arsenic concentrations in soils and solids sampled to date from landfill solids are relatively low. Low levels of arsenic may have migrated downward through the overburden into groundwater from MSW and demolition debris.

- *Geogenic sources*: Site data indicate that geogenic arsenic is most likely the predominant source of arsenic to groundwater at SHL.
  - *Geogenic Sources in Bedrock*: SHL overlies the Devens Gneiss Complex, known to contain arsenic-bearing minerals such as arsenopyrite and scorodite. Within the bedrock, oxidative dissolution of geogenic arsenic associated with recharge from precipitation on Shepley's Hill provides a source of arsenic to bedrock groundwater which subsequently flows into the overburden beneath the landfill. Analysis of arsenic mineralogy performed in 2011 associated with fractures in bedrock cores indicated that SHP-99-29X and N5-P1 both contained measurable arsenic, primarily in the form of arsenopyrite and scorodite. Under equilibrium conditions, dissolution of scorodite can produce aqueous arsenic concentrations on the order of 1,000 to greater than 10,000 µg/L (Gannett Fleming 2012). Seasonal upward groundwater flow within the landfill footprint is likely transporting dissolved arsenic from bedrock to the bedrock-overburden interface and into the overburden sands. Arsenic in groundwater samples collected in upgradient bedrock well CH-1D was detected at concentrations up to 570 µg/L in 2016 (KGS 2017). These concentrations indicate that arsenic associated with the mineralized fracture zones identified during the bedrock investigations may be contributing to the dissolved arsenic load observed in groundwater at SHL.
  - *Arsenic in the Bedrock-Till Interface*: Arsenic concentrations at the bedrock-till interface range from 9.4 mg/kg to 62 mg/kg (Sovereign 2011). This arsenic has accumulated through coprecipitation and/or adsorption over time, having originated from the geogenic arsenic in the bedrock described above, during seasonal periods of upward groundwater flow from the bedrock into the till matrix, which has a higher surface area. Arsenic could also accumulate in the till from the overburden during periods of downward groundwater flow. The layer of till is discontinuous across the site. Dissolution of arsenic from till materials via reductive dissolution provides an ongoing source of arsenic to groundwater.
  - *Arsenic in the Overburden Sand*: Arsenic derived from geogenic sources in the bedrock and/or till have accumulated in the overburden in the form of iron oxide coatings on the sand grains through coprecipitation and/or adsorption. Beneath and downgradient of the landfill area, variable redox conditions have developed both due to natural and potentially landfill-derived organic carbon, and result in reductive dissolution of arsenic from the iron-oxyhydroxide coated sands.

- Arsenic profile sampling performed in 2010 (Sovereign 2011) and 2017 resulted in the following conclusions regarding arsenic distribution in groundwater:
  - *2010 investigation*: Dissolved arsenic concentrations in vertical profile samples located within the landfill footprint ranged from 12.2 to 16,600 µg/L (with highest concentrations at SHL-10-15 and SHL-10-14). In bedrock below the landfill footprint, arsenic has been detected at concentrations

as high as 4,700 µg/L (monitoring well N5-P1). Monitoring wells with arsenic concentrations consistently at or above 1,000 µg/L are located within or adjacent to the bedrock slope, and likely recharge area, of Shepley's Hill, indicating that groundwater originating from Shepley's Hill may be a contributing source of arsenic within the footprint of the landfill. Concentrations of arsenic greater than 1,000 µg/L are also observed in wells north of the landfill that are screened in the overburden downgradient from the north toe of Shepley's Hill bedrock.

- *2017 investigations*: The fieldwork was conducted during August and September 2017 and included vertical profile groundwater sampling from selected direct-push soil boring locations. Soil borings were advanced to refusal at locations identified in the EPA SOW. Concentrations of arsenic in the groundwater profile samples ranged from non-detect (LOD of 3 µg/L) to a maximum of 7,600 µg/L in SB-2017-08. In general, ORP readings were positive in samples collected close to the water table and lower in the deeper groundwater samples where ORP generally ranged from -50 to -150 mV. Variability in sulfate concentrations at most sampled locations appears to correspond with potential sulfate-reducing conditions, except at locations SB-2017-10 and SB-2017-11, where sulfate concentrations at the deepest sampled intervals (72 to 74 ft bgs) were 14 and 16 mg/L along with elevated iron concentrations (48,000 to 60,000 µg/L). Relatively higher sulfate concentrations at these depths, compared to those in shallower samples, is consistent with potential sulfide oxidation in bedrock groundwater. Correspondingly, at most locations, higher arsenic concentrations were located at greater depths.

### 4.2.2 2020 Arsenic Distribution

This section expands on Section 4.2.1 by discussing arsenic concentrations and distribution in groundwater for monitoring conducted in fall 2020. Results from fall 2020 LTM are presented in **Table 4**. Areas of SHL are depicted on **Figure 23**. The lateral and vertical spatial distribution of dissolved arsenic, iron, and manganese in groundwater are presented on **Figures 24, 25, and 26**. Locations of the 2017 sampling and results, used to develop **Figures 25** and **26**, are included as **Attachment 8**. Iron and manganese distribution is discussed in more detail in Section 4.1.

As discussed in Section 4.1, conditions in SHL groundwater are highly reducing and consistent with reductive dissolution of arsenic, iron, and manganese. Downgradient (to the north) of the landfill, redox conditions become more variable as oxic meteoric inputs provide recharge to groundwater. Downgradient of the landfill, greater concentrations of dissolved metals are observed in deeper groundwater relative to shallow groundwater and overall concentrations are less than within the landfill footprint. Near Nonacoicus Brook, DO concentrations indicate at least seasonally oxic groundwater and decreasing dissolved arsenic concentrations relative to concentrations detected hydraulically upgradient.

Arsenic concentrations in groundwater at SHL in 2020 are generally consistent with those detected in prior years, though groundwater quality has improved over time. Mann-Kendall trend analysis performed using ProUCL software in 2020 indicated that concentrations at most wells analyzed are generally decreasing or have no significant trend. Technical Memo 5 will include arsenic concentration trend analysis and greater discussion on this topic.

#### 4.2.2.1 Bedrock Groundwater

Seven bedrock wells were sampled in 2020 corresponding to locations in the upgradient area, landfill area, barrier wall, and nearfield area (SHM-11-02, N5-P1, SHP-2016-06B, SHP-2016-06C, SHP-2016-07B, SHM-93-22C, and SHM-93-10D). Concentrations of arsenic in bedrock in fall 2020 ranged from non-detect (LOD of 3.0 µg/L) to 1,100 µg/L.

As mentioned in Section 4.1.2.1, DO concentrations in bedrock groundwater were less than 1 mg/L and many were less than 0.5 mg/L, indicating low-oxygen conditions, while iron and manganese concentrations were relatively low in all areas but at Barrier Wall bedrock monitoring well SHM-11-02, located hydraulically downgradient of the landfill. At bedrock wells that exceed the CL for arsenic in other locations (SHP-2016-06B and SHP-2016-06C in the Nearfield Area and SHP-2016-07B and N5-P1 in the Landfill Area), there are relatively low iron and manganese results (below the CLs), and low-oxygen conditions. The presence of arsenic with low iron and manganese is consistent with the potential release of geogenic arsenic through oxidative dissolution of sulfide minerals; this sulfide oxidation contributes to groundwater oxygen consumption. Sulfate concentrations observed up to 76 mg/L in bedrock wells in fall 2020 may be consistent with sulfide oxidation in bedrock.

#### 4.2.2.2 Upgradient Area

Upgradient groundwater was sampled from six monitoring wells located to the south/southeast of the landfill and screened in overburden or till in fall 2020 (SHM-93-24A, SHM-93-18B, SHL-7, SHL-12, SHL-15, and SHL-24). Concentrations of arsenic in groundwater ranged from non-detect (LOD of 3.0 µg/L) to 26 µg/L. Only one of the six wells, SHL-15, which is installed adjacent to the landfill cap in the southwest portion of the site, exceeded the CL for arsenic. This location is also the only upgradient well with a dissolved iron concentration greater than 1,000 µg/L (4,500 µg/L). Upgradient groundwater conditions are generally oxic and exhibit low dissolved metals concentrations.

#### 4.2.2.3 Landfill Area

Overburden groundwater beneath the landfill was sampled in 2020 at seven monitoring wells (SHM-10-07, SHM-10-11, SHM-10-12, SHM-10-13, SHM-10-14, SHM-10-15, and SHP-99-29X). Each of the seven monitoring wells exceeded the CL of 10 µg/L in 2020; concentrations ranged from 430 µg/L (at both SHM-10-11 and SHM-10-13) to 6,800 µg/L at SHM-10-15. Three of the highest detected concentrations of arsenic in groundwater in fall 2020 were in samples collected from landfill area overburden wells SHM-10-12, SHM-10-14, and SHM-10-15. As described in Section 4.1.2.3, landfill area locations had low DO (6 of 7 wells with DO less than 1 mg/L) and ORP (most wells with ORP measurements less than 0 mV) and higher concentrations of dissolved iron (44,000 to 86,000 µg/L) and manganese (1,200 to 7,300 µg/L). Results are consistent with what would be expected below a landfill with an impermeable cap and indicative of active reductive dissolution of arsenic, iron, and manganese.

#### 4.2.2.4 Barrier Wall Area

The barrier wall was installed between the landfill and Plow Shop Pond in an area of groundwater exceeding the CL for arsenic to mitigate migration of arsenic-contaminated groundwater to Red Cove of Plow Shop Pond. Monitoring wells directly adjacent (east or west) to the barrier wall along the northern third of the wall (e.g., PZ-12-01, PZ-12-02, PZ-12-03, PZ-12-04, SHL-11, and SHL-20) have the greatest concentrations of arsenic in groundwater in the Barrier Wall area, ranging from 270 to 900 µg/L. Elevated dissolved iron and manganese

concentrations (up to 75,000 and 3,300 µg/L for iron and manganese, respectively) are indicative of active reducing conditions. These wells are within the footprint of the landfill or are immediately adjacent to it.

East and southeast of the landfill footprint and barrier wall (e.g., SHL-3, SHL-10, SHP-01-36X, and SHP-01-37X) conditions are oxidizing and arsenic concentrations are lower, ranging from non-detect (LOD) of 3 µg/L) to 6.6 µg/L, below the CL for arsenic. These wells are located outside of the area of groundwater influenced by both the landfill and bedrock at Shepley's Hill.

#### 4.2.2.5 Nearfield Area

As described in Section 4.1.2.5, as groundwater moves north from beneath the landfill, vertical variability in arsenic distribution and redox conditions is apparent. Downgradient (north) of the toe of the landfill arsenic concentrations in shallow groundwater at SHP-2016-1A, -2A, -3A, -4A, and -5A exhibit generally oxic conditions with low concentrations of arsenic (non-detect to 8.5 µg/L). These wells have a maximum bottom screen depth of 30 ft below ground surface (bgs). In contrast, monitoring wells screened in deeper groundwater in this area (e.g., SHP-2016-1B, -2B, -3B, -4B, and -5B) had detected concentrations of arsenic in groundwater ranging from 140 to 1,700 µg/L in fall 2020. These wells have a maximum screened depth of 90 ft bgs. Arsenic concentrations in groundwater are greater in this area in the deep overburden, and are below the CLs in shallow overburden, reflecting oxic meteoric water recharge to groundwater downgradient of the landfill footprint.

#### 4.2.2.6 North Impact Area

North of the nearfield area in the NIA, concentrations of all dissolved metals, including arsenic, iron, and manganese generally decrease from the levels observed both at the toe of Shepley's Hill and within the landfill footprint, where reductive dissolution of metals is evident. As in the Nearfield Area, shallower groundwater (e.g., SHM-05-39A, SHM-99-31A, and SHM-99-31B) generally exhibits lesser concentrations of all dissolved metals (arsenic, iron, and manganese) than deeper groundwater in the same area (e.g., SHM-05-39B and SHM-99-31C). As groundwater flows to the northwest toward Nonacoicus Brook, the portion of the aquifer where arsenic exceeds the CL narrows. Arsenic at well SHM-13-03, just upgradient of Nonacoicus Brook, was detected at a concentration of 83 µg/L in fall 2020, compared to concentrations at the wells located approximately 300 ft hydraulically upgradient to the southeast, where concentrations of arsenic detected in groundwater in fall 2020 ranged from 420 to 2,200 µg/L. As described in Section 4.1.2.6, DO concentrations are variable in this area, and more oxic groundwater conditions support attenuation of dissolved metals.

# 5 Summary and Conclusions

The ATP was installed to mitigate the potential migration of arsenic in groundwater from the northern area of the SHL in 2006. To assess the effectiveness of the ATP, piezometers were installed in the vicinity of the two extraction wells (EW-1 and EW-4) by EPA Region 1 in 2012, and by others in 2016 and 2017. The piezometers were installed to obtain groundwater elevations within the shallow and deep aquifer zones of the glacial outwash aquifer to further evaluate groundwater gradients and the capture zone of the two extraction wells presented in previous technical memorandums and reports. This technical memorandum used data from select piezometers and monitoring well pairs located north of the landfill to further evaluate the capture zone created by the extraction wells based on hydraulic and geochemical data obtained during the period 2016 to 2020 in accordance with requests and comments provided by EPA Region 1, the ORD, and the Massachusetts Department of Environmental Protection.

An analysis of groundwater gradients based on potentiometric maps and three-point analysis (3PE) indicate that groundwater flow direction varies in the northern portion of the landfill. The influence of Shepley's Hill and its underlying bedrock aquifer creates a northeasterly flow component along the western edge of the landfill southwest of the ATP, while Plow Shop Pond creates an elevated hydraulic head that induces a flow to the northwest. These two hydraulic gradients create a funnel-like flow system in the northern portion of SHL and the area north of the landfill. Gradients induced by the pumping of the two extractions wells have the potential to increase the flow from these two influences toward the northern portion of landfill by increasing the gradient from Shepley's Hill and the diverting water flowing north of the extraction wells and the ATP toward the central and western portions of the landfill as evident in potentiometric maps and 3PE analysis. The results indicate that groundwater flow from the western and eastern portions of the landfill migrate toward the extraction wells north of the toe of the SHL. Flow from areas east of the SHL footprint flow toward the area north of the landfill, with some flow toward the extraction wells and some appearing to flow north or northwestward. Capture zones shown in Technical Memo 1 are based solely on groundwater gradients and may not fully represent the complete three-dimensional aspect of the capture zone for EW-1 and EW-4.

Sources of dissolved arsenic in groundwater include anthropogenic (landfill) and geogenic sources (arsenic-bearing sulfide minerals in bedrock, arsenic deposited at the bedrock-till interface, and arsenic accumulation on overburden sand grains in the form of iron oxide coatings). Groundwater within the landfill footprint and immediately downgradient with high concentrations of all dissolved metals are consistent with what would be expected below a landfill with an impermeable cap and indicative of active reductive dissolution of arsenic, iron, and manganese. Arsenic in deep overburden and in bedrock groundwater at locations with low concentrations of iron and manganese and low-oxygen conditions is consistent with the release and subsequent accumulation of arsenic at the bedrock-till interface and in overburden sands through oxidative dissolution of arsenic-bearing sulfide minerals in bedrock. The distribution of dissolved arsenic in groundwater can be attributed to contributions from these two sources. Capture zones shown on Figures 19 and 20 of this Technical Memo will be overlaid on and compared to the extent of arsenic in groundwater in Technical Memo 2.

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# Tables

**Table 1**
**Well and Piezometer Construction**
**2021 Technical Memo**
**Shepley's Hill Landfill, Former Fort Devens Army Installation, Massachusetts**

| Well ID | Location | Monitoring Frequency | TOR Elevation (feet amsl) | Screen Interval (feet bgs) | Screen Elevation (feet amsl) | Formation Type at Screen Interval |
|---|---|---|---|---|---|---|
| EPA-PZ-2012-1A | Nearfield Area | Semiannual | 223.79 | 20.0 - 25.0 | 203.79 - 198.79 | OB (shallow) |
| EPA-PZ-2012-1B | Nearfield Area | Semiannual | 223.53 | 70.0 - 75.0 | 153.53 - 148.53 | OB (deep) |
| EPA-PZ-2012-2A | Nearfield Area | Semiannual | 223.38 | 20.0 - 25.0 | 203.38 - 198.38 | OB (shallow) |
| EPA-PZ-2012-2B | Nearfield Area | Semiannual | 223.37 | 75.0 - 80.0 | 148.37 - 143.47 | OB (deep) |
| EPA-PZ-2012-3A | Nearfield Area | Semiannual | 222.65 | 20.0 - 25.0 | 202.65 - 197.65 | OB (shallow) |
| EPA-PZ-2012-3B | Nearfield Area | Semiannual | 222.57 | 70.0 - 75.0 | 152.57 - 147.57 | OB (deep) |
| EPA-PZ-2012-4A | Nearfield Area | Semiannual | 226.60 | 20.0 - 25.0 | 206.6 - 201.60 | OB (shallow) |
| EPA-PZ-2012-4B | Nearfield Area | Semiannual | 226.39 | 70.0 - 75.0 | 156.39 - 151.39 | OB (deep) |
| EPA-PZ-2012-5A | Nearfield Area | Semiannual | 220.01 | 20.0 - 25.0 | 200.01 - 195.01 | OB (shallow) |
| EPA-PZ-2012-5B | Nearfield Area | Semiannual | 219.38 | 80.0 - 85.0 | 139.38 - 134.38 | OB (deep) |
| EPA-PZ-2012-6A | Nearfield Area | Semiannual | 234.25 | 25.0 - 30.0 | 209.25 - 204.25 | OB (shallow) |
| EPA-PZ-2012-6B | Nearfield Area | Semiannual | 234.08 | 75.0 - 80.0 | 159.08 - 154.08 | OB (deep) |
| EPA-PZ-2012-7B | Nearfield Area | Semiannual | 234.03 | 60.0 - 65.0 | 174.03 - 169.03 | OB (deep) |
| SHM-05-42A | Nearfield Area | Annual | 216.81 | 40.0 - 42.0 | 176.81 - 174.81 | OB (shallow) |
| SHM-05-42B | Nearfield Area | Annual | 216.80 | 70.0 - 72.0 | 146.8 - 144.80 | OB (mid) |
| SHM-10-06 | Nearfield Area | Annual | 232.91 | 69.5 - 79.5 | 163.41 - 153.41 | OB (deep) |
| SHM-10-06A | Nearfield Area | Annual | 248.54 | 77.0 - 87.0 | 171.54 - 161.54 | OB (deep) |
| SHM-96-5B | Nearfield Area | Annual | 218.92 | 80.0 - 90.0 | 138.92 - 128.92 | OB |
| SHM-96-5C | Nearfield Area | Annual | 218.39 | 50.0 - 60.0 | 168.39 - 158.39 | OB (mid) |
| SHP-05-45A | Nearfield Area | Annual | 228.48 | 20.0 - 25.0 | 208.48 - 203.48 | OB (shallow) |
| SHP-05-45B | Nearfield Area | Annual | 229.11 | 65.0 - 75.0 | 164.11 - 154.11 | OB (mid) |
| SHP-05-46A | Nearfield Area | Annual | 228.18 | 20.0 - 25.0 | 208.18 - 203.18 | OB (mid) |
| SHP-05-46B | Nearfield Area | Annual | 227.60 | 65.0 - 75.0 | 162.60 - 152.60 | OB (shallow) |
| SHP-2016-1A | Nearfield Area | Semiannual | 227.27 | 13.9 - 23.0 | 213.37 - 204.27 | OB (shallow) |
| SHP-2016-1B | Nearfield Area | Semiannual | 227.24 | 75.0 - 85.0 | 152.24 -142.24 | OB (deep) |
| SHP-2016-2A | Nearfield Area | Semiannual | 225.93 | 20.0 - 25.0 | 205.93 - 200.93 | OB (shallow) |
| SHP-2016-2B | Nearfield Area | Semiannual | 225.95 | 80.0 - 85.0 | 145.95 - 140.95 | OB (deep) |
| SHP-2016-3A | Nearfield Area | Semiannual | 223.18 | 20.0 - 25.0 | 203.18 - 198.18 | OB (shallow) |
| SHP-2016-3B | Nearfield Area | Semiannual | 223.18 | 80.0 - 85.0 | 143.18 - 138.18 | OB (deep) |
| SHP-2016-4A | Nearfield Area | Semiannual | 229.97 | 25.0 - 30.0 | 204.97 - 199.97 | OB (shallow) |
| SHP-2016-4B | Nearfield Area | Semiannual | 229.75 | 85.0 - 90.0 | 144.75 - 139.75 | OB (deep) |
| SHP-2016-5A | Nearfield Area | Semiannual | 227.01 | 25.0 - 30.0 | 202.01 - 197.01 | OB (shallow) |
| SHP-2016-5B | Nearfield Area | Semiannual | 226.95 | 85.0 - 90.0 | 141.95 - 136.95 | OB (deep) |
| SHP-2016-06A | Nearfield Area | Semiannual | 241.90 | 81.0 - 86.0 | 160.90 - 155.90 | BR |
| SHP-2016-06B | Nearfield Area | Semiannual | 241.89 | 102.0 -112.0 | 139.89 - 129.89 | BR |
| SHP-2016-06C | Nearfield Area | Semiannual | 241.92 | 123.0 - 133.0 | 118.92 - 108.92 | BR |

**Notes:**
TOR elevations from November 2017 Shepley's Hill Landfill (SHL) survey data (North American Vertical Datum [NAVD] 1988)

Destroyed wells removed from program: N4-P1, N4-P2, N4-P3, and SHP-99-34A. SHP-13-03 in Nonacoicus Brook not found.
Locations compiled from the SHL LTMMP Update (Sovereign Consulting, Inc. 2015) and LTMMP Addendum (KOMAN Government Solutions, LLC 2018).
* Estimated value derived from Supplemental Groundwater Investigation (Harding ESE 2003).
** Location added to LTMMP list in response to United States Environmental Protection Agency (USEPA) informal dispute resolution letter dated (USEPA 2016).

**Acronyms and Abbreviations:**
amsl = above mean sea level (NAVD 88)
bgs = below ground surface
BR = bedrock
LTMMP = Long-Term Monitoring and Maintenance Plan
OB = overburden
TOR = top of riser

**Table 2**
**Summary of Vertical Gradients Measured at Piezometer and Monitoring Well Pairs**
**2021 Technical Memo**
**Shepley's Hill Landfill, Former Fort Devens Army Installation, Massachusetts**

| Well ID | Reference Elevation (ft NAVD 88) | Screen Elevation (ft NAVD 88) | Screen Midpoint Elevation (ft NAVD 88) | 11/2/2017 | | 11/1/2018 | | 5/13/2019 | | 10/22/2019 | | 5/18/2020 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Groundwater Elevation (ft NAVD 88) | Calculated Vertical Hydraulic Gradient (ft/ft) | Groundwater Elevation (ft NAVD 88) | Calculated Vertical Hydraulic Gradient (ft/ft) | Groundwater Elevation (ft NAVD 88) | Calculated Vertical Hydraulic Gradient (ft/ft) | Groundwater Elevation (ft NAVD 88) | Calculated Vertical Hydraulic Gradient (ft/ft) | Groundwater Elevation (ft NAVD 88) | Calculated Vertical Hydraulic Gradient (ft/ft) |
| EPA-PZ-2012-1A | 223.79 | 203.79 - 198.79 | 201.29 | 213.17 | -0.0002 | 213.10 | 0.0000 | 213.72 | 0.0002 | 211.64 | -0.0018 | 213.41 | -0.0006 |
| EPA-PZ-2012-1B | 223.53 | 153.53 - 148.53 | 151.03 | 213.18 | | 213.10 | | 213.71 | | 211.73 | | 213.44 | |
| EPA-PZ-2012-2A | 223.38 | 203.38 - 198.38 | 200.88 | 213.42 | 0.0029 | 213.23 | 0.0027 | 213.67 | 0.0013 | 211.96 | 0.0005 | 213.44 | 0.0009 |
| EPA-PZ-2012-2B | 223.37 | 148.37 - 143.47 | 145.92 | 213.26 | | 213.08 | | 213.60 | | 211.93 | | 213.39 | |
| EPA-PZ-2012-3A | 222.65 | 202.65 - 197.65 | 200.15 | 212.55 | 0.0018 | 212.45 | 0.0016 | 213.19 | 0.0010 | 210.97 | 0.0000 | 212.84 | -0.0010 |
| EPA-PZ-2012-3B | 222.57 | 152.57 - 147.57 | 150.07 | 212.46 | | 212.37 | | 213.14 | | 210.97 | | 212.89 | |
| EPA-PZ-2012-4A | 226.60 | 206.60 - 201.60 | 204.10 | 212.25 | 0.0034 | 212.24 | 0.0006 | 213.14 | 0.0042 | 210.68 | 0.0010 | 212.66 | 0.0024 |
| EPA-PZ-2012-4B | 226.39 | 156.39 - 151.39 | 153.89 | 212.08 | | 212.21 | | 212.93 | | 210.63 | | 212.54 | |
| EPA-PZ-2012-5A | 220.01 | 200.01 - 195.01 | 197.51 | 212.82 | 0.0023 | 212.60 | 0.0008 | 213.10 | -0.0003 | 211.05 | -0.0015 | 212.59 | -0.0012 |
| EPA-PZ-2012-5B | 219.38 | 139.38 - 134.38 | 136.88 | 212.68 | | 212.55 | | 213.12 | | 211.14 | | 212.66 | |
| EPA-PZ-2012-6A | 234.25 | 209.25 - 204.25 | 206.75 | 212.24 | 0.0016 | 212.26 | 0.0010 | 213.18 | 0.0044 | 210.57 | 0.0008 | 212.76 | 0.0014 |
| EPA-PZ-2012-6B | 234.08 | 159.08 - 154.08 | 156.58 | 212.16 | | 212.21 | | 212.96 | | 210.53 | | 212.69 | |
| SHP-2016-1A | 227.27 | 213.37 - 204.27 | 208.82 | 212.38 | 0.0187 | 212.47 | 0.0305 | 213.48 | 0.0268 | 210.42 | 0.0151 | 212.97 | 0.0312 |
| SHP-2016-1B | 227.24 | 152.24 - 142.24 | 147.24 | 211.23 | | 210.59 | | 211.83 | | 209.49 | | 211.05 | |
| SHP-2016-2A | 225.93 | 205.93 - 200.93 | 203.43 | 212.28 | 0.0003 | 212.78 | 0.0008 | 213.00 | 0.0008 | 210.52 | 0.0143 | 212.66 | 0.0010 |
| SHP-2016-2B | 225.95 | 145.95 - 140.95 | 143.45 | 212.26 | | 212.73 | | 212.95 | | 209.66 | | 212.60 | |
| SHP-2016-3A | 223.18 | 203.18 - 198.18 | 200.68 | 212.26 | -0.0010 | 212.08 | -0.0025 | 213.04 | 0.0012 | 210.68 | -0.0022 | 212.37 | -0.0043 |
| SHP-2016-3B | 223.18 | 143.18 - 138.18 | 140.68 | 212.32 | | 212.23 | | 212.97 | | 210.81 | | 212.63 | |
| SHP-2016-4A | 229.97 | 204.97 - 199.97 | 202.47 | 212.19 | -0.0007 | 212.17 | -0.0003 | 213.04 | 0.0005 | 205.14 | -0.0915 | 212.56 | -0.0010 |
| SHP-2016-4B | 229.75 | 144.75 - 139.75 | 142.25 | 212.23 | | 212.19 | | 213.01 | | 210.65 | | 212.62 | |
| SHP-2016-5A | 227.01 | 202.01 - 197.01 | 199.51 | 212.29 | 0.0007 | 212.21 | 0.0008 | 213.08 | 0.0010 | 210.91 | 0.0040 | 212.66 | 0.0000 |
| SHP-2016-5B | 226.95 | 141.95 - 136.95 | 139.45 | 212.25 | | 212.16 | | 213.02 | | 210.67 | | 212.66 | |
| SHM-05-42A | 216.81 | 176.81 - 174.81 | 175.81 | 212.38 | 0.0033 | 212.29 | 0.0057 | 212.78 | -0.0010 | 208.76 | -0.0180 | NM | NA |
| SHM-05-42B | 216.80 | 146.80 - 144.80 | 145.80 | 212.28 | | 212.12 | | 212.81 | | 209.30 | | NM | |
| SHM-96-5B | 218.92 | 138.92 - 128.92 | 133.92 | 212.84 | 0.0020 | 212.82 | -0.0003 | 213.42 | NA | 211.43 | -0.0003 | 213.13 | NA |
| SHM-96-5C | 218.39 | 168.39 - 158.39 | 163.39 | 212.90 | | 212.81 | | NM | | 211.42 | | NM | |
| SHP-05-45A | 228.48 | 208.48 - 203.48 | 205.98 | 212.40 | 0.0034 | 212.36 | 0.0030 | 213.27 | 0.0006 | 210.75 | 0.0013 | NM | NA |
| SHP-05-45B | 229.11 | 164.11 - 154.11 | 159.11 | 212.24 | | 212.22 | | 213.24 | | 210.69 | | NM | |
| SHP-05-46A | 228.18 | 208.18 - 203.18 | 205.68 | 212.76 | -0.0021 | 213.29 | 0.0089 | 213.72 | -0.0010 | 211.23 | -0.0015 | NM | NA |
| SHP-05-46B | 227.60 | 162.60 - 152.60 | 157.60 | 212.86 | | 212.86 | | 213.77 | | 211.30 | | NM | |

**Notes:**
[1]Data for EPA-PZ-2012-5A and -5B shown for 5/18/2020 were recorded on 5/22/2020.
NA = Not Available (data for one or both groundwater elevations is missing from the well pair)
NM = Not measured
ft = feet
Elevations shown are in North American Vertical Datum of 1988 (NAVD 88).
Negative vertical gradient implies upward flow potential and positive vertical gradient implies downward flow potential.

**Table 3**
**Range of Hydraulic Vectors Near Extraction Wells**
**2021 Technical Memo**
**Shepley's Hill Landfill, Former Fort Devens Army Installation, Massachusetts**

| Triangle Number | Well Identification | Average Hydraulic Gradient 2016-2020 | | Average Fall Hydraulic Gradient 2016-2020 | | Average Spring Hydraulic Gradient 2016-2020 | | Minimum Hydraulic Gradient 2016-2020 | | Maximum Hydraulic Gradient 2016-2020 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Magnitude | Direction (degrees) | Magnitude | Direction (degrees) | Magnitude | Direction (degrees) | Magnitude | Direction (degrees) | Magnitude | Direction (degrees) |
| 1 | SHP-05-46B<br>EPA-PZ-2012-4B<br>SHP-05-45B | 0.0114 | 280 | 0.0117 | 277 | 0.0106 | 285 | 0.0089 | 267 | 0.0140 | 291 |
| 2 | EPA-PZ-2012-3B<br>EPA-PZ-2012-4B<br>SHP-05-46B | 0.0078 | 302 | 0.0076 | 301 | 0.0082 | 302 | 0.0062 | 296 | 0.0093 | 313 |
| 3 | EPA-PZ-2012-1B<br>EPA-PZ-2012-3B<br>SHP-05-46B | 0.0059 | 310 | 0.0060 | 305 | 0.0057 | 313 | 0.0049 | 302 | 0.0064 | 327 |
| 4 | EPA-PZ-2012-3B<br>EPA-PZ-2012-5B<br>SHM-96-5B | 0.0062 | 303 | 0.0062 | 298 | 0.0058 | 303 | 0.0051 | 293 | 0.0076 | 325 |
| 5 | EPA-PZ-2012-1B<br>EPA-PZ-2012-3B<br>SHM-96-5B | 0.0052 | 295 | 0.0056 | 291 | 0.0050 | 296 | 0.0045 | 281 | 0.0058 | 314 |
| 6 | EPA-PZ-2012-1B<br>EPA-PZ-2012-2B<br>SHM-96-5B | 0.0046 | 315 | 0.0048 | 309 | 0.0045 | 316 | 0.0039 | 296 | 0.0053 | 337 |
| 7 | EPA-PZ-2012-5B<br>EPA-PZ-2012-2B<br>SHM-96-5B | 0.0048 | 317 | 0.0048 | 310 | 0.0046 | 317 | 0.0039 | 301 | 0.0068 | 338 |
| 8 | EPA-PZ-2012-1B<br>SHP-05-46B<br>SHM-10-06 | 0.0091 | 312 | 0.0086 | 311 | 0.0093 | 313 | 0.0079 | 293 | 0.0134 | 326 |
| 9 | EPA-PZ-2012-3B<br>EPA-PZ-2012-5B<br>SHP-2016-3B | 0.0024 | 290 | 0.0024 | 274 | 0.0023 | 291 | 0.0016 | 269 | 0.0031 | 351 |
| 10 | EPA-PZ-2012-5B<br>SHP-2016-3B<br>SHM-05-42B | 0.0029 | 285 | 0.0036 | 286 | 0.0021 | 279 | 0.0014 | 262 | 0.0081 | 340 |
| 11 | EPA-PZ-2012-1B<br>SHM-10-06<br>SHM-10-06A | 0.0073 | 295 | 0.0072 | 264 | 0.0072 | 269 | 0.0060 | 10 | 0.0078 | 343 |
| 12 | EPA-PZ-2012-1B<br>EPA-PZ-2012-2B<br>SHM-10-06A | 0.0072 | 317 | 0.0070 | 313 | 0.0069 | 317 | 0.0048 | 298 | 0.0080 | 332 |
| 13 | EPA-PZ-2012-3B<br>EPA-PZ-2012-4B<br>SHP-2016-5B | 0.0039 | 233 | 0.0039 | 239 | 0.0039 | 229 | 0.0021 | 217 | 0.0048 | 268 |

**Table 3**
**Range of Hydraulic Vectors Near Extraction Wells**
**2021 Technical Memo**
**Shepley's Hill Landfill, Former Fort Devens Army Installation, Massachusetts**

| Triangle Number | Well Identification | Average Hydraulic Gradient 2016-2020 | | Average Fall Hydraulic Gradient 2016-2020 | | Average Spring Hydraulic Gradient 2016-2020 | | Minimum Hydraulic Gradient 2016-2020 | | Maximum Hydraulic Gradient 2016-2020 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Magnitude | Direction (degrees) | Magnitude | Direction (degrees) | Magnitude | Direction (degrees) | Magnitude | Direction (degrees) | Magnitude | Direction (degrees) |
| 14 | SHP-2016-2B<br>SHP-2016-3B<br>SHP-2016-4B | 0.0044 | 248 | 0.0074 | 252 | ***0.0009*** | 217 | ***0.0005*** | 5 | 0.0228 | 342 |
| 15 | EPA-PZ-2012-3B<br>SHP-2016-3B<br>SHP-2016-5B | 0.0024 | 288 | 0.0025 | 272 | 0.0023 | 293 | 0.0016 | 267 | 0.0030 | 331 |
| 16 | EPA-PZ-2012-4B<br>EPA-PZ-2012-6B<br>SHP-2016-1B | 0.0152 | 194 | 0.0154 | 195 | 0.0142 | 194 | 0.0093 | 191 | 0.0212 | 199 |
| 17 | SHP-2016-2B<br>SHP-2016-3B<br>SHM-05-42B | 0.0031 | 223 | 0.0046 | 235 | ***0.0007*** | 213 | ***0.0005*** | 1 | 0.0141 | 307 |
| 18 | SHP-2016-3B<br>SHP-2016-4B<br>SHP-2016-5B | 0.0011 | 206 | 0.0015 | 205 | ***0.0010*** | 179 | ***0.0002*** | 17 | 0.0019 | 338 |
| 19 | EPA-PZ-2012-4B<br>SHP-2016-1B<br>SHP-05-45B | 0.0211 | 273 | 0.0215 | 271 | 0.0214 | 275 | 0.0160 | 267 | 0.0270 | 281 |
| 20 | EPA-PZ-2012-6B<br>SHP-2016-4B<br>SHP-2016-5B | 0.0012 | 210 | 0.0014 | 182 | ***0.0010*** | 208 | ***0.0005*** | 72 | 0.0018 | 350 |
| 21 | EPA-PZ-2012-6B<br>SHP-2016-5B<br>EPA-PZ-2012-4B | 0.0016 | 168 | 0.0017 | 164 | 0.0015 | 186 | ***0.0005*** | 15 | 0.0027 | 231 |
| 22 | EPA-PZ-2012-7B<br>SHP-2016-4B<br>EPA-PZ-2012-6B | 0.0013 | 160.49 | 0.0017 | 197 | ***0.0010*** | 124 | ***0.0005*** | 181 | 0.0023 | 282 |

**Notes:**
1. Hydraulic gradient and groundwater velocity calculated using 3PE Interactive spreadsheet analysis tool
2. Direction measured clockwise from 0 to 360 degrees.
3. Grey shaded triangles are closest to the extraction wells
4. Gradients less than or equal to 0.001 are bolded and italicized.

**Table 4**
**Fall 2020 LTM Analytical Results and Field Parameters**
**2021 Technical Memo**
**Shepley's Hill Landfill, Former Fort Devens Army Installation, Massachusetts**

| | | | Analytical Method | Dissolved Metals | | | | | | Anions | | | | General Chemistry | | | | Field Parameters | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Analyte | Arsenic | | Iron | | Manganese | | Alkalinity | | Chloride | | DOC | | Sulfate | | DO | ORP | pH | SPC | Temp | Turbidity | |
| | | | Unit | µg/L | | µg/L | | µg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | mv | SU | µS/cm | °C | NTU | |
| | | | Screening Limit * | 10 | | 9,100 | | 1,715 | | | | | | | | | | | | | | | | |
| Location | Sample ID | Groundwater Elevation (ft NAVD 88) 11/4/2020 | Date | | | | | | | | | | | | | | | | | | | | | |
| EPA-PZ-2012-1A | EPA-PZ-2012-1A-FAL20 | 211.52 | 10/30/2020 | 3.0 | U | 140 | | 170 | | 39 | | 3.7 | | 1.8 | U | 1.8 | | 0.78 | 88.8 | 6.59 | 81 | 7.2 | 37.2 | |
| EPA-PZ-2012-1B | EPA-PZ-2012-1B-FAL20 | 211.60 | 10/30/2020 | 3.6 | | 5,800 | | 790 | | 74 | | 48 | | 7.5 | | 1.7 | | 0.89 | 72.4 | 6.38 | 431 | 6.7 | 8.77 | |
| EPA-PZ-2012-2A | EPA-PZ-2012-2A-FAL20 | 211.87 | 11/05/2020 | 3.0 | U | 50 | U | 1.5 | J | 13 | | 6.9 | | 1.0 | U | 6.2 | | 5.79 | 264 | 5.55 | 47 | 12.4 | 1.90 | |
| EPA-PZ-2012-2B | EPA-PZ-2012-2B-FAL20 | 211.86 | 11/05/2020 | 3.0 | U | 4,300 | | **6,000** | | 130 | | 45 | | 1.4 | U | 10 | | 0.81 | 54.2 | 5.93 | 288 | 12.4 | 12.4 | |
| EPA-PZ-2012-3A | EPA-PZ-2012-3A-FAL20 | 210.89 | 11/02/2020 | **12** | | **13,000** | | 720 | | 97 | | 27 | | 9.8 | | 1.0 | U | 0.92 | 223 | 5.76 | 195 | 10.6 | 8.40 | |
| EPA-PZ-2012-3B | EPA-PZ-2012-3B-FAL20 | 210.87 | 11/02/2020 | **2,700** | | **37,000** | | **5,300** | | 170 | | 29 | | 1.4 | | 16 | | 0.88 | 131 | 6.42 | 311 | 9.5 | 35.5 | |
| EPA-PZ-2012-4A | EPA-PZ-2012-4A-FAL20 | 210.60 | 10/30/2020 | **210** | | **11,000** | | **8,000** | | 170 | | 35 | | 1.8 | U | 18 | | 2.95 | 9.1 | 6.47 | 282 | 7.3 | 10.2 | |
| EPA-PZ-2012-4B | EPA-PZ-2012-4B-FAL20 | 210.49 | 10/29/2020 | **2,000** | | **59,000** | | 780 | | 140 | | 28 | | 2.6 | | 12 | | 3.51 | 5.4 | 6.46 | 468 | 9.1 | 33.3 | |
| EPA-PZ-2012-4B (FD) | SHL-DUP05-FAL20 | 210.49 | 10/29/2020 | **1,900** | | **57,000** | | 760 | | 160 | | 28 | | 2.0 | | 12 | | -- | -- | -- | -- | -- | -- | |
| EPA-PZ-2012-5A | EPA-PZ-2012-5A-FAL20 | 210.96 | 11/10/2020 | 3.0 | U | 5,800 | J | 87 | | 22 | | 15 | | 6.3 | | 4.4 | | 0.59 | 103 | 5.37 | 81 | 13.1 | 12.1 | |
| EPA-PZ-2012-5B | EPA-PZ-2012-5B-FAL20 | 211.06 | 11/10/2020 | 2.5 | J | 230 | | **9,000** | | 180 | | 42 | | 1.5 | | 11 | | 0.82 | 74.7 | 6.17 | 333 | 13.2 | 9.60 | |
| EPA-PZ-2012-6A | EPA-PZ-2012-6A-FAL20 | 210.55 | 11/11/2020 | 3.0 | U | 50 | U | 3.0 | U | 38 | | 9.3 | | 0.97 | J | 3.9 | | 7.13 | 65.7 | 6.40 | 116 | 16.8 | 4.23 | |
| EPA-PZ-2012-6B | EPA-PZ-2012-6B-FAL20 | 210.45 | 11/11/2020 | **300** | | **16,000** | | 970 | | 42 | | 3.7 | | 1.3 | | 2.8 | | 0.46 | -1.6 | 6.45 | 150 | 15.4 | 2.34 | |
| EPA-PZ-2012-7A | EPA-PZ-2012-7A-FAL20 | 210.58 | 11/06/2020 | 3.0 | U | 200 | | 3.0 | J | 24 | | 100 | | 1.0 | U | 8.2 | | 4.94 | 123 | 7.97 | 375 | 12.7 | 3.24 | |
| EPA-PZ-2012-7B | EPA-PZ-2012-7B-FAL20 | 210.58 | 11/06/2020 | **1,300** | | **21,000** | | **2,500** | | 52 | | 1.4 | | 1.1 | U | 2.8 | | 0.46 | 44.4 | 8.12 | 145 | 12.6 | 3.48 | |
| EW-01 | EW-01-FAL20 | NM | 10/30/2020 | **1,400** | | **56,000** | | **1,800** | | 210 | | 18 | | 4.1 | | 4.8 | | 1.05 | 96.1 | 6.50 | 505 | 9.9 | 4.23 | |
| EW-04 | EW-04-FAL20 | NM | 10/30/2020 | **3,000** | | **33,000** | | **2,100** | | 100 | | 6.7 | | 1.9 | U | 4.5 | | 2.11 | 74.7 | 6.76 | 264 | 6.7 | 6.18 | |
| N5-P1 | N5-P1-FAL20 | 217.95 | 10/30/2020 | **520** | | 510 | | 980 | | 130 | | 19 | | 1.2 | U | 17 | | 0.68 | -38.3 | 6.78 | 171 | 9.1 | 6.00 | |
| PZ-12-01 | PZ-12-01-FAL20 | 216.75 | 11/02/2020 | **600** | | **52,000** | | **1,900** | | 160 | | 57 | | 1.9 | | 19 | | 0.63 | 10.7 | 6.81 | 527 | 9.2 | 11.7 | |
| PZ-12-02 | PZ-12-02-FAL20 | 216.98 | 11/02/2020 | **270** | | **64,000** | | 1,100 | | 200 | | 64 | | 3.0 | | 1.0 | U | 0.69 | -8.5 | 6.56 | 621 | 10.2 | 1.96 | |
| PZ-12-03 | PZ-12-03-FAL20 | 216.85 | 11/02/2020 | **720** | | **50,000** | | **3,300** | | 170 | | 47 | | 1.7 | | 3.0 | | 0.37 | -17.6 | 6.63 | 504 | 8.5 | 30.0 | |
| PZ-12-04 | PZ-12-04-FAL20 | 217.49 | 11/02/2020 | **710** | | **75,000** | | **1,900** | | 160 | | 61 | | 2.3 | U | 1.0 | U | 0.52 | -2.3 | 6.50 | 572 | 8.2 | 24.2 | |
| PZ-12-05 | PZ-12-05-FAL20 | 216.95 | 11/03/2020 | **140** | | **38,000** | | **3,500** | | 120 | | 12 | | 2.3 | U | 7.0 | | 0.91 | 43.8 | 6.51 | 277 | 9.4 | 3.37 | |
| PZ-12-06 | PZ-12-06-FAL20 | 217.74 | 11/03/2020 | **13** | | 7,100 | | **2,400** | | 110 | | 7.5 | | 1.5 | U | 23 | | 0.60 | 58.9 | 6.24 | 243 | 10.3 | 3.11 | |
| PZ-12-07 | PZ-12-07-FAL20 | 216.84 | 11/05/2020 | **110** | | 3,800 | | 1,100 | | 87 | | 2.2 | | 1.4 | U | 50 | | 3.85 | 100 | 7.69 | 241 | 12.9 | 331 | |
| PZ-12-08 | PZ-12-08-FAL20 | 220.38 | 11/05/2020 | **24** | | **17,000** | | 1,700 | | 85 | | 1.1 | | 1.7 | U | 8.8 | | 0.42 | 89.7 | 7.49 | 167 | 13.6 | 29.8 | |
| PZ-12-09 | PZ-12-09-FAL20 | 217.33 | 10/26/2020 | 1.6 | J | 50 | U | 14 | | 110 | | 1.1 | | 0.46 | J | 10 | | 1.39 | 122 | 6.99 | 182 | 9.8 | 39.6 | |
| PZ-12-10 | PZ-12-10-FAL20 | 218.83 | 10/26/2020 | 3.0 | U | 50 | UJ | 3.0 | UJ | 30 | | 0.44 | J | 0.94 | J | 9.7 | | 4.47 | 165 | 6.82 | 71 | 9.2 | 2.43 | |
| SHL-10 | SHL-10-FAL20 | 216.82 | 11/09/2020 | 3.0 | U | 50 | U | 23 | U | 20 | | 1.1 | | 1.7 | U | 4.0 | | 2.27 | 120 | 8.24 | 44 | 16.3 | 1.53 | |
| SHL-11 | SHL-11-FAL20 | 216.80 | 10/29/2020 | **900** | | **48,000** | | **2,000** | | 120 | | 66 | | 2.4 | | 16 | | 0.52 | 21.5 | 6.53 | 534 | 10.6 | 35.8 | |

**Table 4**
**Fall 2020 LTM Analytical Results and Field Parameters**
**2021 Technical Memo**
**Shepley's Hill Landfill, Former Fort Devens Army Installation, Massachusetts**

| | | | Analytical Method | Dissolved Metals | | | | | | Anions | | | | General Chemistry | | | | Field Parameters | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Analyte | Arsenic | | Iron | | Manganese | | Alkalinity | | Chloride | | DOC | | Sulfate | | DO | ORP | pH | SPC | Temp | Turbidity | |
| | | | Unit | µg/L | | µg/L | | µg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | mv | SU | µS/cm | °C | NTU | |
| | | | Screening Limit * | 10 | | 9,100 | | 1,715 | | | | | | | | | | | | | | | | |
| Location | Sample ID | Groundwater Elevation (ft NAVD 88) 11/4/2020 | Date | | | | | | | | | | | | | | | | | | | | | |
| SHL-12 | SHL-12-FAL20 | 225.27 | 11/02/2020 | 2.3 | J | 130 | | 180 | | 63 | | 57 | | 1.7 | U | 90 | | 2.96 | 71.3 | 6.05 | 247 | 8.5 | 6.30 | |
| SHL-15 | SHL-15-FAL20 | 238.92 | 11/02/2020 | **26** | | 4,500 | | 250 | | 100 | | 19 | | 2.8 | | 9.1 | | 0.69 | -1.4 | 5.95 | 161 | 10.7 | 12.1 | |
| SHL-19 | SHL-19-FAL20 | 217.82 | 10/26/2020 | 3.0 | U | 50 | U | 15 | | 88 | | 0.92 | | 1.0 | U | 19 | | 4.35 | 142 | 6.74 | 178 | 9.9 | 15.9 | |
| SHL-20 | SHL-20-FAL20 | 217.15 | 10/29/2020 | **760** | | **52,000** | | **2,100** | | 110 | | 63 | | 1.8 | | 28 | | 3.37 | 17.1 | 6.45 | 513 | 10.4 | 10.7 | |
| SHL-22 | SHL-22-FAL20 | 213.08 | 11/03/2020 | 2.4 | J | 50 | U | **7,700** | | 320 | | 29 | | 1.5 | U | 8.9 | | 1.17 | 97.8 | 6.67 | 352 | 8.7 | 2.40 | |
| SHL-22 (FD) | SHL-DUP07-FAL20 | 213.08 | 11/03/2020 | 2.2 | J | 50 | U | **8,200** | | 320 | | 29 | | 1.4 | U | 8.9 | | -- | -- | -- | -- | -- | -- | |
| SHL-23 | SHL-23-FAL20 | 210.93 | 11/12/2020 | 3.0 | U | 50 | U | 11 | U | 5.8 | J | 4.3 | | 1.6 | | 6.2 | | 10.1 | 200 | 6.52 | 43 | 10.6 | 1.06 | |
| SHL-24 | SHL-24-FAL20 | 222.40 | 10/26/2020 | 3.9 | | 50 | U | 3.0 | U | 50 | | 39 | | 1.0 | U | 24 | | 2.66 | 159 | 6.97 | 202 | 11.4 | 0.02 | U |
| SHL-24 (FD) | SHL-DUP09-FAL20 | 222.40 | 10/26/2020 | 4.1 | | 50 | U | 3.0 | U | 52 | | 39 | | 1.0 | U | 24 | | -- | -- | -- | -- | -- | -- | |
| SHL-3 | SHL-3-FAL20 | 216.40 | 11/09/2020 | 3.0 | U | 50 | U | 10 | U | 61 | | 0.65 | | 1.6 | U | 6.3 | | 3.91 | 130 | 7.58 | 136 | 16.1 | 1.12 | |
| SHL-4 | SHL-4-FAL20 | 216.80 | 11/12/2020 | **110** | | **15,000** | | **2,500** | | 76 | | 1.5 | | 1.6 | | 21 | | 0.80 | -17.2 | 6.00 | 147 | 12.7 | 65.2 | |
| SHL-5 | SHL-5-FAL20 | 211.05 | 11/09/2020 | 4.6 | | 2,100 | | 290 | | 30 | | 13 | | 8.2 | | 1.0 | U | 0.85 | 92.8 | 5.77 | 81 | 15.1 | 33.1 | |
| SHL-7 | SHL-7-FAL20 | 217.78 | 11/03/2020 | 3.0 | U | 700 | | 63 | | 39 | | 73 | | 1.0 | U | 3.0 | | 0.79 | 84.3 | 5.91 | 175 | 9.1 | 8.90 | |
| SHL-8D | SHL-8D-FAL20 | 212.38 | 11/10/2020 | 3.0 | U | 100 | U | 19 | | 21 | | 45 | | 1.0 | U | 7.5 | | 0.66 | 89.0 | 5.94 | 154 | 13.9 | 2.00 | |
| SHL-8S | SHL-8S-FAL20 | 212.41 | 11/10/2020 | 3.0 | U | 70 | U | 7.3 | J | 24 | | 7.2 | | 1.0 | U | 6.1 | | 4.07 | 163 | 5.98 | 66 | 13.3 | 2.30 | |
| SHL-9 | SHL-9-FAL20 | 210.21 | 11/03/2020 | **35** | | 6,200 | | 390 | | 69 | | 50 | | 5.7 | | 1.6 | | 0.83 | 3.6 | 6.52 | 194 | 8.7 | 72.3 | |
| SHM-05-39A | SHM-05-39A-FAL20 | 209.28 | 10/26/2020 | 7.3 | | 150 | | 96 | | 59 | | 26 | | 1.1 | | 5.2 | | 1.71 | 196 | 6.28 | 150 | 12.1 | 33.5 | |
| SHM-05-39B | SHM-05-39B-FAL20 | 208.52 | 10/26/2020 | **420** | | **15,000** | | 760 | | 58 | | 240 | | 1.3 | | 7.8 | | 0.77 | -70.5 | 6.91 | 523 | 10.8 | 11.5 | |
| SHM-05-40X | SHM-05-40X-FAL20 | 208.20 | 11/11/2020 | **2,100** | | **24,000** | | 670 | | 150 | | 11 | | 1.6 | | 3.8 | | 0.45 | 6.4 | 6.36 | 403 | 13.5 | 11.5 | |
| SHM-05-40X (FD) | SHL-DUP10-FAL20 | 208.20 | 11/11/2020 | **2,300** | | **24,000** | | 680 | | 140 | | 11 | | 1.6 | | 3.8 | | -- | -- | -- | -- | -- | -- | |
| SHM-05-41A | SHM-05-41A-FAL20 | 210.47 | 11/06/2020 | **18** | | 4,800 | | 170 | | 36 | | 5.9 | | 1.0 | U | 6.5 | | 0.32 | 19.8 | 8.17 | 104 | 11.8 | 6.25 | |
| SHM-05-41B | SHM-05-41B-FAL20 | 210.65 | 11/06/2020 | **570** | | **35,000** | | 1,100 | | 86 | | 48 | | 1.7 | U | 2.5 | J | 0.46 | 7.9 | 7.67 | 423 | 11.4 | 5.51 | |
| SHM-05-41C | SHM-05-41C-FAL20 | 210.45 | 11/06/2020 | **610** | | **14,000** | | **2,600** | | 350 | | 380 | | 3.2 | | 2.4 | | 0.54 | -19.9 | 7.58 | 1,940 | 13.6 | 3.34 | |
| SHM-05-42A | SHM-05-42A-FAL20 | 210.91 | 11/09/2020 | 3.0 | U | 50 | U | 100 | | 26 | | 7.4 | | 1.1 | U | 7.6 | | 0.68 | 176 | 5.63 | 67 | 12.2 | 15.6 | |
| SHM-05-42B | SHM-05-42B-FAL20 | 210.80 | 11/09/2020 | **160** | | **28,000** | | **6,200** | | 170 | | 38 | | 1.8 | U | 9.4 | | 0.72 | -24.5 | 6.22 | 296 | 12.1 | 6.30 | |
| SHM-07-03 | SHM-07-03-FAL20 | 207.20 | 11/11/2020 | 3.0 | U | 320 | | 8.9 | J | 15 | U | 320 | | 0.87 | J | 11 | | 7.85 | 139 | 5.84 | 1,270 | 14.2 | 12.9 | |
| SHM-07-05X | SHM-07-05X-FAL20 | 208.45 | 11/11/2020 | **83** | | 1,900 | | 140 | | 38 | | 48 | | 2.0 | | 2.7 | | 0.81 | 56.2 | 6.75 | 253 | 18.2 | 27.4 | |
| SHM-10-02 | SHM-10-02-FAL20 | 204.72 | 11/10/2020 | 3.0 | U | 62 | U | **2,000** | | 110 | | 150 | | 1.2 | | 6.3 | | 0.28 | 101 | 6.40 | 608 | 14.8 | 4.02 | |
| SHM-10-03 | SHM-10-03-FAL20 | 205.02 | 11/10/2020 | 1.9 | J | 75 | U | 8.0 | J | 160 | | 110 | | 1.7 | | 7.5 | | 0.52 | 93.5 | 6.80 | 598 | 16.5 | 9.84 | |
| SHM-10-04 | SHM-10-04-FAL20 | 206.09 | 11/12/2020 | 3.0 | U | 50 | U | 280 | J | 63 | | 90 | | 1.2 | | 17 | | 0.73 | 96.0 | 6.03 | 459 | 11.6 | 6.01 | |

**Table 4**
**Fall 2020 LTM Analytical Results and Field Parameters**
**2021 Technical Memo**
**Shepley's Hill Landfill, Former Fort Devens Army Installation, Massachusetts**

| | | | Analytical Method | Dissolved Metals | | | | | | Anions | | | | General Chemistry | | | | Field Parameters | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Analyte | Arsenic | | Iron | | Manganese | | Alkalinity | | Chloride | | DOC | | Sulfate | | DO | ORP | pH | SPC | Temp | Turbidity | |
| | | | Unit | µg/L | | µg/L | | µg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | mv | SU | µS/cm | °C | NTU | |
| | | | Screening Limit * | 10 | | 9,100 | | 1,715 | | | | | | | | | | | | | | | | |
| Location | Sample ID | Groundwater Elevation (ft NAVD 88) 11/4/2020 | Date | | | | | | | | | | | | | | | | | | | | | |
| SHM-10-05A | SHM-10-05A-FAL20 | 209.81 | 11/12/2020 | 2.0 | J | 96 | U | 10 | U | 36 | | 43 | | 0.89 | J | 8.8 | | 1.21 | 158 | 5.64 | 165 | 13.5 | 6.20 | |
| SHM-10-06 | SHM-10-06-FAL20 | 212.60 | 10/30/2020 | **1,000** | | **63,000** | | 1,400 | | 140 | | 33 | | 1.9 | U | 7.8 | | 0.77 | -10.6 | 6.50 | 479 | 8.3 | 28.3 | |
| SHM-10-06A | SHM-10-06A-FAL20 | 212.43 | 11/13/2020 | **71** | | **9,800** | | 1,500 | | 85 | | 20 | | 1.4 | | 4.5 | | 0.82 | 50.0 | 5.59 | 150 | 9.3 | 6.30 | |
| SHM-10-07 | SHM-10-07-FAL20 | 218.97 | 11/10/2020 | **1,000** | | **46,000** | | **2,100** | | 130 | | 70 | | 2.1 | | 7.0 | | 0.41 | -45.4 | 7.74 | 644 | 12.7 | 5.27 | |
| SHM-10-08 | SHM-10-08-FAL20 | 204.58 | 11/10/2020 | 3.0 | U | 53 | U | 340 | | 220 | | 89 | | 1.7 | | 5.2 | | 0.36 | 113 | 6.46 | 656 | 14.7 | 4.65 | |
| SHM-10-10 | SHM-10-10-FAL20 | 206.19 | 11/09/2020 | 3.0 | U | 50 | U | 3.0 | U | 200 | | 64 | | 2.8 | U | 3.9 | | 0.32 | 216 | 6.33 | 5,090 | 16.9 | 2.55 | |
| SHM-10-11 | SHM-10-11-FAL20 | 222.52 | 11/12/2020 | **430** | | **47,000** | | **1,900** | | 130 | | 34 | | 2.5 | | 56 | | 0.19 | 15.9 | 5.97 | 541 | 12.0 | 19.0 | |
| SHM-10-12 | SHM-10-12-FAL20 | 220.47 | 11/11/2020 | **3,400** | | **69,000** | | **5,000** | | 170 | | 2.9 | | 4.1 | | 1.7 | | 0.50 | 53.6 | 5.78 | 394 | 12.3 | 13.1 | |
| SHM-10-13 | SHM-10-13-FAL20 | 217.97 | 10/30/2020 | **430** | | **58,000** | | 1,200 | | 250 | | 31 | | 4.3 | | 1.0 | U | 0.68 | -64.6 | 6.35 | 332 | 8.2 | 12.4 | |
| SHM-10-14 | SHM-10-14-FAL20 | 210.47 | 11/10/2020 | **5,000** | | **86,000** | | **1,900** | | 250 | | 5.1 | | 4.1 | | 1.0 | U | 0.93 | -67.4 | 6.28 | 244 | 6.3 | 10.7 | |
| SHM-10-15 | SHM-10-15-FAL20 | 218.38 | 11/02/2020 | **6,800** | | **44,000** | | **7,300** | | 220 | | 8.1 | | 2.2 | | 8.1 | | 0.85 | -43.6 | 6.34 | 228 | 8.8 | 19.5 | |
| SHM-10-16 | SHM-10-16-FAL20 | 210.60 | 11/12/2020 | **1,100** | | **29,000** | | **2,100** | | 290 | | 26 | | 1.8 | | 3.9 | | 0.87 | -65.4 | 6.22 | 387 | 11.5 | 25.9 | |
| SHM-11-02 | SHM-11-02-FAL20 | 216.83 | 11/03/2020 | **12** | | **11,000** | | 830 | | 250 | | 42 | | 1.3 | U | 0.85 | J | 0.49 | -29.7 | 6.76 | 533 | 9.3 | 14.9 | |
| SHM-11-06 | SHM-11-06-FAL20 | 215.42 | 11/02/2020 | **620** | | **62,000** | **J** | 1,600 | J | 150 | | 55 | | 1.8 | | 9.6 | | 0.46 | 41.3 | 7.16 | 533 | 9.2 | 10.4 | |
| SHM-11-06 (FD) | SHL-DUP03-FAL20 | 215.42 | 11/02/2020 | **680** | | **56,000** | | 1,400 | | 150 | | 55 | | 1.7 | | 9.3 | | -- | -- | -- | -- | -- | -- | |
| SHM-13-01 | SHM-13-01-FAL20 | 204.80 | 11/09/2020 | 3.0 | UJ | 50 | U | 10 | UJ | 20 | | 150 | | 1.2 | U | 8.7 | | 4.26 | 230 | 5.69 | 4690 | 11.8 | 2.95 | |
| SHM-13-02 | SHM-13-02-FAL20 | 205.68 | 11/05/2020 | 3.0 | U | 50 | U | 74 | | 110 | | 41 | | 1.5 | U | 4.4 | | 2.04 | 165 | 6.13 | 245 | 13.5 | 9.40 | |
| SHM-13-03 | SHM-13-03-FAL20 | 206.66 | 10/29/2020 | **83** | | 6,200 | | **7,500** | | 140 | | 64 | | 2.6 | | 3.5 | | 1.15 | 14.4 | 4.93 | 315 | 10.8 | 5.60 | |
| SHM-13-04 | SHM-13-04-FAL20 | 207.37 | 11/06/2020 | **260** | **J** | 2,400 | | 160 | | 36 | | 100 | | 1.0 | U | 10 | | 2.89 | 239 | 6.17 | 290 | 14.7 | 128 | |
| SHM-13-05 | SHM-13-05-FAL20 | 208.18 | 11/06/2020 | 6.4 | | 1,000 | | 1,100 | | 140 | | 38 | | 2.0 | U | 7.9 | | 1.15 | 217 | 6.13 | 134 | 12.4 | 3.70 | |
| SHM-13-06 | SHM-13-06-FAL20 | 206.26 | 11/09/2020 | **2,200** | | **20,000** | | 980 | | 51 | | 120 | | 1.7 | U | 6.7 | | 0.06 | -131 | 6.86 | 5,000 | 16.1 | 14.2 | |
| SHM-13-07 | SHM-13-07-FAL20 | 206.53 | 11/05/2020 | **420** | | **15,000** | | **2,000** | | 44 | | 170 | | 1.0 | U | 8.4 | | 0.85 | -26.3 | 6.35 | 498 | 14.6 | 77.3 | |
| SHM-13-08 | SHM-13-08-FAL20 | 207.22 | 11/10/2020 | **1,000** | | **59,000** | | **2,100** | | 150 | | 72 | | 2.7 | | 5.2 | | 0.27 | -120 | 6.55 | 612 | 18.0 | 15.9 | |
| SHM-13-14D | SHM-13-14D-FAL20 | 206.85 | 10/29/2020 | 3.0 | U | 50 | U | 380 | | 53 | | 120 | | 1.9 | | 15 | | 3.62 | 94.3 | 5.57 | 409 | 10.9 | 14.3 | |
| SHM-13-14S | SHM-13-14S-FAL20 | 206.90 | 10/29/2020 | 1.5 | J | 110 | | 27 | | 87 | | 120 | | 1.8 | | 7.3 | | 0.67 | 158 | 5.83 | 305 | 11.4 | 5.90 | |
| SHM-13-15 | SHM-13-15-FAL20 | 206.55 | 10/29/2020 | 7.1 | | 1,200 | | **4,300** | | 320 | | 42 | | 2.5 | | 5.4 | | 0.67 | 14.5 | 6.56 | 394 | 11.2 | 12.7 | |
| SHM-93-10D | SHM-93-10D-FAL20 | 217.30 | 11/11/2020 | 3.0 | U | 490 | | 9.9 | J | 53 | | 30 | | 1.2 | | 18 | | 1.08 | -122 | 11.20 | 275 | 19.4 | 15.7 | |
| SHM-93-18B | SHM-93-18B-FAL20 | 218.06 | 11/12/2020 | 3.0 | U | 50 | U | 450 | | 49 | | 140 | | 0.83 | J | 34 | | 0.69 | 216 | 5.86 | 392 | 12.6 | 8.50 | |
| SHM-93-22B | SHM-93-22B-FAL20 | 209.66 | 11/03/2020 | **300** | | **12,000** | | **9,000** | | 220 | | 34 | | 1.4 | U | 7.8 | | 0.90 | -24.2 | 6.45 | 322 | 9.1 | 42.0 | |
| SHM-93-22C | SHM-93-22C-FAL20 | 209.34 | 11/03/2020 | 4.4 | | 50 | U | 10 | U | 120 | | 20 | | 2.8 | U | 5.1 | | 2.46 | -13.9 | 7.52 | 192 | 9.2 | 4.20 | |

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**Shepley's Hill Landfill, Former Fort Devens Army Installation, Massachusetts**

| | | | Analytical Method | Dissolved Metals | | | | | | Anions | | | | General Chemistry | | | | Field Parameters | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Analyte | Arsenic | | Iron | | Manganese | | Alkalinity | | Chloride | | DOC | | Sulfate | | DO | ORP | pH | SPC | Temp | Turbidity | |
| | | | Unit | µg/L | | µg/L | | µg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | mv | SU | µS/cm | °C | NTU | |
| | | | Screening Limit * | 10 | | 9,100 | | 1,715 | | | | | | | | | | | | | | | | |
| Location | Sample ID | Groundwater Elevation (ft NAVD 88) 11/4/2020 | Date | | | | | | | | | | | | | | | | | | | | | |
| SHM-93-24A | SHM-93-24A-FAL20 | 221.74 | 10/26/2020 | 3.0 | U | 50 | U | 6.4 | J | 25 | | 190 | | 0.68 | J | 55 | | 8.09 | 257 | 5.86 | 460 | 12.0 | 2.99 | |
| SHM-96-5B | SHM-96-5B-FAL20 | 211.29 | 11/10/2020 | **720** | | 8,600 | | **7,900** | | 210 | | 35 | | 1.6 | | 16 | | 1.07 | 2.6 | 6.17 | 324 | 12.0 | 124 | |
| SHM-96-5B (FD) | SHL-DUP08-FAL20 | 211.29 | 11/10/2020 | **640** | | 8,000 | | **7,900** | | 210 | | 35 | | 1.7 | | 16 | | -- | -- | -- | -- | -- | -- | |
| SHM-96-5C | SHM-96-5C-FAL20 | 211.31 | 11/10/2020 | **29** | | 7,500 | | **9,700** | | 200 | | 31 | | 2.4 | | 6.4 | | 0.69 | 8.4 | 6.27 | 335 | 13.1 | 12.6 | |
| SHM-99-31A | SHM-99-31A-FAL20 | 212.67 | 11/02/2020 | **20** | | 7,600 | | 270 | | 14 | U | 20 | | 3.9 | | 7.4 | | 0.99 | 266 | 5.58 | 86 | 8.2 | 14.6 | |
| SHM-99-31B | SHM-99-31B-FAL20 | 209.82 | 10/30/2020 | 1.9 | J | 17 | J | 1.5 | J | 35 | | 8.8 | | 2.3 | | 4.7 | | 6.46 | 97.6 | 6.78 | 77 | 6.7 | 5.30 | |
| SHM-99-31C | SHM-99-31C-FAL20 | 209.73 | 10/30/2020 | **140** | | **12,000** | | **4,600** | | 230 | | 31 | | 1.9 | U | 4.7 | | 1.10 | -37.1 | 6.61 | 31 | 6.7 | 4.60 | |
| SHM-99-32X | SHM-99-32X-FAL20 | 210.86 | 10/30/2020 | **26** | | 4,200 | | **2,800** | | 58 | | 72 | | 1.2 | U | 11 | | 1.06 | -36.1 | 6.63 | 241 | 8.8 | 11.4 | |
| SHP-01-36X | SHP-01-36X-FAL20 | 216.60 | 11/11/2020 | 6.6 | | 530 | | 49 | | 33 | | 74 | | 2.9 | | 8.6 | | 0.97 | 46.3 | 6.42 | 232 | 13.6 | 2.70 | |
| SHP-01-37X | SHP-01-37X-FAL20 | 216.75 | 11/11/2020 | 6.1 | | 430 | | 53 | | 25 | | 75 | | 3.7 | | 8.3 | | 3.38 | 44.9 | 6.66 | 247 | 15.4 | 3.20 | |
| SHP-01-38A | SHP-01-38A-FAL20 | 216.90 | 11/11/2020 | **150** | | **24,000** | | **2,200** | | 90 | | 14 | | 1.4 | | 8.0 | | 0.88 | 29.6 | 5.82 | 191 | 15.0 | 7.10 | |
| SHP-01-38A (FD) | SHL-DUP04-FAL20 | 216.90 | 11/11/2020 | **140** | | **25,000** | | **2,300** | | 91 | | 14 | | 1.4 | | 8.1 | | -- | -- | -- | -- | -- | -- | |
| SHP-2016-06A | SHP-2016-06A-FAL20 | 211.92 | 11/12/2020 | **640** | | 340 | | 1,000 | | 150 | | 4.9 | | 3.3 | | 41 | | 0.44 | 2.8 | 8.27 | 399 | 11.9 | 3.15 | |
| SHP-2016-06B | SHP-2016-06B-FAL20 | 217.24 | 11/12/2020 | **1,100** | | 240 | | 550 | | 160 | | 3.6 | | 4.8 | | 76 | | 0.45 | -7.5 | 8.70 | 501 | 10.2 | 7.22 | |
| SHP-2016-06C | SHP-2016-06C-FAL20 | 217.57 | 11/12/2020 | **350** | | 150 | | 180 | | 130 | | 1.5 | | 1.0 | U | 9.4 | | 0.36 | -7.8 | 8.98 | 256 | 9.6 | 7.13 | |
| SHP-2016-07B | SHP-2016-07B-FAL20 | 229.79 | 11/13/2020 | **65** | | 460 | | 580 | | 110 | | 2.6 | | 1.6 | | 30 | | 1.38 | -13.5 | 7.05 | 174 | 8.4 | 42.1 | |
| SHP-2016-07B (FD) | SHL-DUP06-FAL20 | 229.79 | 11/13/2020 | **71** | | 500 | | 610 | | 130 | | 2.7 | | 1.8 | | 33 | | -- | -- | -- | -- | -- | -- | |

**Table 4**
**Fall 2020 LTM Analytical Results and Field Parameters**
**2021 Technical Memo**
**Shepley's Hill Landfill, Former Fort Devens Army Installation, Massachusetts**

| | | | Analytical Method | Dissolved Metals | | | | | | Anions | | | | General Chemistry | | | | Field Parameters | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Analyte | Arsenic | | Iron | | Manganese | | Alkalinity | | Chloride | | DOC | | Sulfate | | DO | ORP | pH | SPC | Temp | Turbidity | |
| | | | Unit | µg/L | | µg/L | | µg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | mv | SU | µS/cm | °C | NTU | |
| | | | Screening Limit * | 10 | | 9,100 | | 1,715 | | | | | | | | | | | | | | | | |
| Location | Sample ID | Groundwater Elevation (ft NAVD 88) 11/4/2020 | Date | | | | | | | | | | | | | | | | | | | | | |
| SHP-2016-1A | SHP-2016-1A-FAL20 | 210.65 | 11/05/2020 | 3.0 | U | 240 | | 6.6 | J | 16 | | 0.53 | | 1.0 | U | 4.5 | | 3.52 | 101 | 7.64 | 45 | 12.9 | 8.48 | |
| SHP-2016-1B | SHP-2016-1B-FAL20 | 208.14 | 11/05/2020 | **140** | | **24,000** | | 1,100 | | 91 | | 5 | | 1.8 | U | 2.6 | | 0.30 | 45.5 | 7.46 | 207 | 12.5 | 6.62 | |
| SHP-2016-2A | SHP-2016-2A-FAL20 | 210.65 | 11/06/2020 | 8.5 | | 120 | U | 290 | | 57 | | 2.2 | | 1.0 | U | 3.6 | | 2.87 | 7.2 | 8.74 | 81 | 11.6 | 5.00 | |
| SHP-2016-2B | SHP-2016-2B-FAL20 | 210.65 | 11/06/2020 | **520** | | **43,000** | | **2,400** | | 10 | U | 14 | | 1.8 | U | 3.2 | | 0.78 | -78.2 | 6.51 | 269 | 10.4 | 4.60 | |
| SHP-2016-3A | SHP-2016-3A-FAL20 | 211.66 | 11/02/2020 | 5.3 | | **14,000** | | 670 | | 55 | | 14 | | 1.3 | | 1.7 | | 1.17 | 151 | 6.53 | 97 | 6.6 | 3.40 | |
| SHP-2016-3B | SHP-2016-3B-FAL20 | 210.71 | 11/03/2020 | **180** | | **29,000** | | **2,200** | | 110 | | 5.9 | | 1.9 | U | 1.8 | | 1.01 | -43.9 | 6.30 | 151 | 7.3 | 11.8 | |
| SHP-2016-4A | SHP-2016-4A-FAL20 | 210.80 | 11/06/2020 | 3.0 | U | 50 | U | 110 | | 17 | | 4.2 | | 1.0 | U | 4.6 | | 4.27 | 148 | 6.19 | 40 | 10.3 | 7.20 | |
| SHP-2016-4B | SHP-2016-4B-FAL20 | 210.30 | 11/06/2020 | **1,700** | | **48,000** | | **2,600** | | 160 | | 22 | | 1.7 | U | 5.1 | | 0.87 | -69.6 | 6.43 | 305 | 10.1 | 6.50 | |
| SHP-2016-5A | SHP-2016-5A-FAL20 | 210.66 | 11/09/2020 | 3.9 | | 2,200 | | 200 | | 56 | | 39 | | 5.5 | | 2.7 | | 0.72 | -5.1 | 6.40 | 157 | 11.2 | 2.79 | |
| SHP-2016-5B | SHP-2016-5B-FAL20 | 210.57 | 11/09/2020 | **730** | | **57,000** | | **2,600** | | 160 | | 25 | | 2.7 | U | 9.6 | | 0.76 | -87.7 | 6.56 | 339 | 12.8 | 2.10 | |
| SHP-99-29X | SHP-99-29X-FAL20 | 217.49 | 11/02/2020 | **2,300** | | **44,000** | | **5,500** | | 100 | | 2.3 | | 2.4 | | 3.2 | | 1.50 | 0.2 | 5.92 | 118 | 7.9 | 67.9 | |

**Notes:**

*Screening Limits: Shepley's Hill Landfill (SHL) Cleanup Goals

Screening Limits Source: USACE. 1995. Record of Decision, Shepley's Hill Landfill Operable Unit, Fort Devens, Massachusetts. September.

**Acronyms and Abbreviations:**

| | | | |
|---|---|---|---|
| -- | no data available | mg/L | milligram per liter |
| °C | degrees Celsius | mV | millivolt |
| µg/L | microgram per liter | NTU | Nephelometric Turbidity Unit |
| µS/cm | microsiemen per centimeter | ORP | oxidation-reduction potential |
| DO | dissolved oxygen | SPC | specific conductivity |
| DOC | dissolved organic carbon | SU | standard unit |
| FD | field duplicate | Temp | temperature |
| LTM | long-term monitoring | NM | Not measured |
| NAVD 88 | North American Vertical Datum 1988 | | |

**Analytical Parameters:**

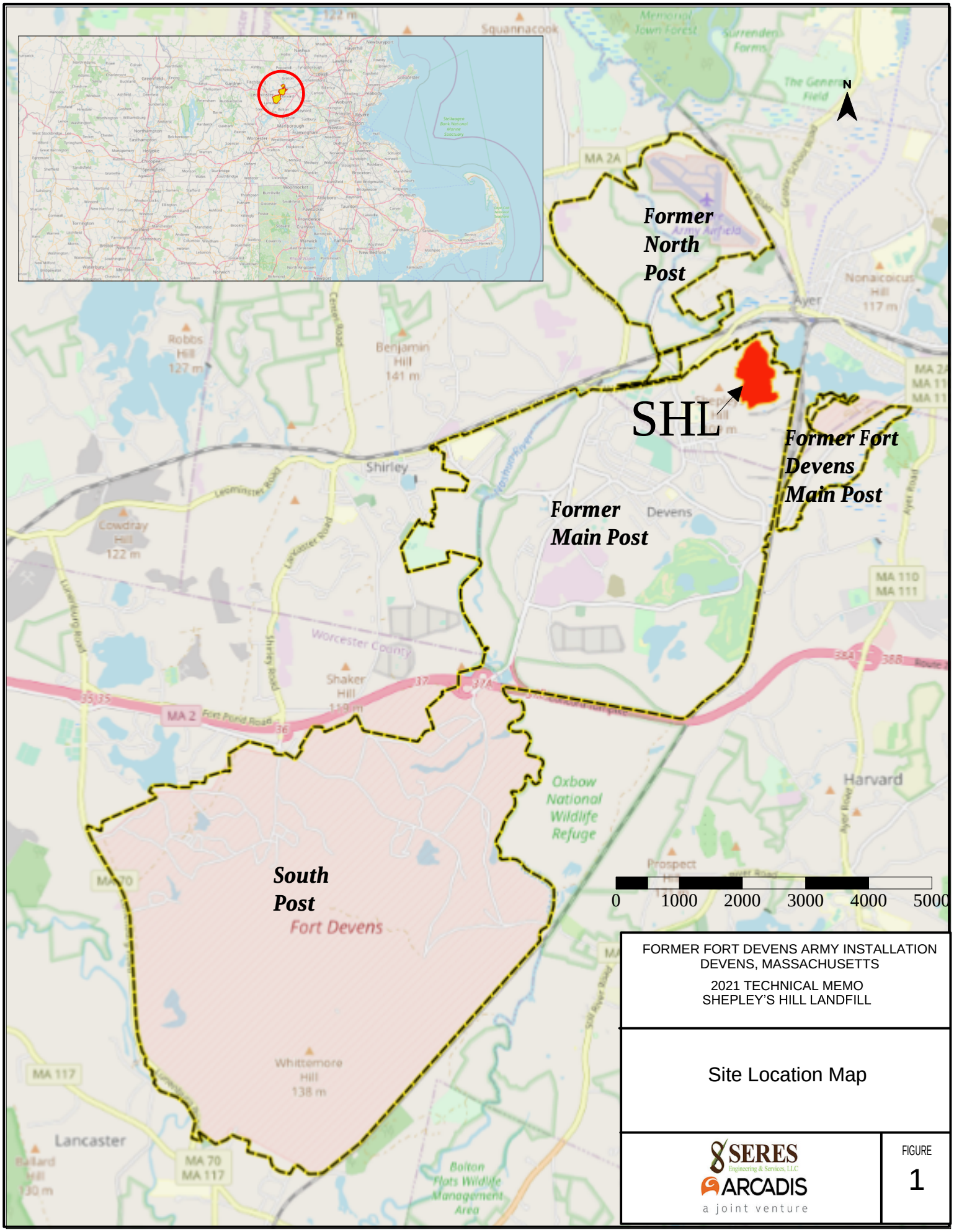
# =Above Cleanup Goal

**Qualifiers**

J The analyte was positively identified, the quantitation is an estimation.

U The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

# Figures




FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS

2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

Site Location Map

SERES Engineering & Services, LLC
ARCADIS
a joint venture

FIGURE
1

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS

2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

Site Plan

SERES
ARCADIS
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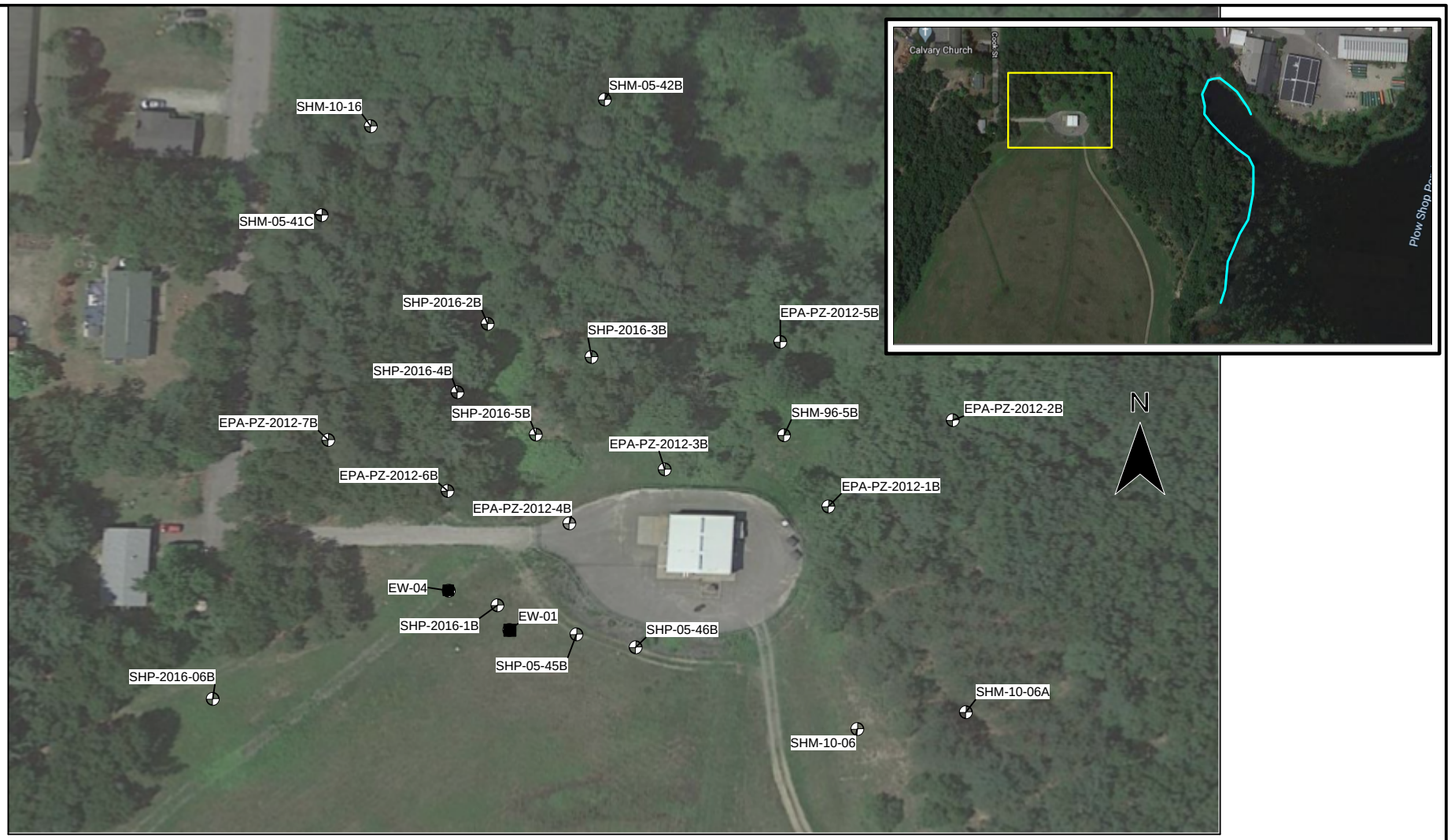
FIGURE
2

Ft
0 1000 2000




## Legend

- Extraction Wells
- Monitoring Wells
- Plow Shop Pond
- Location of Interest

Scale in feet

0 120 240

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

**Well Location Map**

SERES Engineering & Services, LLC
ARCADIS
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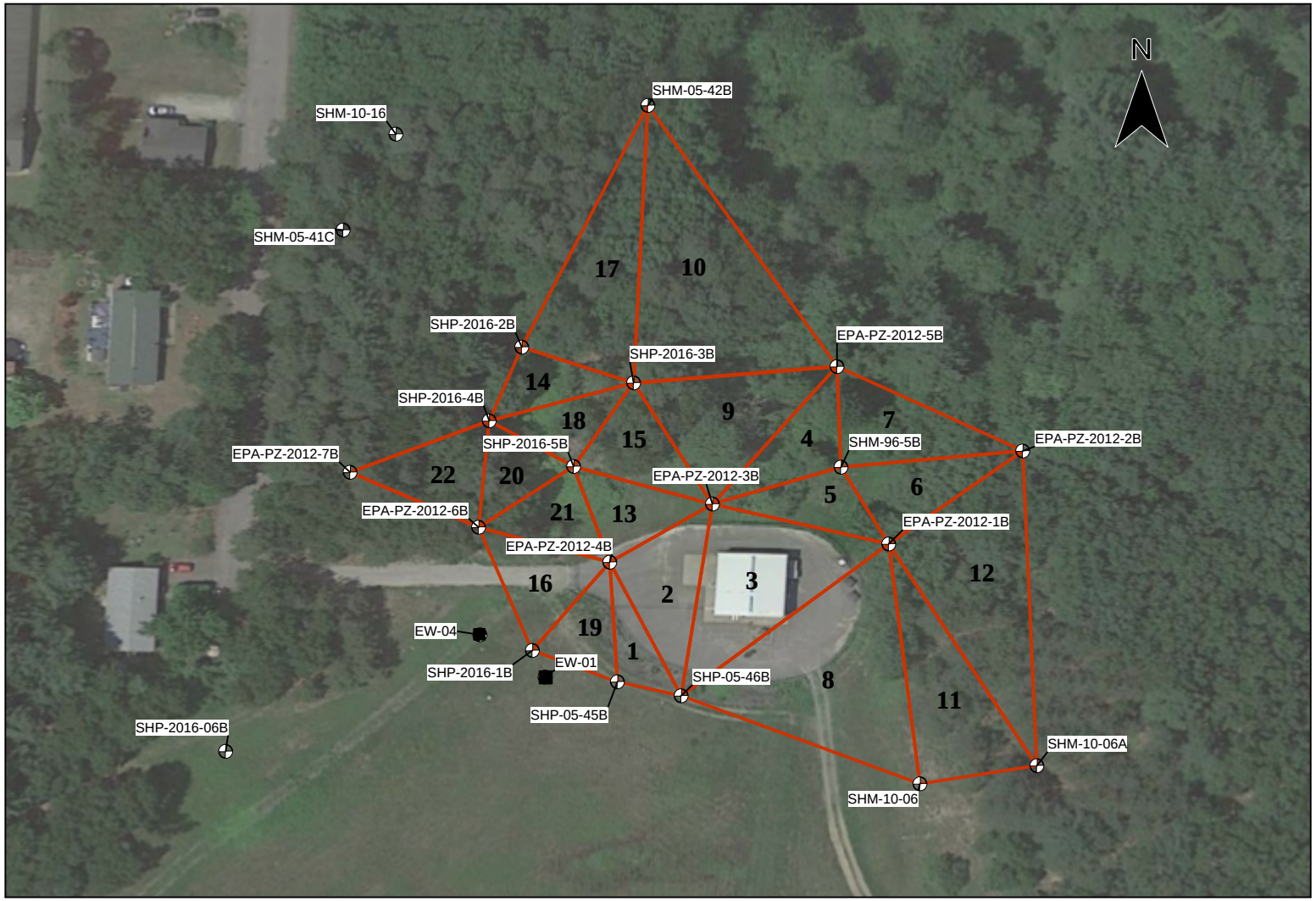
FIGURE
3




## Legend

- Extraction Wells
- Monitoring Wells

Scale in feet

0 120 240

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

**Triangle Well Array Map**

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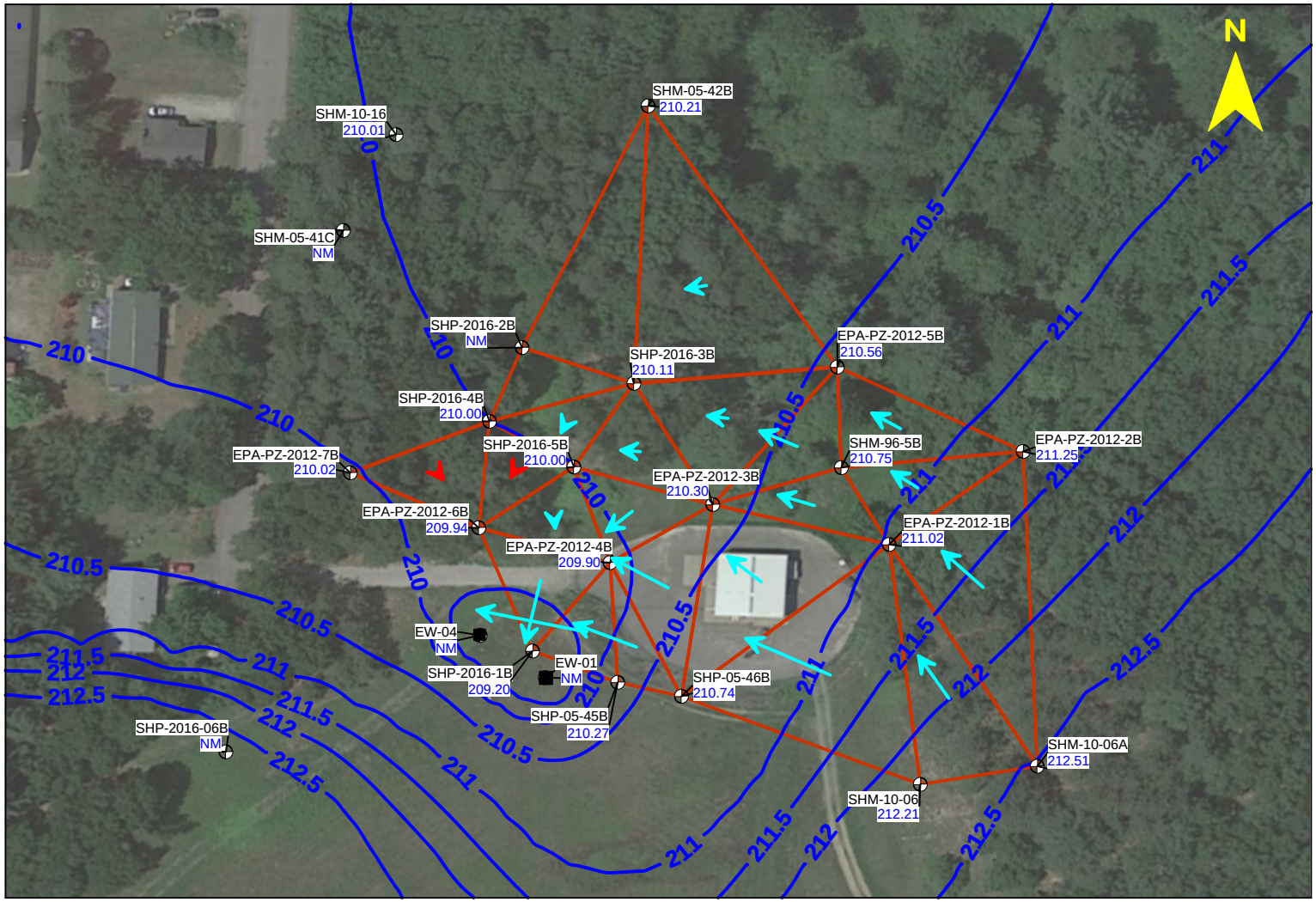
FIGURE
4




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Hydraulic Gradient Arrow (Scale Factor = 5,000)
- Groundwater Elevation Contour (0.5 ft interval)

Scale in feet

0 120 240

Notes

1. NM = Not measured
2. Red arrows indicate gradients less than 0.001 ft/ft.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

August 16, 2016
3PE Hydraulic Vectors and
Groundwater Elevation Contours

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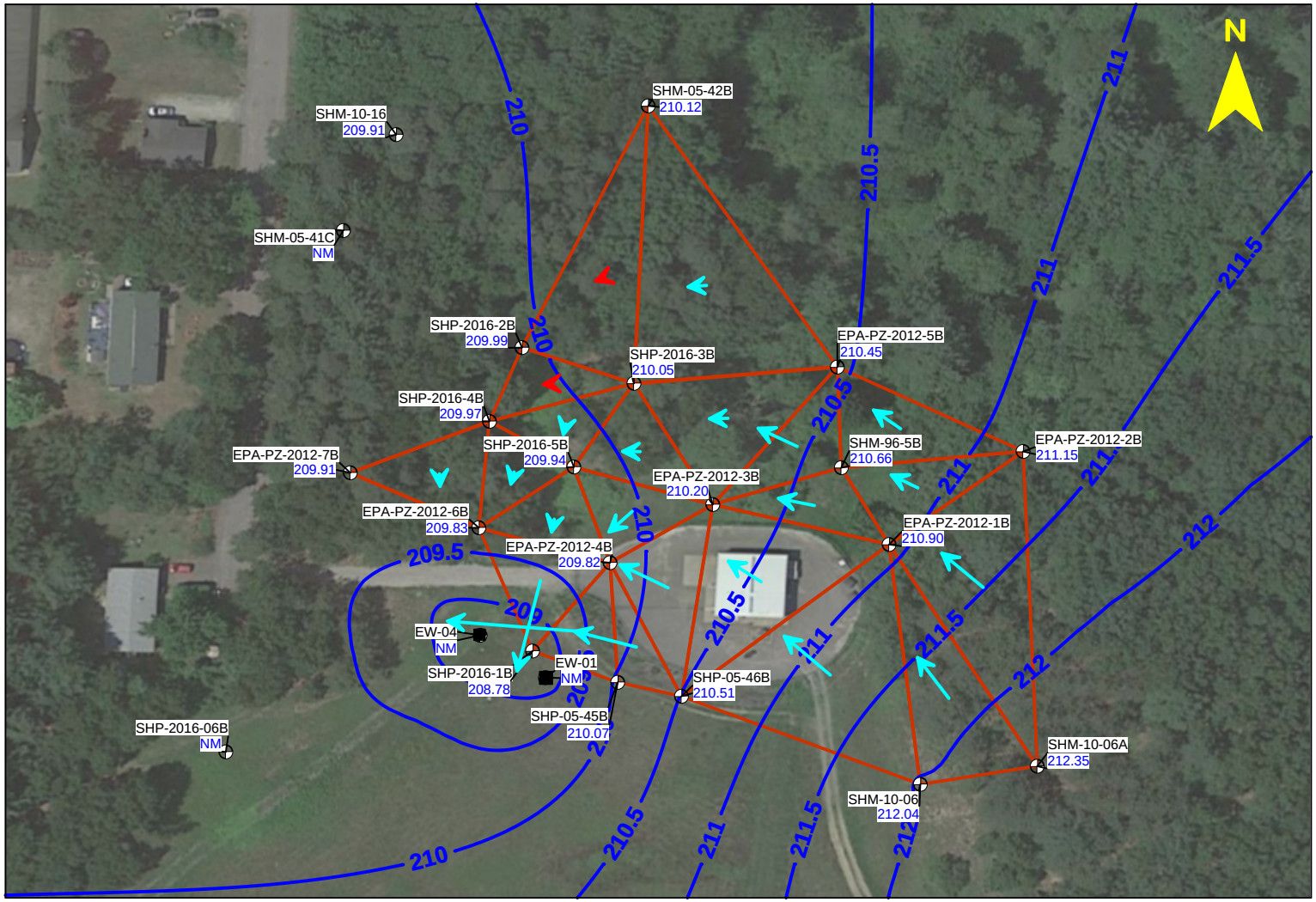
FIGURE
5




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Hydraulic Gradient Arrow (Scale Factor = 5,000)
- Groundwater Elevation Contour (0.5 ft interval)

Scale in feet

0 120 240

Notes

1. NM = Not measured
2. Red arrows indicate gradients less than 0.001 ft/ft.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

October 20, 2016
3PE Hydraulic Vectors and Groundwater Elevation Contours

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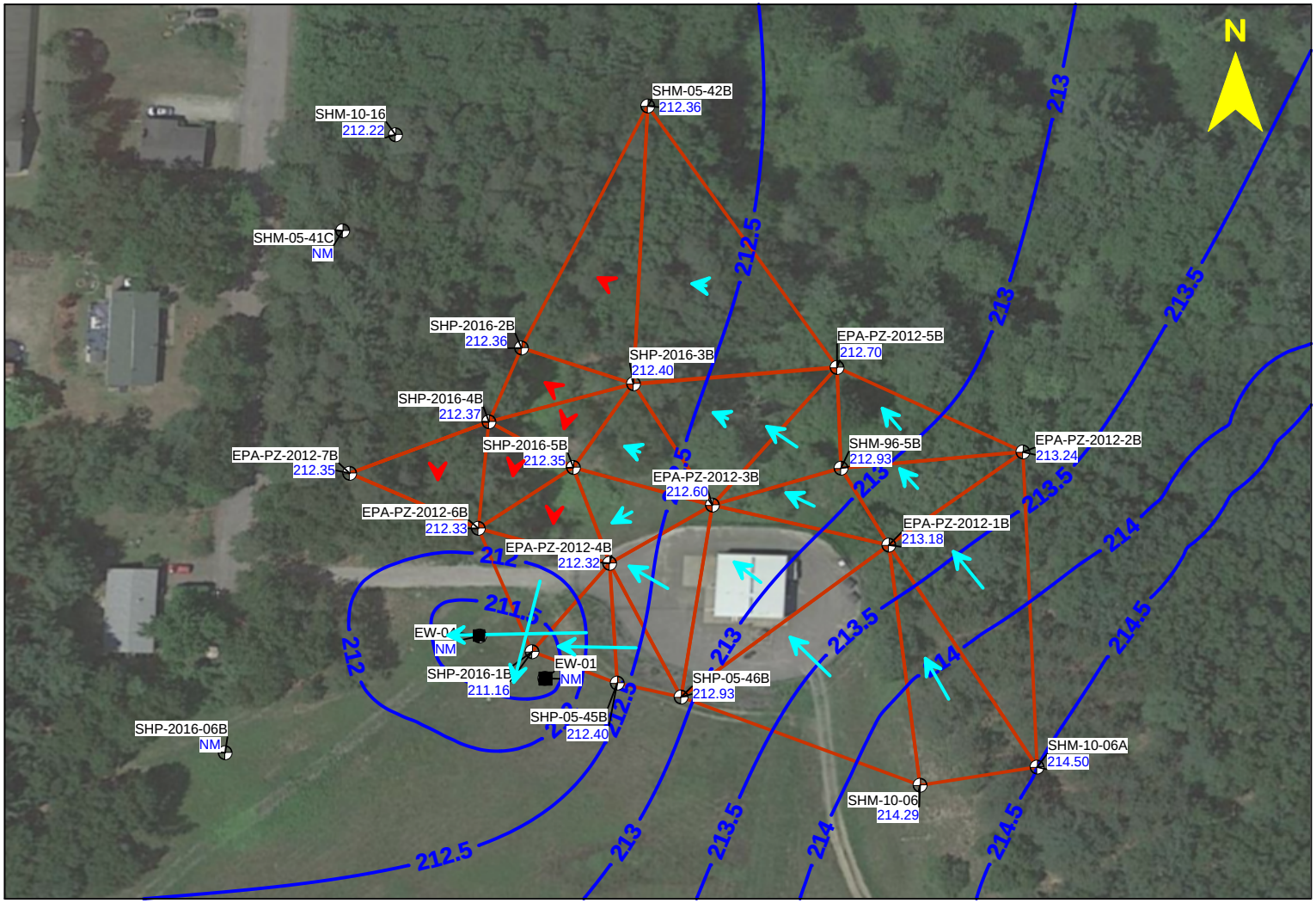
FIGURE
6




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Hydraulic Gradient Arrow (Scale Factor = 5,000)
- Groundwater Elevation Contour (0.5 ft interval)

Scale in feet

0 120 240

Notes

1. NM = Not measured
2. Red arrows indicate gradients less than 0.001 ft/ft.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

March 2, 2017
3PE Hydraulic Vectors and Groundwater Elevation Contours

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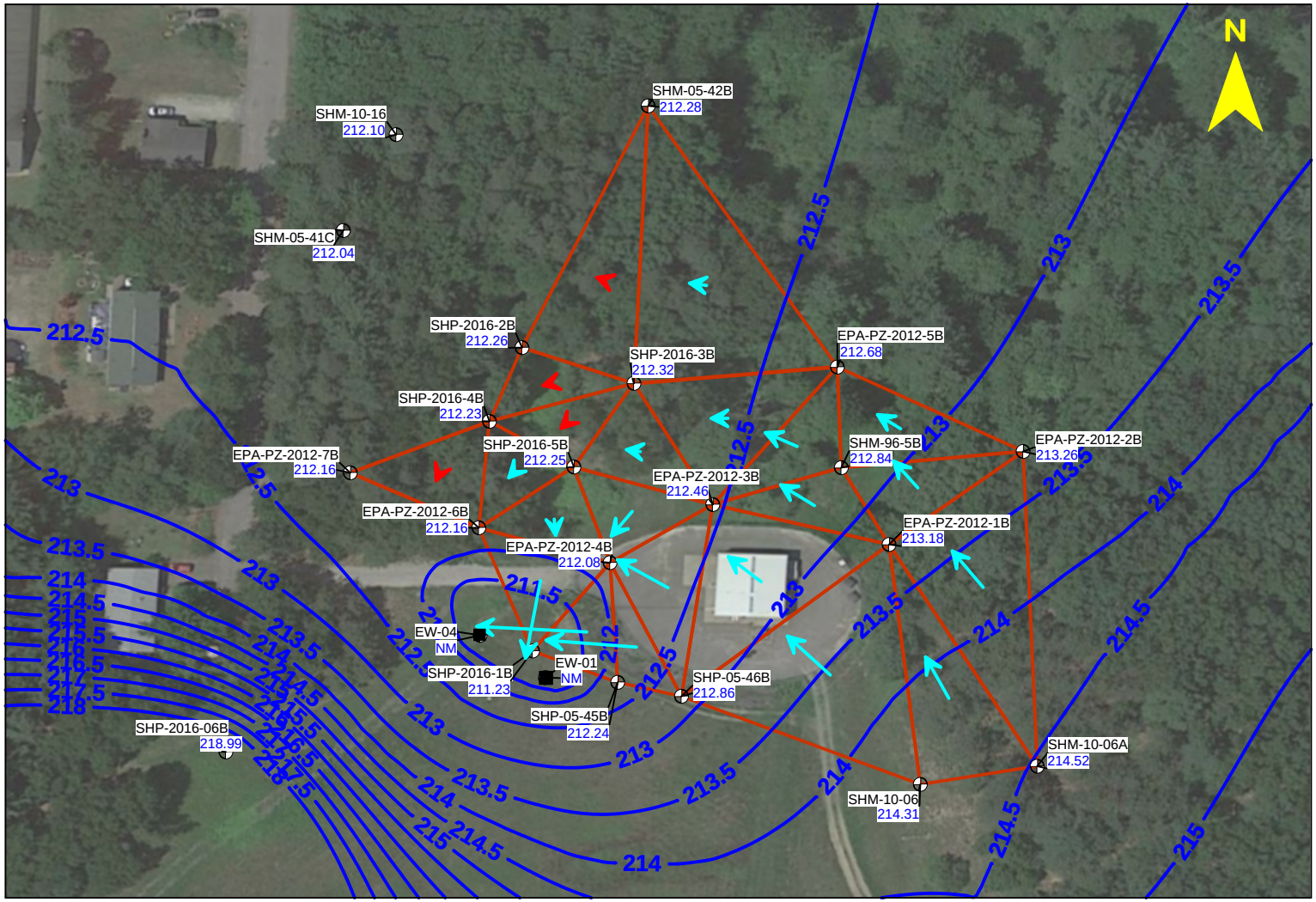
FIGURE
7




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Hydraulic Gradient Arrow (Scale Factor = 5,000)
- Groundwater Elevation Contour (0.5 ft interval)

Scale in feet

0 120 240

Notes

1. NM = Not measured
2. Red arrows indicate gradients less than 0.001 ft/ft.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

November 2, 2017
3PE Hydraulic Vectors and
Groundwater Elevation Contours

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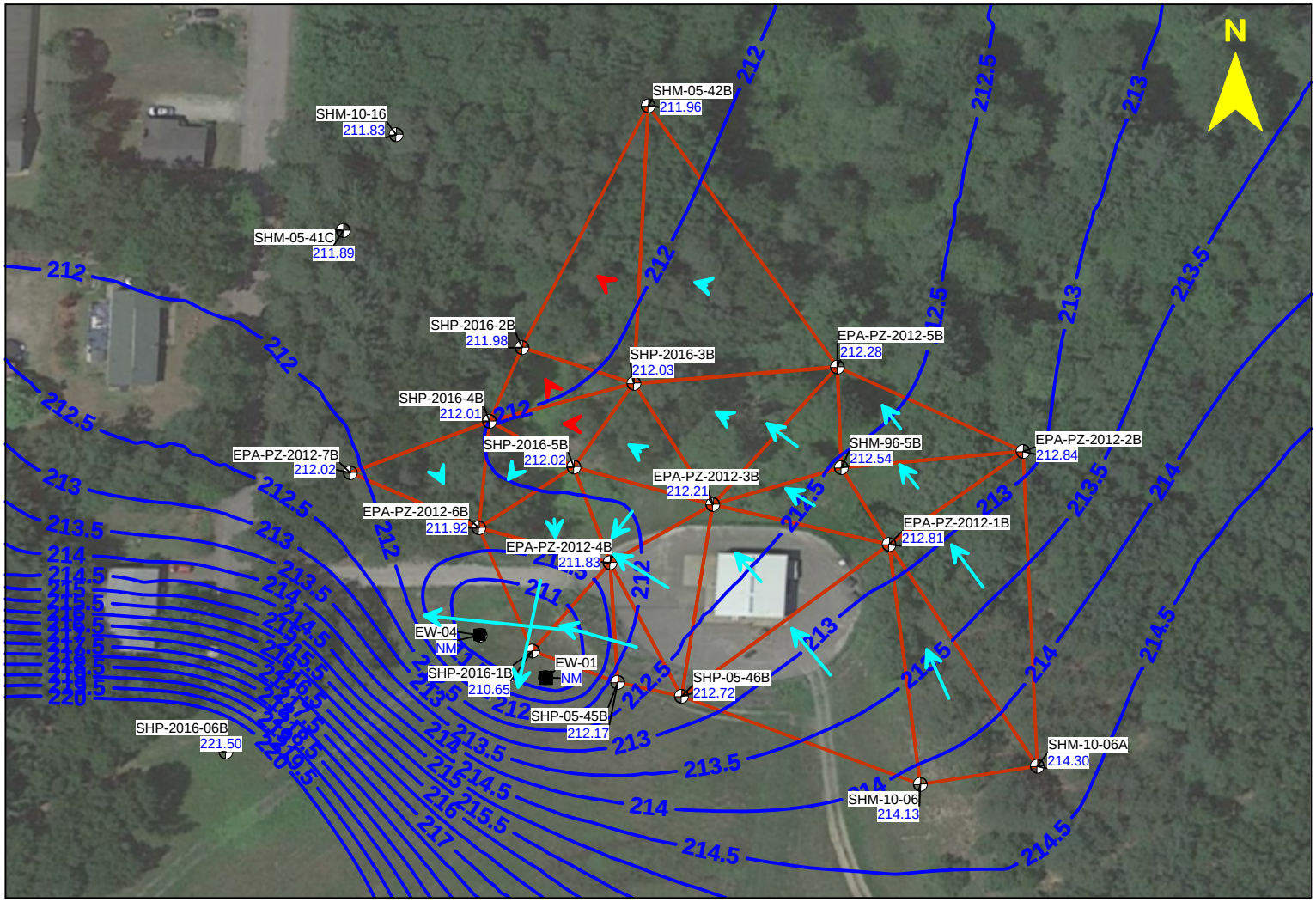
FIGURE
8




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Hydraulic Gradient Arrow (Scale Factor = 5,000)
- Groundwater Elevation Contour (0.5 ft interval)

Scale in feet

0 120 240

Notes

1. NM = Not measured
2. Red arrows indicate gradients less than 0.001 ft/ft.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

May 22, 2018
3PE Hydraulic Vectors and Groundwater Elevation Contours

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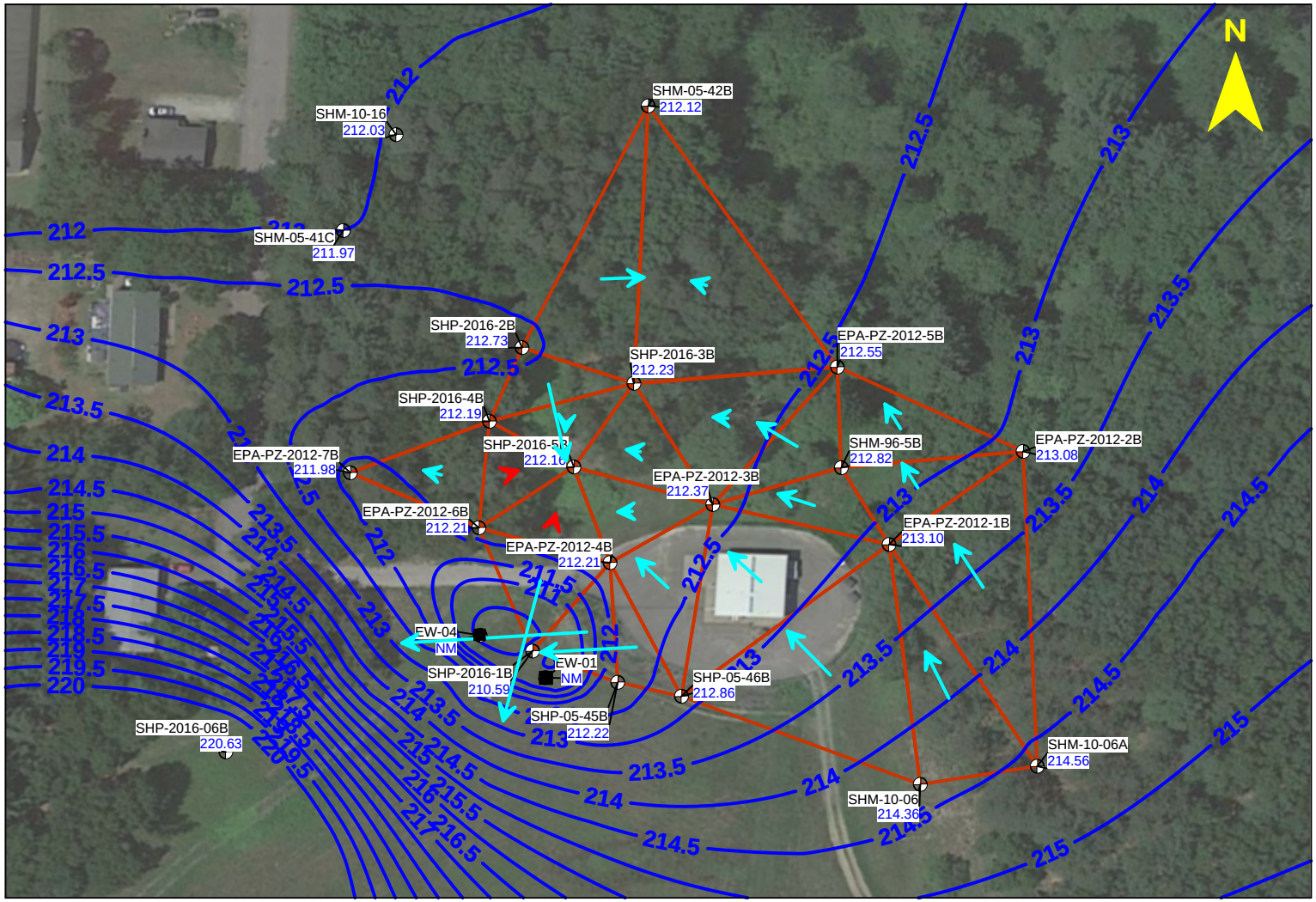
FIGURE
9




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Hydraulic Gradient Arrow (Scale Factor = 5,000)
- Groundwater Elevation Contour (0.5 ft interval)

Scale in feet

0 120 240

Notes

1. NM = Not measured
2. Red arrows indicate gradients less than 0.001 ft/ft.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

November 1, 2018
3PE Hydraulic Vectors and Groundwater Elevation Contours

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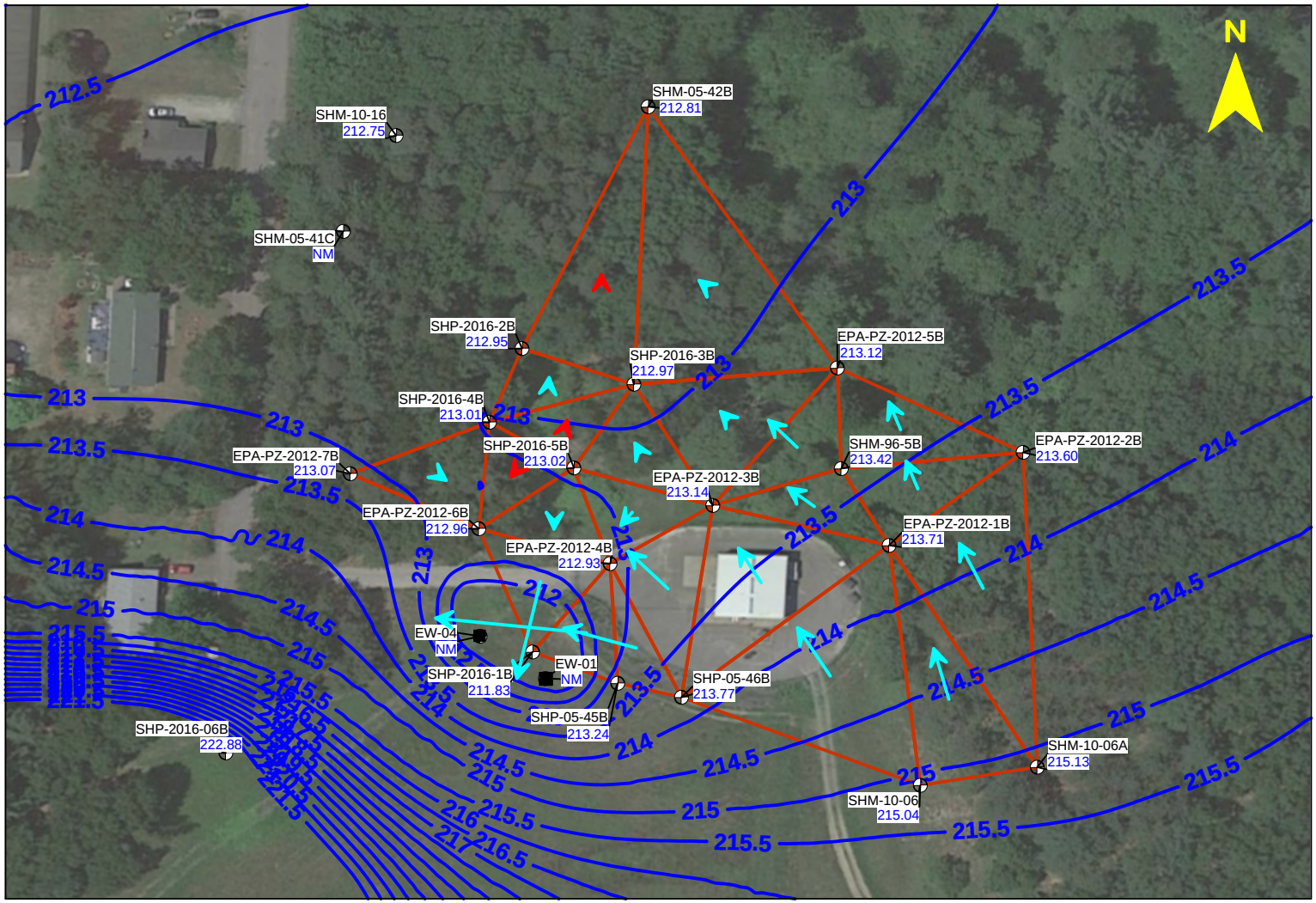
FIGURE
10




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Hydraulic Gradient Arrow (Scale Factor = 5,000)
- Groundwater Elevation Contour (0.5 ft interval)

Scale in feet

0 120 240

Notes

1. NM = Not measured
2. Red arrows indicate gradients less than 0.001 ft/ft.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

May 13, 2019
3PE Hydraulic Vectors and Groundwater Elevation Contours

SERES Engineering & Services, LLC
ARCADIS
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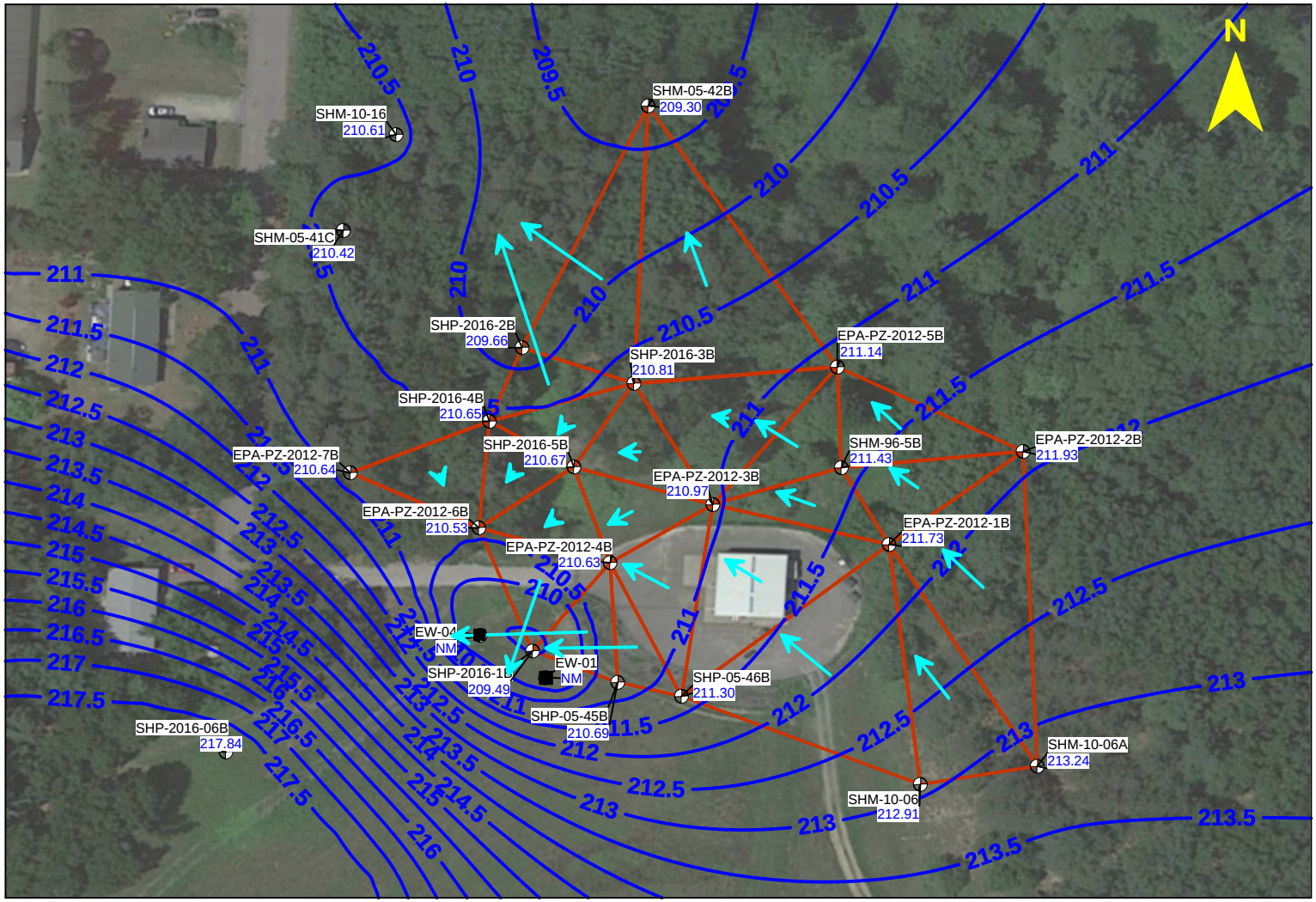
FIGURE
11




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Hydraulic Gradient Arrow (Scale Factor = 5,000)
- Groundwater Elevation Contour (0.5 ft interval)

Scale in feet

0 120 240

Notes

1. NM = Not measured

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

October 22, 2019
3PE Hydraulic Vectors and
Groundwater Elevation Contours

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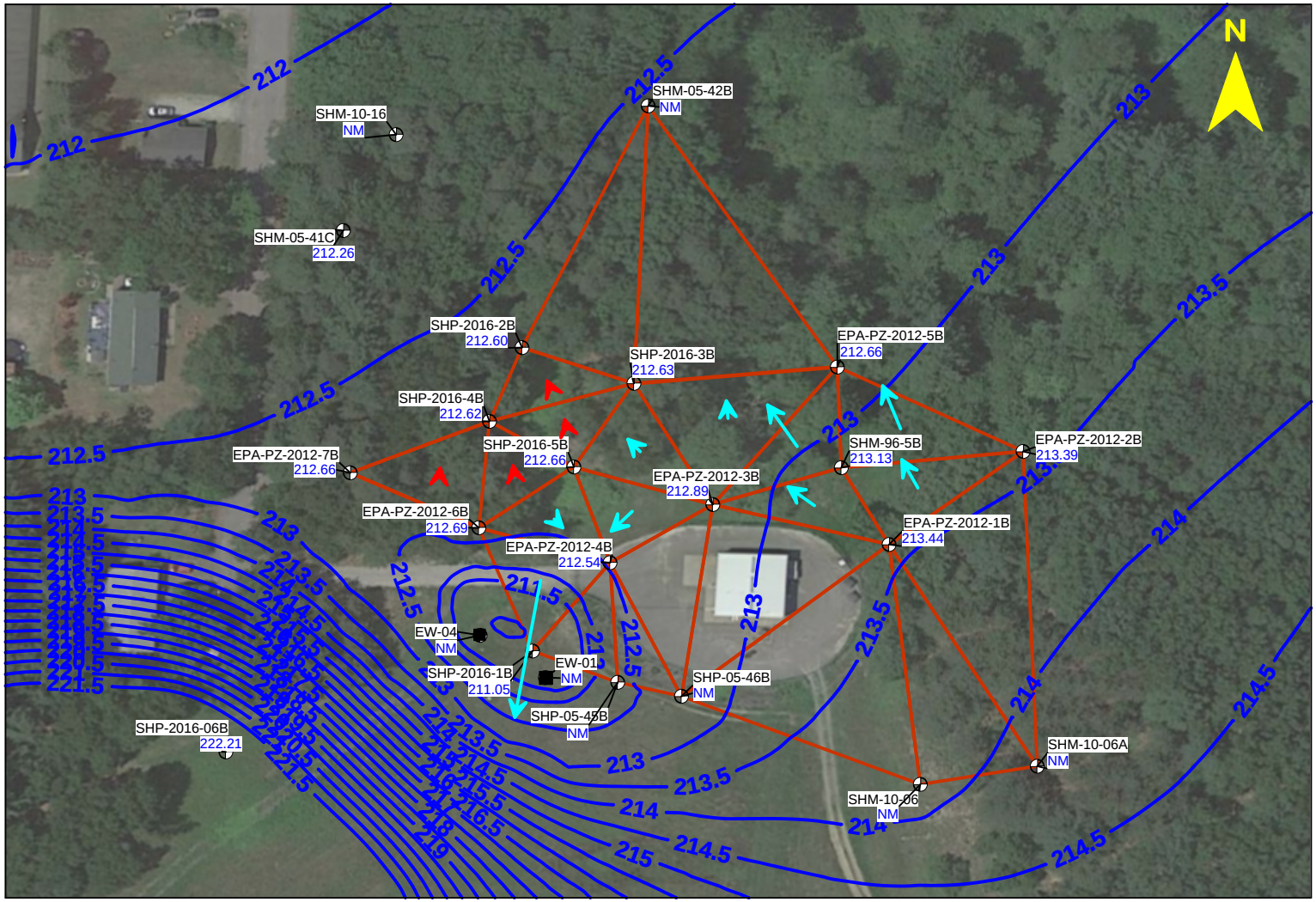
FIGURE
12




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Hydraulic Gradient Arrow (Scale Factor = 5,000)
- Groundwater Elevation Contour (0.5 ft interval)

Scale in feet

0 120 240

Notes

1. NM = Not measured
2. Red arrows indicate gradients less than 0.001 ft/ft.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

May 18, 2020
3PE Hydraulic Vectors and Groundwater Elevation Contours

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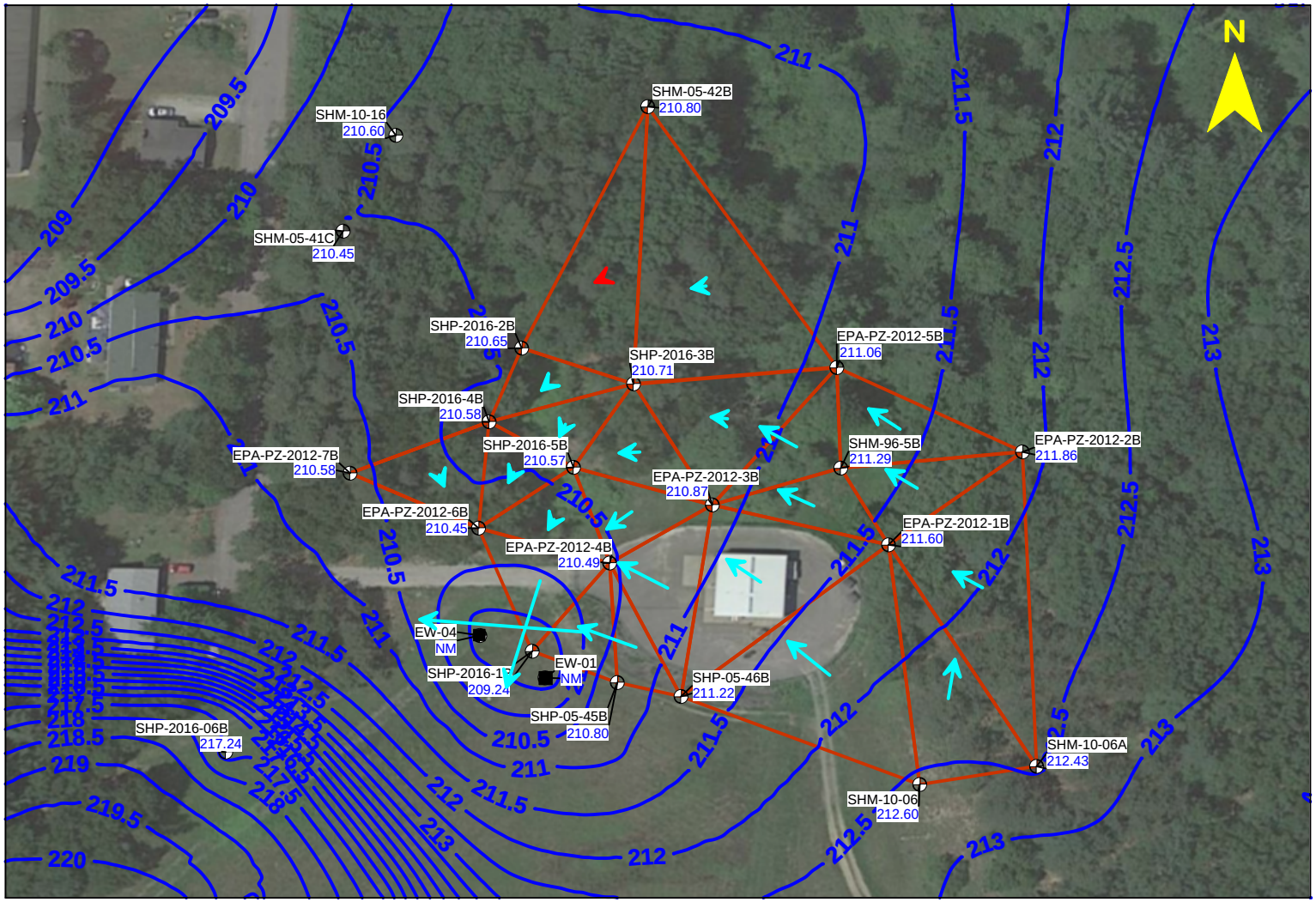
FIGURE
13




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Hydraulic Gradient Arrow (Scale Factor = 5,000)
- Groundwater Elevation Contour (0.5 ft interval)

Scale in feet

0 120 240

Notes

1. NM = Not measured
2. Red arrows indicate gradients less than 0.001 ft/ft.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

November 4, 2020
3PE Hydraulic Vectors and
Groundwater Elevation Contours

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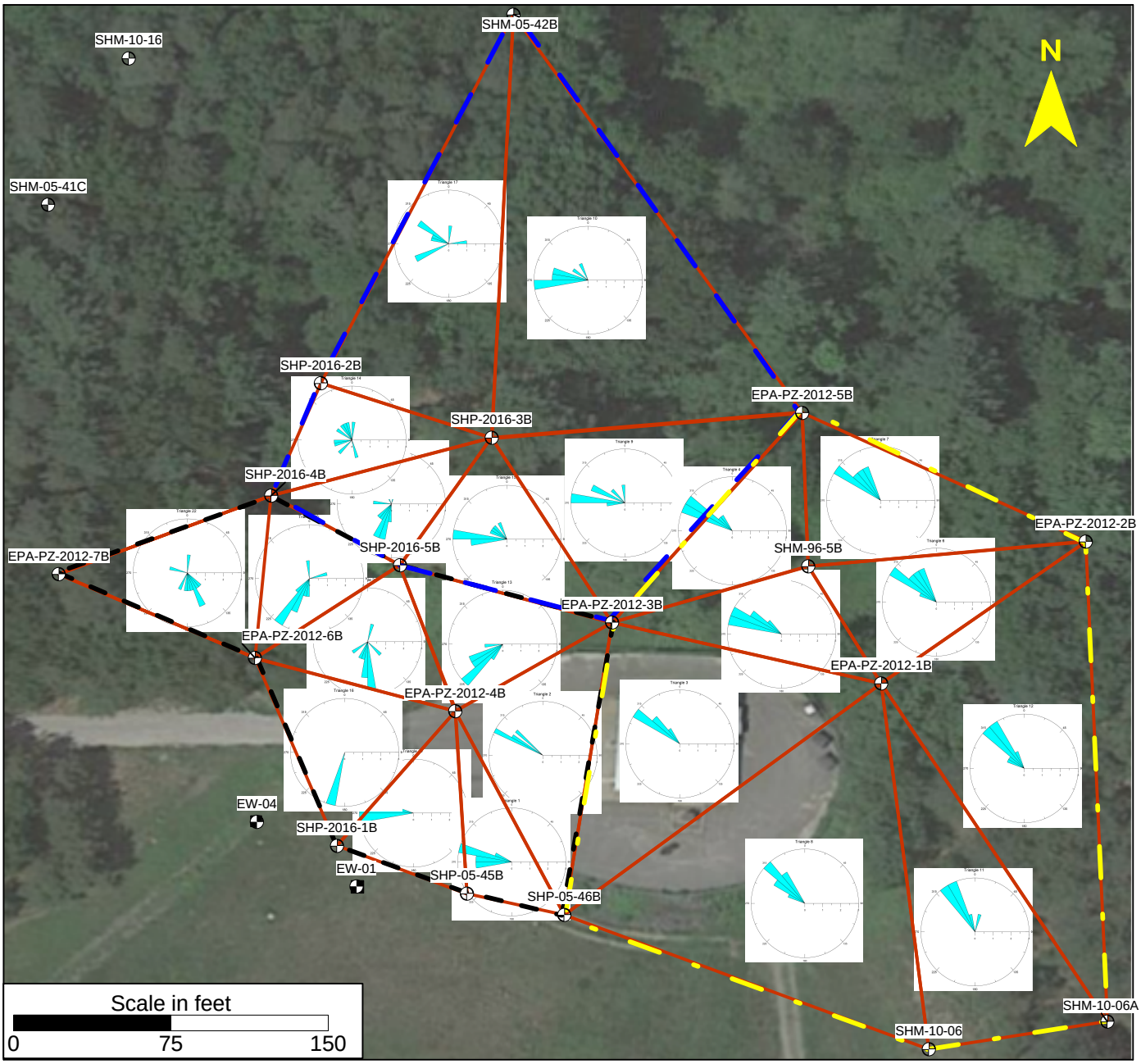
FIGURE
14




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Rose Diagram of Hydraulic Gradient directions for all time periods

Notes:

The black, blue, and yellow polygons represent zoom in areas to show the Rose diagrams in detail on Figures 16, 17, and 18, respectively.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

ROSE DIAGRAMS

SERES Engineering & Services, LLC
ARCADIS
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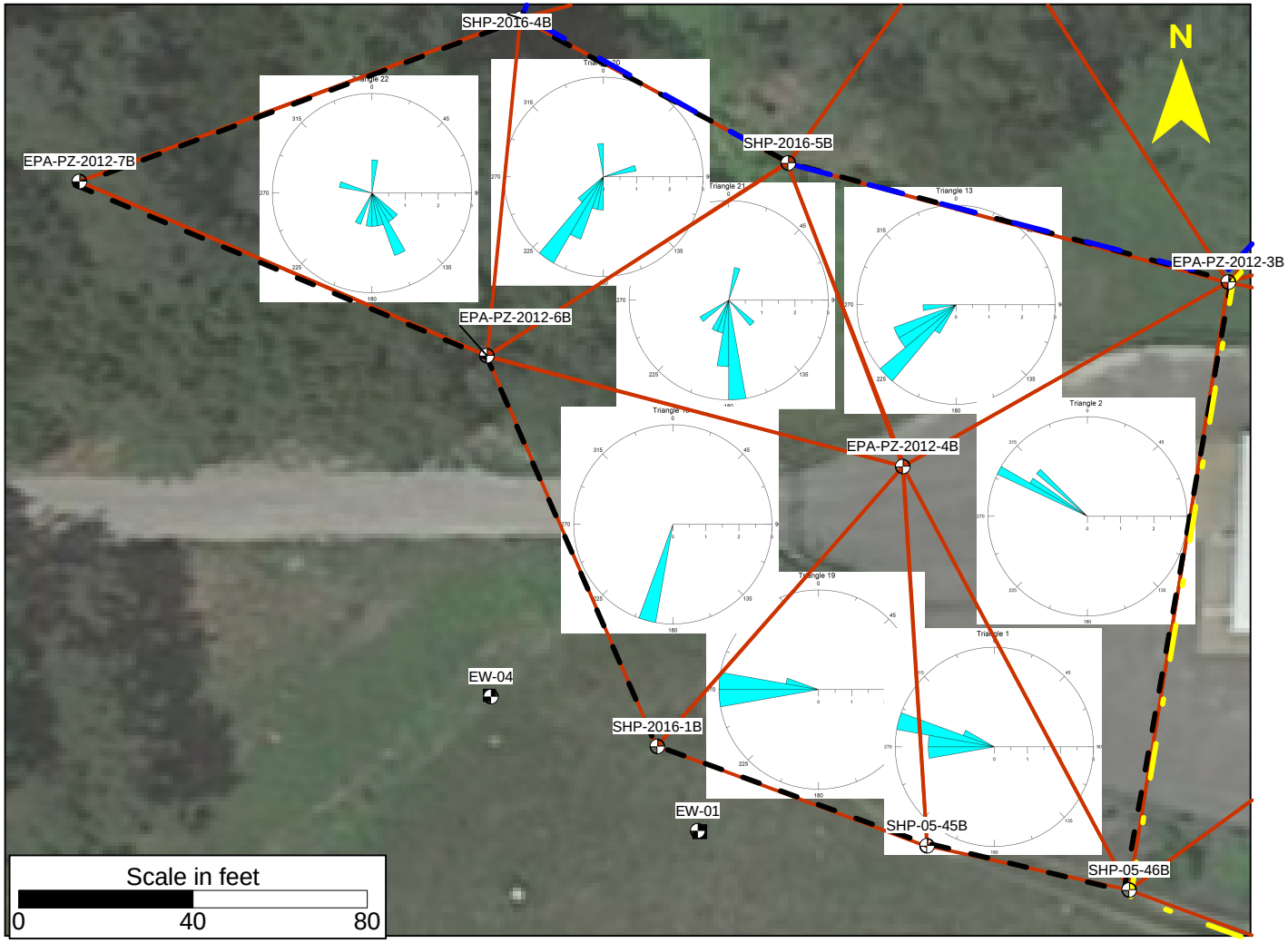
FIGURE
15




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Rose Diagram of Hydraulic Gradient directions for all time periods

Notes:

The full area is shown on Figure 15.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

ROSE DIAGRAMS FOR BLACK POLYGON

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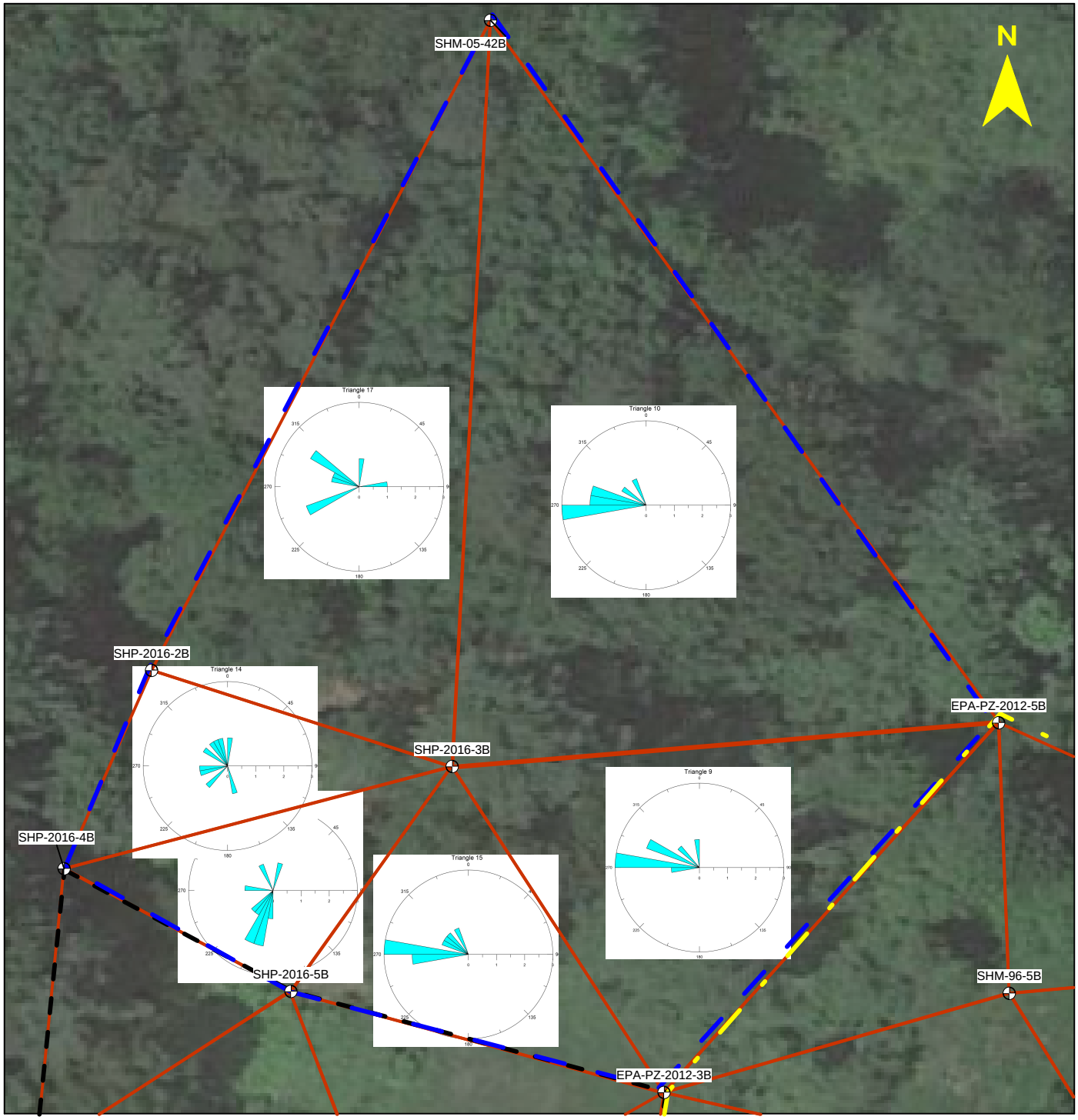
FIGURE
16




Scale in feet

0 40 80

## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Rose Diagram of Hydraulic Gradient directions for all time periods

Notes:

The full area is shown on Figure 15.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

ROSE DIAGRAMS FOR BLUE POLYGON

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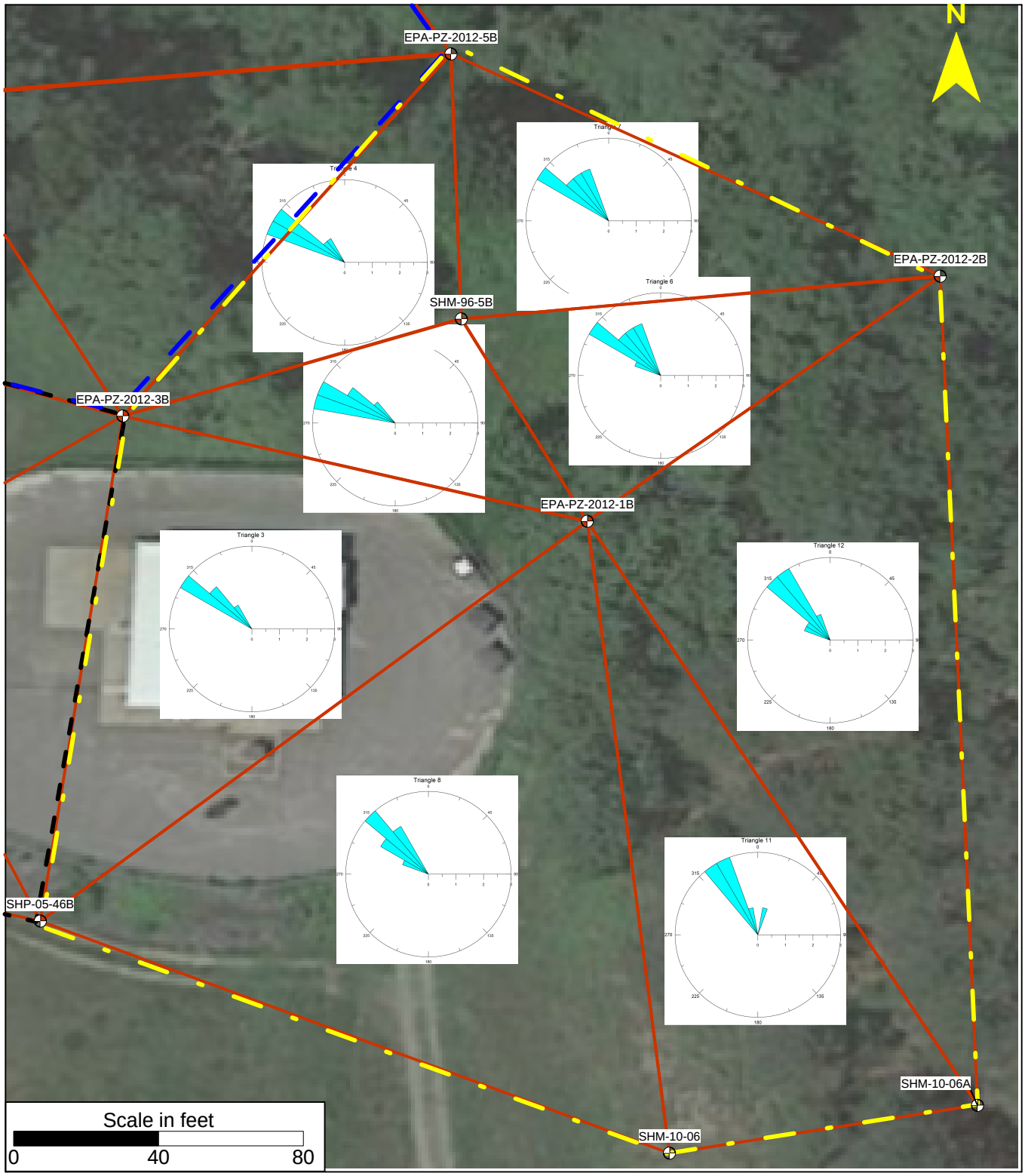
FIGURE
17




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Rose Diagram of Hydraulic Gradient directions for all time periods

Notes:

The full area is shown on Figure 15.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

ROSE DIAGRAMS FOR YELLOW POLYGON

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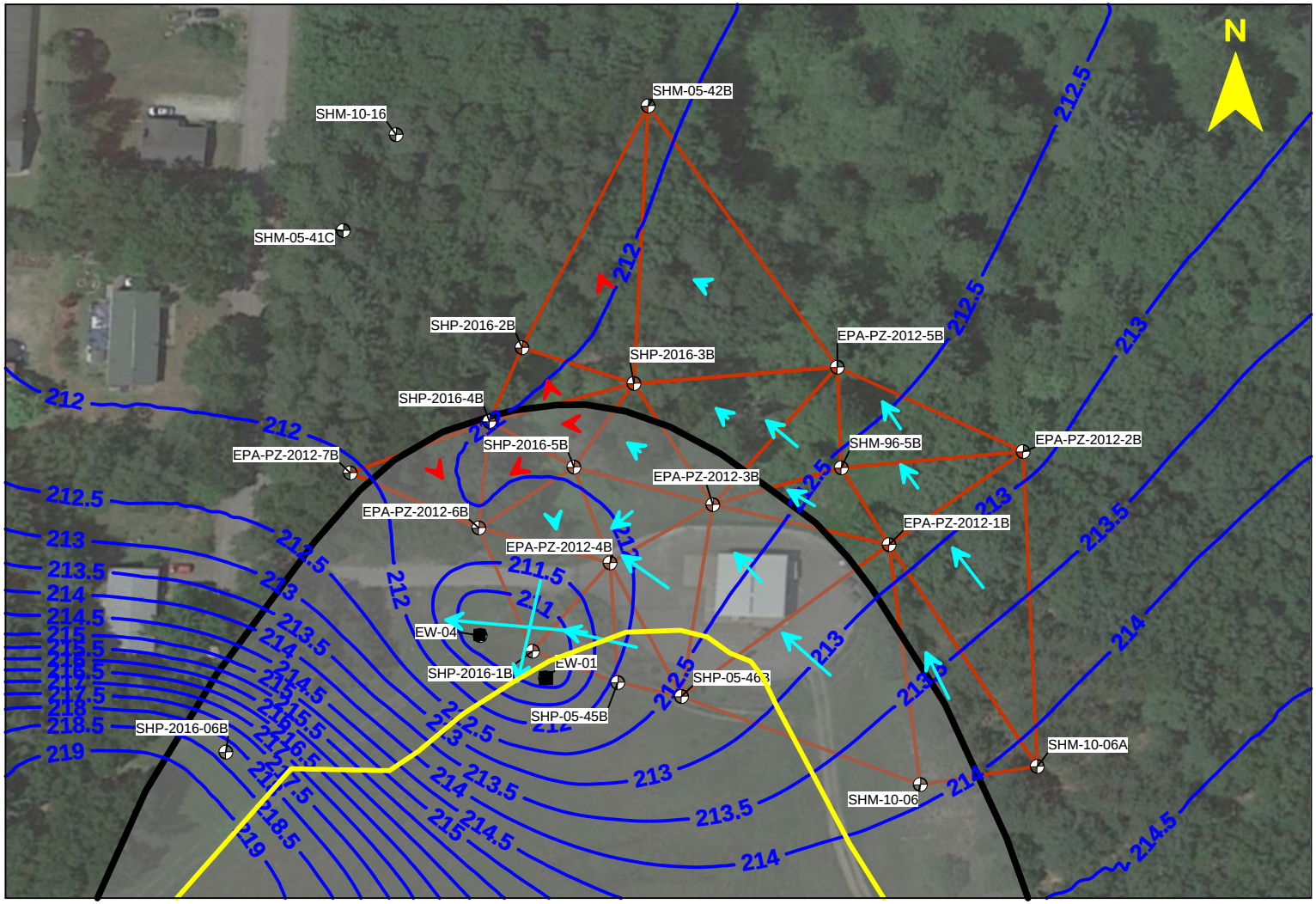
FIGURE
18




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Hydraulic Gradient Arrow (Scale Factor = 5,000)
- Average Spring 2016-2020 Groundwater Elevation Contour (0.5 ft interval)

Scale in feet

0 120 240

- Estimated Average Spring 2016-2020 Groundwater Capture Zone
- Shepley's Hill Landfill Boundary

Notes

1. Red arrows indicate gradients less than 0.001 ft/ft.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

Estimated Average Spring 2016-2020 Groundwater Capture Zone

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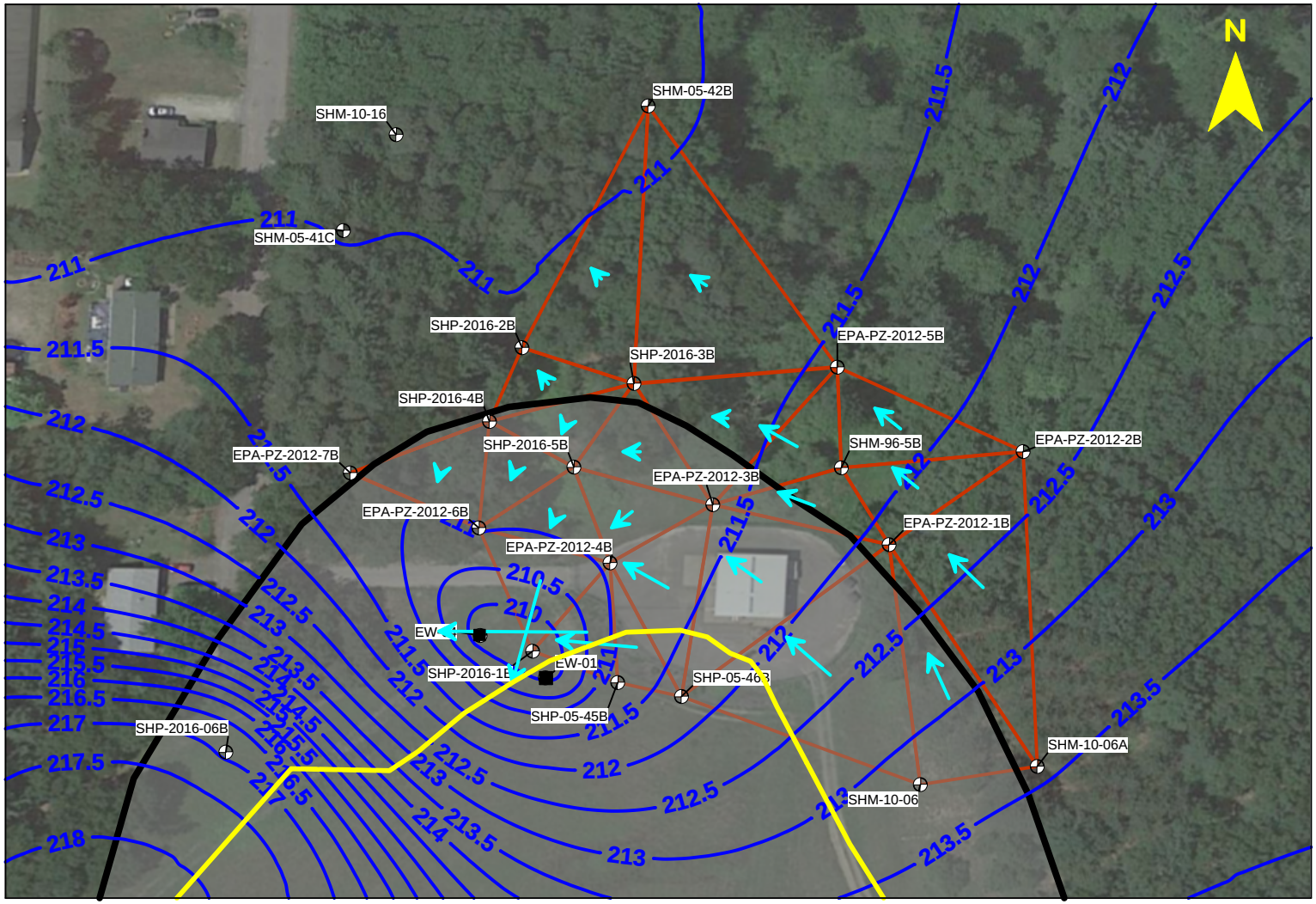
FIGURE
19




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Hydraulic Gradient Arrow (Scale Factor = 5,000)
- Average Fall 2016-2020 Groundwater Elevation Contour (0.5 ft interval)

Scale in feet

0 120 240

- Estimated Average Fall 2016-2020 Groundwater Capture Zone
- Shepley's Hill Landfill Boundary

Notes

1. Red arrows indicate gradients less than 0.001 ft/ft.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

Estimated Average Fall 2016-2020 Groundwater Capture Zone

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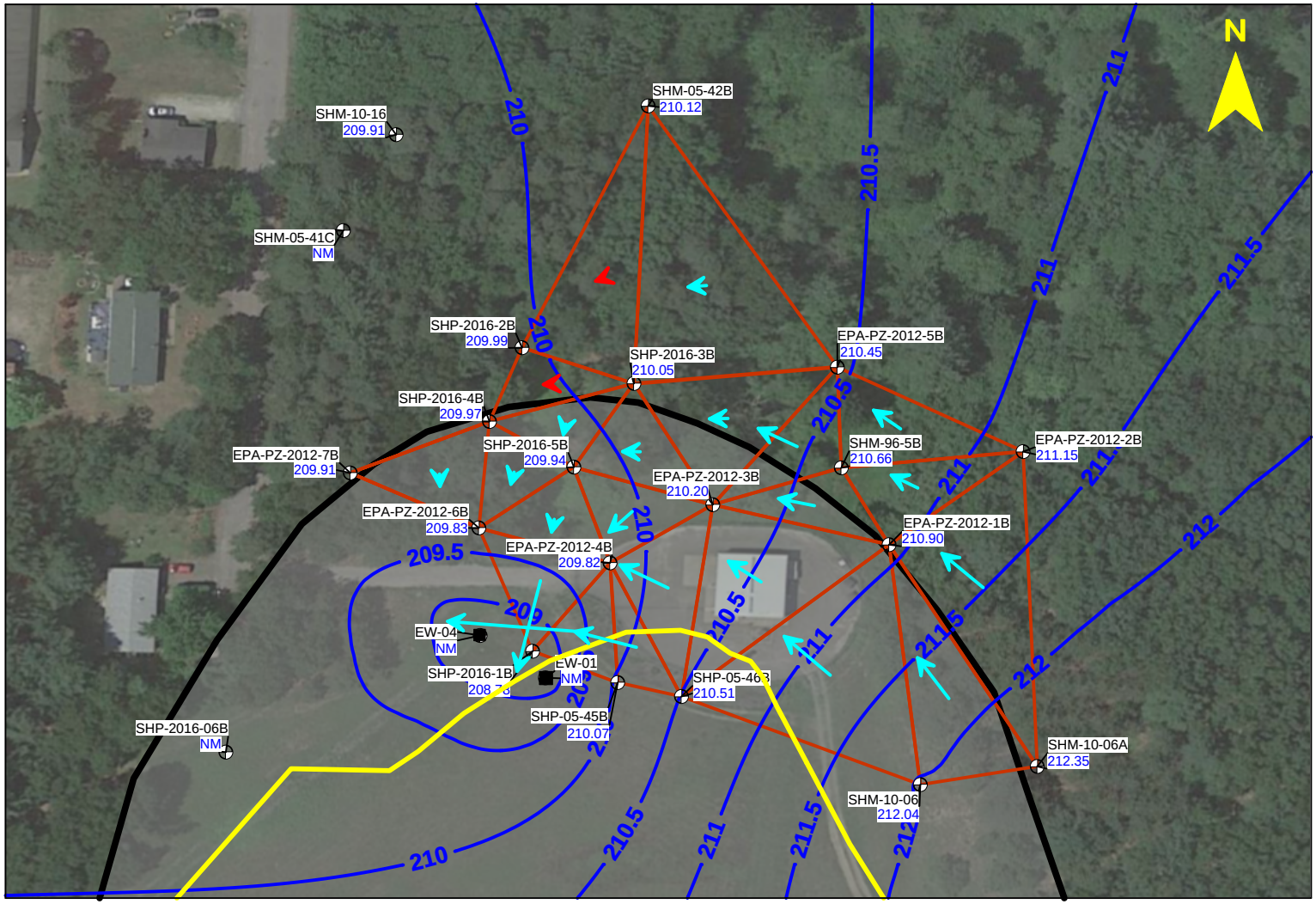
FIGURE
20




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Hydraulic Gradient Arrow (Scale Factor = 5,000)
- Average Spring 2016-2020 Groundwater Elevation Contour (0.5 ft interval)

Scale in feet

0 120 240

- Estimated Groundwater Capture Zone for October 20, 2016
- Shepley's Hill Landfill Boundary

Notes

1. Red arrows indicate gradients less than 0.001 ft/ft.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

Estimated October 20, 2016
Groundwater Capture Zone

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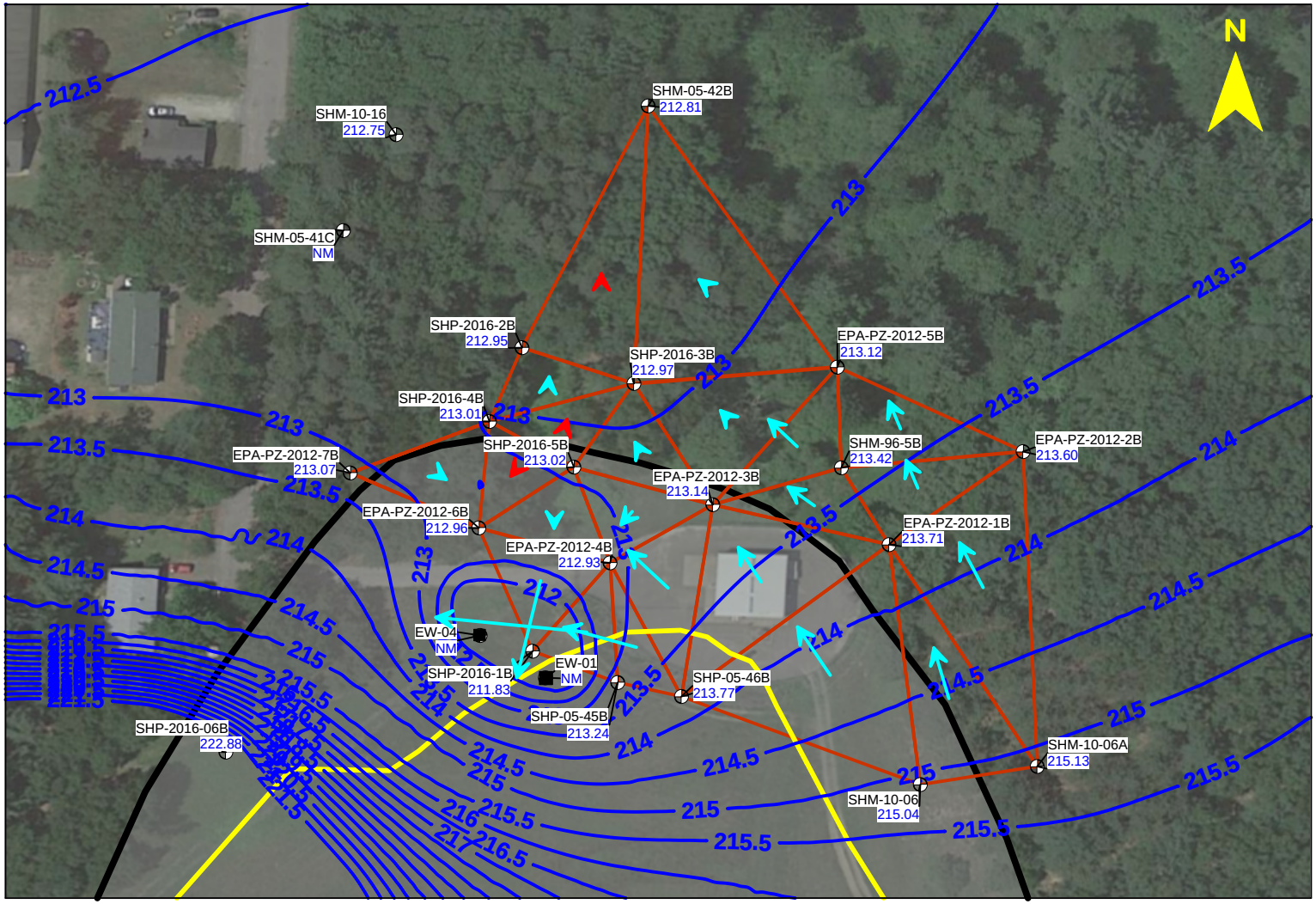
FIGURE
21




## Legend

- Extraction Wells
- Monitoring Wells
- Triangle for Vector Analysis
- Hydraulic Gradient Arrow (Scale Factor = 5,000)
- Average Spring 2016-2020 Groundwater Elevation Contour (0.5 ft interval)

Scale in feet

0 120 240

- Estimated Groundwater Capture Zone for May 13, 2019
- Shepley's Hill Landfill Boundary

Notes

1. Red arrows indicate gradients less than 0.001 ft/ft.

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

Estimated May 13, 2019
Groundwater Capture Zone

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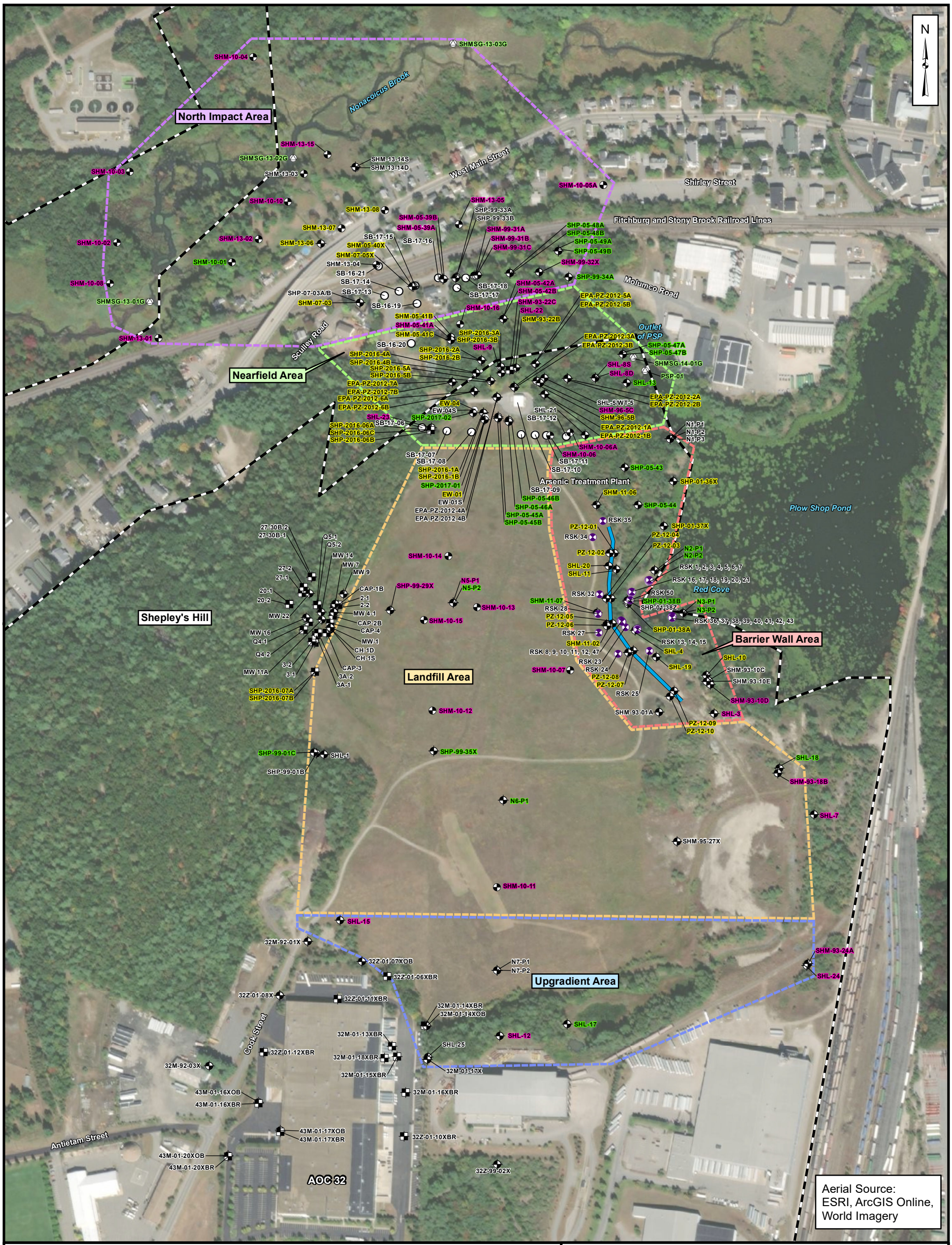
FIGURE
22




Legend

- Former Fort Devens Boundary
- Overburden Monitoring Well/Piezometer
- Groundwater Profiling Location/Monitoring Well
- Monitoring Well
- Bedrock Monitoring Well
- Bedrock Study Core
- Extraction Well
- Stream Gauge
- Soil Boring
- Barrier Wall

| | |
|---|---|
| PZ-12-07 | Well/Boring/Gauge Identification |
| SHM-13-01 | LTM Well/Piezometer Annual Sampling (Fall) |
| SHL-10 | LTM Well/Piezometer Semiannual Sampling (Spring/Fall) |
| SHP-99-01B | LTM Well/Piezometer Hydraulic Monitoring Only |

LTM = long-term monitoring
LTMMP = Long-Term Monitoring and Maintenance Plan

Notes:
1. LTM well network established from LTMMP Update (Sovereign 2015) and LTMMP Addendum (KGS 2018).

0 200 400
Feet

2021 Technical Memorandum
Shepley's Hill Landfill
Former Fort Devens Army Installation
Devens, Massachusetts

**Long-Term Monitoring Well Network**

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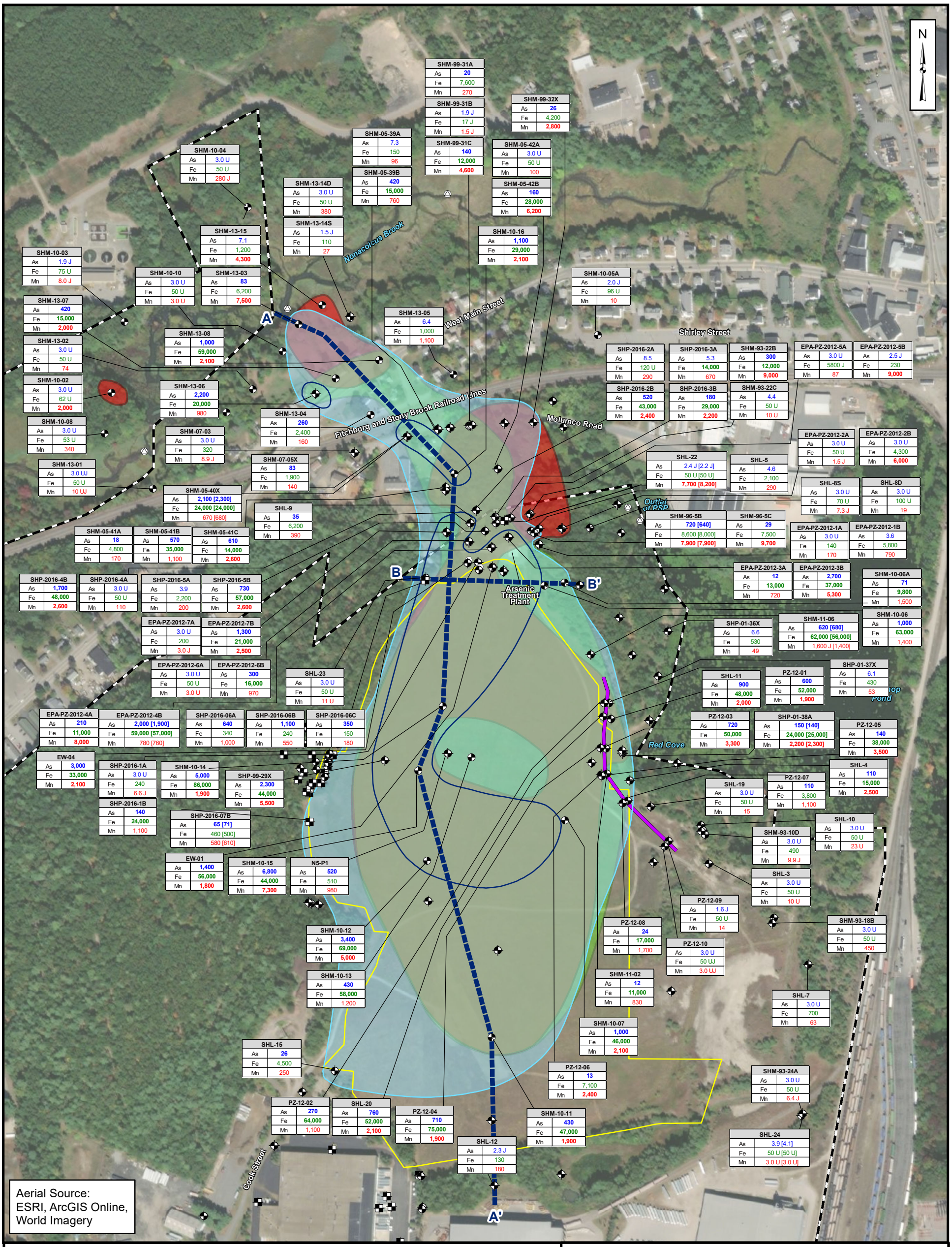
Figure
**23**




Legend

- Former Fort Devens Boundary
- Shepley's Hill Landfill Boundary
- Overburden Monitoring Well/Piezometer
- Groundwater Profiling Location/Monitoring Well
- Bedrock Monitoring Well
- Extraction Well
- Stream Gauge
- Barrier Wall
- Interpreted Area of Arsenic >10 ug/L
- Interpreted Area of Arsenic > 1,000 µg/L
- Interpreted Area of Arsenic > CL of 10 µg/L
- Interpreted Area of Iron > CL of 9,100 µg/L
- Interpreted Area of Manganese > CL of 1,715 µg/L
- Cross-Section Location

Notes:
1. All concentrations are in micrograms per liter (µg/L).
2. As = Arsenic.
3. Fe = Iron.
4. Mn = Manganese.
5. J = Estimated result.
6. U = Analyte was below detection limit.
7. As concentrations are presented in blue.
8. Fe concentrations are presented in green.
9. Mn concentrations are presented in red.
10. Duplicate results are presented in parenthesis "[]" following the sample results.
11. **Bold** values indicate an exceedance of the Cleanup Levels (CLs).

0 200 400
Feet

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Devens, Massachusetts

**Extent of Dissolved Metals in Groundwater October/November 2020**

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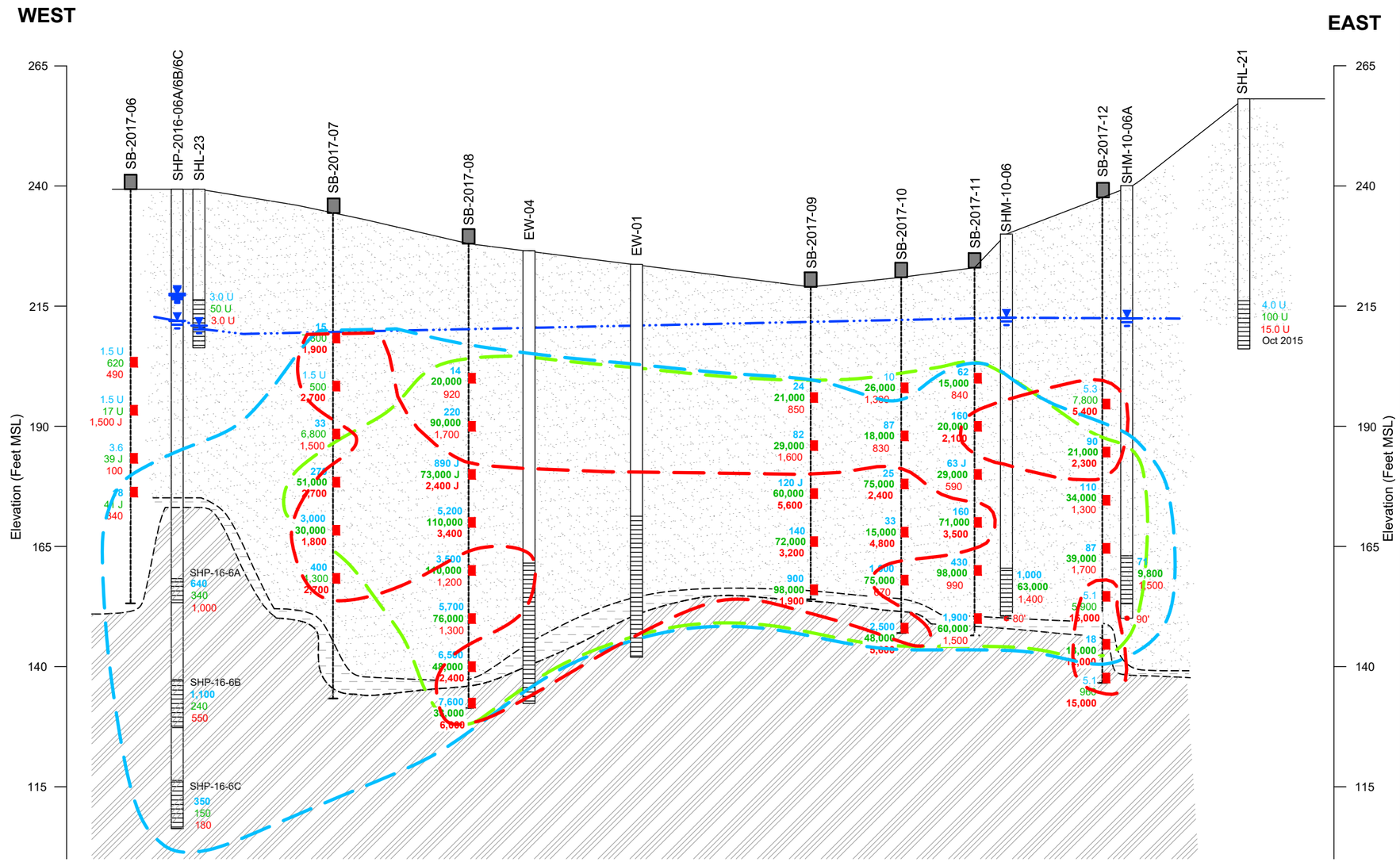
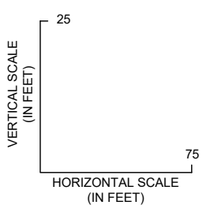
Figure
**24**

File: Figure 21 - GW Metals Results.mxd




## Legend

SHL-21

Monitoring Well

4.0 U Arsenic Concentration (µg/L)
100 U Iron Concentration (µg/L)
15.0 U Manganese Concentration (µg/L)
U, J = Laboratory Qualifiers

Results shown for monitoring wells are from October/November 2020 or most recent sampling event for that well as specified.

Well Casing

Screened Interval

90' Depth to Refusal

SB-16-09

2017 Soil Boring

25 Arsenic Concentration (µg/L)
75,000 Iron Concentration (µg/L)
2,400 Manganese Concentration (µg/L)
U, J = Laboratory Qualifiers

Sample Interval (1 Foot)

Boring to Refusal

Interpreted Area of Arsenic > CL of 10 µg/L
Interpreted Area of Iron > CL of 9,100 µg/L
Interpreted Area of Manganese > CL of 1,715 µg/L

Water Table Elevations for Monitoring Wells are from November 2020 Well Hydraulic Gauging Event

Sand

Bedrock

Till

Notes:
1. MSL = Mean Seal Level
2. µg/L = Micrograms per Liter
3. J = Estimated Result
4. U = Non-Detect
5. **Bold** values indicate an exceedance of the Cleanup Levels (CLs)
6. Depth to bottom of boring not available for SHL-21 and SHL-23.
7. Strata data shown on Figure 5-8 of the September 2020 Area 2 Preliminary Site Characterization Summary Per- and Polyfluoroalkyl Substances (PFAS) Remedial Investigation by KOMAN Government Solutions, LLC were used to develop this figure.

2021 Technical Memorandum
Shepley's Hill Landfill
Former Fort Devens Army Installation
Devens, Massachusetts

# DISSOLVED METALS IN GROUNDWATER - WEST TO EAST CROSS SECTION

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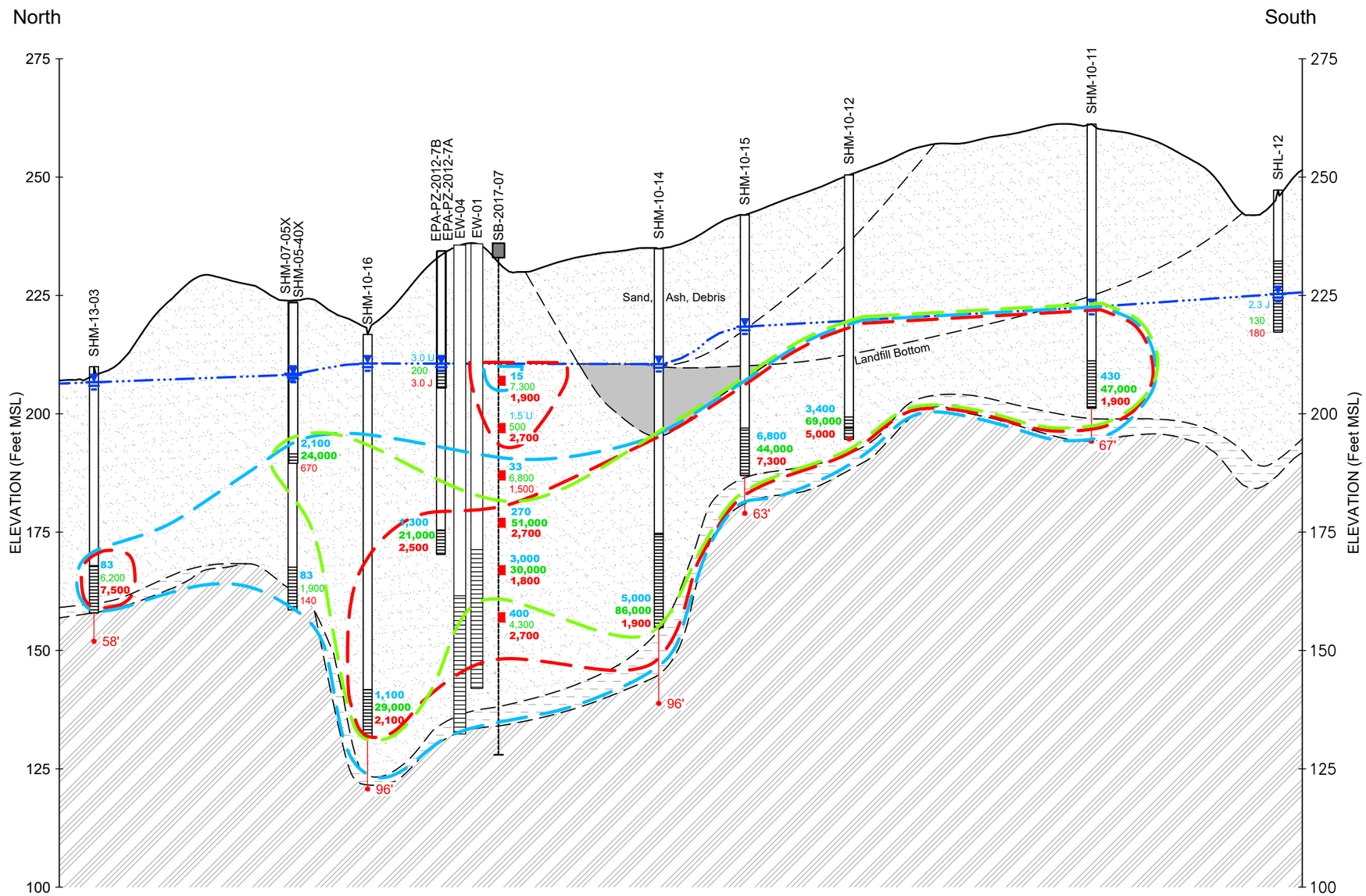
Figure
25

CITY: SYRACUSE, NY DIV/GROUP: IMDV DB: M.WASILEWSKI K.DAVIS, R. ALLEN LD: M.WASILEWSKI PIC: K.ABBOTT PM: J.GRAVENMIER TM: A.BAIRD LYR: ON=*;OFF=*REF*
C:\Users\mwasilewski\BIM 360\Arcadis\ANA-USACE\Project Files\DEVENS MA\2021\01-DWG\USACE_SHL - CROSS SECTION EW.dwg LAYOUT: F9-SHL23-SHL21 SAVED: 3/9/2021 7:09 AM ACADVER: 23.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 6/9/2021 8:30 AM
BY: WASILEWSKI, MATT
XREFS: IMAGES: PROJECTNAME: ----
Seres-Arcadis_jvLogo_0.5-in high.jpg




VERTICAL SCALE (IN FEET): 25

HORIZONTAL SCALE (IN FEET): 400

## Legend

EPA-PZ-2012-7A — Monitoring Well

- 430 Arsenic Concentration (µg/L)
- 47,000 Iron Concentration (µg/L)
- 1,900 Manganese Concentration (µg/L)
- U, J = Laboratory Qualifiers

Results shown for monitoring wells are from October/November 2020 or most recent sampling event for that well as specified.

Well Casing

Screened Interval

90' Depth to Bottom of Boring

SB-16-09 — 2017 Soil Boring

- 430 Arsenic Concentration (µg/L)
- 47,000 Iron Concentration (µg/L)
- 1,900 Manganese Concentration (µg/L)
- U, J = Laboratory Qualifiers

Sample Interval (1 Foot)

Boring to Refusal

Interpreted Area of Arsenic > CL of 10 µg/L

Interpreted Area of Iron > CL of 9,100 µg/L

Interpreted Area of Manganese > CL of 1,715 µg/L

Water Table Elevations for Monitoring Wells are from November 2020 Well Hydraulic Gauging Event

Sand

Peat

Till

Bedrock

Notes:

1. MSL = Mean Seal Level
2. µg/L = Micrograms per Liter
3. J = Estimated Result
4. U = Non-Detect
5. **Bold** values indicate an exceedance of the Cleanup Levels (CLs)
6. Cross sections and data included in the August 2011 Shepley's Hill Landfill Supplemental Groundwater and Landfill Cap Assessment for Long-Term Monitoring anda Maintenance - Addendum Report by Sovereign Consulting Inc. were referenced in development of this cross section.
7. Geologic and depth to bottom information shown for SB-2017-07 is based on notes during installation of SB-16-07.
8. Depth to bottom of boring not available for SHM-05-40X, SHM-07-05X, EPA-PZ-2012-7A, EPA-PZ-2012-7B, and SHL-12.

2021 Technical Memorandum
Shepley's Hill Landfill
Former Fort Devens Army Installation
Devens, Massachusetts

# DISSOLVED METALS IN GROUNDWATER - NORTH TO SOUTH CROSS SECTION

SERES Engineering & Services, LLC
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Figure 26

CITY: SYRACUSE, NY DIV/GROUP: IMDV DB: M.WASILEWSKI K.DAVIS, R. ALLEN LD: M.WASILEWSKI PIC: K.ABBOTT PM: J.GRAVENMIER TM: A.BAIRD LYR: ON=*;OFF=*REF*
C:\Users\mwasilewski\BIM 360\Arcadis\ANA-USACE\Project Files\DEVENS MA\2021\01-DWG\USACE_SHL - CROSS SECTIONS.dwg LAYOUT: 6 SAVED: 3/16/2021 3:23 PM ACADVER: 23.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 6/9/2021 8:49 AM BY:
WASILEWSKI, MATT
XREFS: IMAGES: PROJECTNAME: ----
section location.JPG
Seres-Arcadis_jvLogo_0.5-in high.jpg

# Attachment 1

**Field Forms (2017 soil boring logs, 2017 low flow forms)**

# Spring 2017 LTM

## Groundwater Water Level Measurement Sheet

**Project/Site Name:** Fort Devens/Shepley's Hill Landfill
**Date :** 5/22/2017
**Field Team Member:** Kevin Anderson, Melissa Miller
**Weather:** Cloudy/Rain 51-57°F
**Water Level Meter Model:** Solinist Model 101

| Area | Well ID | Time (24 hour) | DTW (ft bTOC) | DTB (ft bTOC) | Lock Y/N | Bolts Y/N | Cap Y/N | Well Condition |
|---|---|---|---|---|---|---|---|---|
| Barrier | N1-P1 | 1220 | 14.39 | 73.90 | N | - | Y | |
| Barrier | N1-P2 | 1222 | 13.94 | 32.71 | N | - | Y | |
| Barrier | N1-P3 | 1224 | 13.64 | 20.41 | N | - | Y | |
| Barrier | PZ-12-01 | 0908 | 20.37 | 35.27 | Y | - | Y | |
| Barrier | PZ-12-02 | 0910 | 19.82 | 33.91 | Y | - | Y | |
| Barrier | PZ-12-03 | 0922 | 19.46 | 36.31 | Y | - | Y | |
| Barrier | PZ-12-04 | 0923 | 19.46 | 36.74 | Y | - | Y | |
| Barrier | PZ-12-05 | 0931 | 21.52 | 24.23 | Y | - | Y | |
| Barrier | PZ-12-06 | 0934 | 23.27 | 35.64 | Y | - | Y | |
| Barrier | PZ-12-07 | 0946 | 27.31 | 32.56 | Y | - | Y | |
| Barrier | PZ-12-08 | 0950 | 24.75 | 31.64 | Y | - | Y | |
| Barrier | PZ-12-09 | 0958 | 23.64 | 32.62 | Y | - | Y | |
| Barrier | PZ-12-10 | 1001 | 21.68 | 31.79 | Y | - | Y | |
| Barrier | SHL-10 | 1005 | 30.71 | 38.57 | Y | - | Y | |
| Barrier | SHL-11 | 0913 | 18.44 | 29.68 | Y | - | Y | |
| Barrier | SHL-19 | 0953 | 23.13 | 32.28 | Y | - | Y | |
| Barrier | SHL-20 | 0915 | 17.70 | 50.14 | Y | - | Y | |
| Barrier | SHL-4 | 0938 | 10.51 | 14.53 | Y | - | Y | |
| Barrier | SHM-11-02 | 0936 | 22.29 | 68.27 | Y | - | Y | |
| Barrier | SHM-11-06 | 1552 | 17.81 | 35.48 | Y | - | Y | |
| Barrier | SHP-01-36X | 1215 | 7.60 | 9.82 | N | - | Y | |
| Barrier | SHP-01-37X | 1207 | 6.38 | 8.16 | N | - | Y | |
| Barrier | SHP-01-38A | 1200 | 4.01 | 6.82 | Y | - | Y | |
| Landfill Area | N5-P1 | 1535 | 22.67 | 100.53 | Y | - | Y | |
| Landfill Area | N5-P2 | 1532 | 23.06 | 32.41 | Y | - | Y | |
| Landfill Area | N7-P1 | 1350 | 30.32 | 70.83 | Y | - | Y | |
| Landfill Area | N7-P2 | 1357 | 30.51 | 37.11 | Y | - | Y | |

Checked by LK_4/27/2018

## Groundwater Water Level Measurement Sheet

**Project/Site Name:** Fort Devens/Shepley's Hill Landfill
**Date :** 5/22/2017
**Field Team Member:** Kevin Anderson, Melissa Miller
**Weather:** Cloudy/Rain 51-57°F
**Water Level Meter Model:** Solinist Model 101

| Area | Well ID | Time (24 hour) | DTW (ft bTOC) | DTB (ft bTOC) | Lock Y/N | Bolts Y/N | Cap Y/N | Well Condition |
|---|---|---|---|---|---|---|---|---|
| Landfill Area | SHL-1 | 1405 | 2.69 | 7.81 | N | - | Y | |
| Landfill Area | SHL-18 | 1011 | 18.75 | 28.72 | Y | - | Y | |
| Landfill Area | SHP-95-27X | 1033 | 14.63 | 19.82 | Y | - | Y | |
| Landfill Area | SHP-99-01B | 1415 | 4.73 | 9.74 | Y | - | Y | |
| Landfill Area | SHP-99-01C | 1418 | 9.16 | 31.84 | Y | - | Y | |
| Landfill Area | SHP-2016-07A | 1143 | 14.27 | 31.63 | Y | - | Y | |
| Landfill Area | SHP-2016-07B | 1146 | 22.46 | 80.00 | Y | - | Y | |
| Nearfield Area | EW-1S | 1512 | 14.20 | 43.17 | N | N | N | Missing Well Cap and Bolts |
| Nearfield Area | EW-4S | 1518 | 14.28 | 42.05 | N | N | N | Missing Well Cap and Bolts |
| Nearfield Area | EPA-PZ-2012-1A | 0916 | 10.39 | 28.07 | Y | - | Y | |
| Nearfield Area | EPA-PZ-2012-1B | 0920 | 10.14 | 77.82 | Y | - | Y | |
| Nearfield Area | EPA-PZ-2012-2A | 0927 | 9.98 | 28.38 | Y | - | Y | |
| Nearfield Area | EPA-PZ-2012-2B | 0932 | 10.03 | 83.34 | Y | - | Y | |
| Nearfield Area | EPA-PZ-2012-3A | 908 | 9.80 | 27.75 | Y | - | Y | |
| Nearfield Area | EPA-PZ-2012-3B | 0911 | 9.78 | 77.11 | Y | - | Y | |
| Nearfield Area | EPA-PZ-2012-4A | 0900 | 14.00 | 28.02 | Y | - | Y | |
| Nearfield Area | EPA-PZ-2012-4B | 0904 | 13.93 | 76.95 | Y | - | Y | |
| Nearfield Area | EPA-PZ-2012-5A | 0940 | 7.09 | 77.44 | Y | - | Y | |
| Nearfield Area | EPA-PZ-2012-5B | 0945 | 6.49 | 85.92 | Y | - | Y | |
| Nearfield Area | EPA-PZ-2012-6A | 0855 | 21.53 | 33.34 | Y | - | Y | |
| Nearfield Area | EPA-PZ-2012-6B | 0853 | 22.55 | 81.99 | Y | - | Y | |
| Nearfield Area | EPA-PZ-2012-7A | 0845 | 21.35 | 29.43 | Y | Y | Y | |
| Nearfield Area | EPA-PZ-2012-7B | 0848 | 21.36 | 64.68 | Y | Y | Y | |
| Nearfield Area | SHP-2016-01A | 1022 | 14.25 | 26.17 | N | - | Y | |
| Nearfield Area | SHP-2016-01B | 1024 | 16.47 | 85.62 | N | - | Y | |
| Nearfield Area | SHP-2016-02A | 1327 | 13.40 | 28.49 | N | - | Y | Missing Lock |
| Nearfield Area | SHP-2016-02B | 1333 | 13.40 | 87.97 | N | - | Y | Missing Lock |

Checked by LK_4/27/2018

## Groundwater Water Level Measurement Sheet

**Project/Site Name:** Fort Devens/Shepley's Hill Landfill
**Date :** 5/22/2017
**Field Team Member:** Kevin Anderson, Melissa Miller
**Weather:** Cloudy/Rain 51-57°F
**Water Level Meter Model:** Solinist Model 101

| Area | Well ID | Time (24 hour) | DTW (ft bTOC) | DTB (ft bTOC) | Lock Y/N | Bolts Y/N | Cap Y/N | Well Condition |
|---|---|---|---|---|---|---|---|---|
| Nearfield Area | SHP-2016-03A | 1010 | 10.58 | 27.55 | N | - | Y | Missing Lock |
| Nearfield Area | SHP-2016-03B | 1015 | 10.52 | 87.65 | N | - | Y | Missing Lock |
| Nearfield Area | SHP-2016-04A | 1300 | 17.40 | 32.80 | N | - | Y | Missing Lock |
| Nearfield Area | SHP-2016-04B | 1314 | 17.25 | 92.70 | N | - | Y | Missing Lock |
| Nearfield Area | SHP-2016-05A | 1318 | 14.43 | 32.85 | N | - | Y | Missing Lock |
| Nearfield Area | SHP-2016-05B | 1322 | 14.40 | 92.43 | N | - | Y | Missing Lock |
| Nearfield Area | SHP-2016-06A | 1124 | 26.35 | 85.72 | Y | - | Y | |
| Nearfield Area | SHP-2016-06B | 1127 | 19.80 | 111.94 | Y | - | Y | |
| Nearfield Area | SHP-2016-06C | 1130 | 19.75 | 132.80 | Y | - | Y | |
| Nearfield Area | SHL-23 | 1113 | 26.79 | 35.63 | Y | - | Y | Casing has a broken hinge |
| Nearfield Area | SHM-05-41B | 1348 | 9.99 | 69.90 | N | Y | Y | |
| Nearfield Area | SHM-05-41C | 1340 | 10.15 | 88.77 | N | Y | Y | |
| Nearfield Area | SHM-10-16 | 1039 | 18.25 | 81.38 | Y | - | Y | |
| Nearfield Area | SHM-93-22B | 1001 | 7.65 | 92.68 | Y | - | Y | |
| Nearfield Area | SHM-96-5B | 0952 | 5.76 | 89.45 | Y | - | Y | |
| NIA Area | SHM-05-40X | 1358 | 13.67 | 33.65 | N | N | Y | Needs Bolts, Plug Damaged |
| NIA Area | SHM-07-03 | 1407 | 19.02 | 33.35 | N | N | Y | Needs Bolts, Plug Damaged |
| NIA Area | SHM-07-05X | 1402 | 16.10 | 64.75 | N | N | Y | Needs Bolts |
| NIA Area | SHM-13-03 | 1448 | 5.03 | 51.90 | Y | - | Y | Casing has a broken hinge |
| NIA Area | SHM-13-04 | 1500 | 18.47 | 30.10 | N | Y | Y | |
| NIA Area | SHM-13-06 | 1421 | 35.78 | 45.79 | N | Y | Y | |
| NIA Area | SHM-13-07 | 1440 | 18.19 | 35.23 | N | Y | Y | |
| NIA Area | SHM-13-08 | 1432 | 19.78 | 64.41 | N | Y | Y | |
| West of SHL | 20-1 | 1441 | 17.78 | 55.94 | N/A | - | Y | |
| West of SHL | 27-1 | 1447 | 11.72 | 66.04 | N/A | - | N | Missing gripper cap. |
| West of SHL | 27-2 | 1449 | 19.40 | 69.44 | N/A | - | Y | |
| West of SHL | CAP-2B | 1515 | 7.36 | 11.29 | N/A | - | Y | |

Checked by LK_4/27/2018

## Groundwater Water Level Measurement Sheet

**Project/Site Name:** Fort Devens/Shepley's Hill Landfill
**Date :** 5/22/2017
**Field Team Member:** Kevin Anderson, Melissa Miller
**Weather:** Cloudy/Rain 51-57°F
**Water Level Meter Model:** Solinist Model 101

| Area | Well ID | Time (24 hour) | DTW (ft bTOC) | DTB (ft bTOC) | Lock Y/N | Bolts Y/N | Cap Y/N | Well Condition |
|---|---|---|---|---|---|---|---|---|
| West of SHL | CH-1D | 1522 | 8.09 | 47.00 | N | - | Y | Missing Lock |
| West of SHL | CH-1S | 1525 | 8.42 | 11.75 | N | - | Y | Missing Lock |
| West of SHL | MW-1 | 1518 | 8.31 | 57.82 | N | - | N | Missing Lock and gripper cap. |
| West of SHL | MW-11A | 1458 | Dry | 8.69 | N | - | N | No gripper cap |
| West of SHL | MW-14 | 1459 | 6.47 | 11.72 | N | - | N | No gripper cap |
| West of SHL | MW-16 | 1439 | Dry | 9.36 | N | - | Y | PVC above casing |
| West of SHL | MW-22 | 1444 | 6.13 | 8.41 | N | - | Y | PVC above casing |
| West of SHL | MW-4-1 | 1513 | 3.26 | 7.27 | N | - | Y | No gripper cap |
| West of SHL | MW-7 | 1502 | 6.03 | 11.64 | N | - | N | No gripper cap |
| West of SHL | MW-9 | 1509 | 9.21 | 11.78 | N | - | N | No gripper cap |
| West of SHL | Q4-1 | 1435 | 9.79 | 41.89 | N/A | - | Y | |
| West of SHL | Q5-1 | 1454 | 5.27 | 52.98 | N/A | - | Y | |
| West of SHL | Well 3-2 | 1431 | 25.39 | 58.02 | N/A | - | Y | |
| Upgradient | SHL-12 | 1130 | 21.91 | 28.36 | Y | - | Y | |
| Upgradient | SHL-15 | 1111 | 16.63 | 25.39 | Y | - | Y | |
| Upgradient | SHL-17 | 1137 | 7.04 | 17.98 | N | - | Y | |
| Upgradient | SHL-24 | 1026 | 15.37 | 119.88 | Y | - | Y | |
| Upgradient | SHL-7 | 1614 | 17.64* | 24.48* | Y | - | Y | * To top of steal casing. (Steel To PVC is 1.78' |
| Upgradient | SHM-93-18B | 1013 | 18.42 | 90.62 | Y | - | Y | |
| Upgradient | SHM-93-24A | 1023 | 15.71 | 25.56 | Y | - | Y | |
| Upgradient | 32M-01-14XOB | 1119 | 21.14 | 29.64 | Y | - | Y | Dedicated Pump |
| Upgradient | 32M-92-01X | 1055 | 16.11 | 25.71 | Y | - | Y | |
| Upgradient | 32Z-01-07XOB | 1114 | 13.99 | 24.65 | N | - | Y | |
| Upgradient | SHL-25 | 1126 | 25.06 | 35.93 | Y | - | Y | |

Note: bTOC - below top of casing; all measurements from PVC Riser/TOC unless otherwise noted

Checked by LK_4/27/2018

## Groundwater Water Level Measurement Elevation Sheet

**Project/Site Name:** Fort Devens/Shepley's Hill Landfill **Date :** 5/22/2017

**Field Team Member:** Kevin Anderson, Melissa Miller **Weather:** Cloudy/Rain 51-57°F

**Water Level Meter Model:** Solinist Model 101

| Area | Well ID | TOR Elevation (ft) | DTW (ft bTOR) | Groundwater Elevations (ft b TOR) | Comment |
|---|---|---|---|---|---|
| Barrier | N1-P1 | 229.92 | 14.39 | 215.53 | |
| Barrier | N1-P2 | 229.93 | 13.94 | 215.99 | |
| Barrier | N1-P3 | 230.08 | 13.64 | 216.44 | |
| Barrier | PZ-12-01 | 237.55 | 20.37 | 217.18 | |
| Barrier | PZ-12-02 | 237.79 | 19.82 | 217.97 | |
| Barrier | PZ-12-03 | 236.40 | 19.46 | 216.94 | |
| Barrier | PZ-12-04 | 238.20 | 19.46 | 218.74 | |
| Barrier | PZ-12-05 | 238.73 | 21.52 | 217.21 | |
| Barrier | PZ-12-06 | 242.18 | 23.27 | 218.91 | |
| Barrier | PZ-12-07 | 244.59 | 27.31 | 217.28 | |
| Barrier | PZ-12-08 | 244.83 | 24.75 | 220.08 | |
| Barrier | PZ-12-09 | 241.93 | 23.64 | 218.29 | |
| Barrier | PZ-12-10 | 242.28 | 21.68 | 220.60 | |
| Barrier | SHL-10 | 248.02 | 30.71 | 217.31 | |
| Barrier | SHL-11 | 235.47 | 18.44 | 217.03 | |
| Barrier | SHL-19 | 240.50 | 23.13 | 217.37 | |
| Barrier | SHL-20 | 235.95 | 17.70 | 218.25 | |
| Barrier | SHL-4 | 227.48 | 10.51 | 216.97 | |
| Barrier | SHM-11-02 | 240.73 | 22.29 | 218.44 | |
| Barrier | SHM-11-06 | 236.17 | 17.81 | 218.36 | |
| Barrier | SHP-01-36X | 223.95 | 7.60 | 216.35 | |
| Barrier | SHP-01-37X | 222.79 | 6.38 | 216.41 | |
| Barrier | SHP-01-38A | 220.86 | 4.01 | 216.85 | |
| Landfill Area | N5-P1 | 242.65 | 22.67 | 219.98 | |
| Landfill Area | N5-P2 | 242.69 | 23.06 | 219.63 | |
| Landfill Area | N7-P1 | 255.59 | 30.32 | 225.27 | |
| Landfill Area | N7-P2 | 256.04 | 30.51 | 225.53 | |

## Groundwater Water Level Measurement Elevation Sheet

**Project/Site Name:** Fort Devens/Shepley's Hill Landfill **Date :** 5/22/2017

**Field Team Member:** Kevin Anderson, Melissa Miller **Weather:** Cloudy/Rain 51-57°F

**Water Level Meter Model:** Solinist Model 101

| Area | Well ID | TOR Elevation (ft) | DTW (ft bTOR) | Groundwater Elevations (ft b TOR) | Comment |
|---|---|---|---|---|---|
| Landfill Area | SHL-1 | 272.27 | 2.69 | 269.58 | |
| Landfill Area | SHL-18 | 237.56 | 18.75 | 218.81 | |
| Landfill Area | SHM-95-27X | 237.45 | 14.63 | 222.82 | |
| Landfill Area | SHP-99-01B | 273.16 | 4.73 | 268.43 | |
| Landfill Area | SHP-99-01C | 274.15 | 9.16 | 264.99 | |
| Landfill Area | SHP-2016-07A | 265.30 | 14.27 | 251.03 | |
| Landfill Area | SHP-2016-07B | 265.33 | 22.46 | 242.87 | |
| Nearfield Area | EW-1S | 226.79 | 14.20 | 212.59 | |
| Nearfield Area | EW-4S | 227.06 | 14.28 | 212.78 | |
| Nearfield Area | EPA-PZ-2012-1A | 223.79 | 10.39 | 213.40 | |
| Nearfield Area | EPA-PZ-2012-1B | 223.53 | 10.14 | 213.39 | |
| Nearfield Area | EPA-PZ-2012-2A | 223.38 | 9.98 | 213.40 | |
| Nearfield Area | EPA-PZ-2012-2B | 223.37 | 10.03 | 213.34 | |
| Nearfield Area | EPA-PZ-2012-3A | 222.65 | 9.80 | 212.85 | |
| Nearfield Area | EPA-PZ-2012-3B | 222.57 | 9.78 | 212.79 | |
| Nearfield Area | EPA-PZ-2012-4A | 226.60 | 14.00 | 212.60 | |
| Nearfield Area | EPA-PZ-2012-4B | 226.39 | 13.93 | 212.46 | |
| Nearfield Area | EPA-PZ-2012-5A | 220.01 | 7.09 | 212.92 | |
| Nearfield Area | EPA-PZ-2012-5B | 219.38 | 6.49 | 212.89 | |
| Nearfield Area | EPA-PZ-2012-6A | 234.25 | 21.53 | 212.72 | |
| Nearfield Area | EPA-PZ-2012-6B | 234.08 | 22.55 | 211.53 | |
| Nearfield Area | EPA-PZ-2012-7A | 234.16 | 21.35 | 212.81 | |
| Nearfield Area | EPA-PZ-2012-7B | 234.03 | 21.36 | 212.67 | |
| Nearfield Area | SHP-2016-01A | 227.27 | 14.25 | 213.02 | |
| Nearfield Area | SHP-2016-01B | 227.24 | 16.47 | 210.77 | |
| Nearfield Area | SHP-2016-02A | 225.93 | 13.40 | 212.53 | |
| Nearfield Area | SHP-2016-02B | 225.95 | 13.40 | 212.55 | |

## Groundwater Water Level Measurement Elevation Sheet

**Project/Site Name:** Fort Devens/Shepley's Hill Landfill **Date :** 5/22/2017

**Field Team Member:** Kevin Anderson, Melissa Miller **Weather:** Cloudy/Rain 51-57°F

**Water Level Meter Model:** Solinist Model 101

| Area | Well ID | TOR Elevation (ft) | DTW (ft bTOR) | Groundwater Elevations (ft b TOR) | Comment |
|---|---|---|---|---|---|
| Nearfield Area | SHP-2016-03A | 223.18 | 10.58 | 212.60 | |
| Nearfield Area | SHP-2016-03B | 223.18 | 10.52 | 212.66 | |
| Nearfield Area | SHP-2016-04A | 229.97 | 17.40 | 212.57 | |
| Nearfield Area | SHP-2016-04B | 229.75 | 17.25 | 212.50 | |
| Nearfield Area | SHP-2016-05A | 227.01 | 14.43 | 212.58 | |
| Nearfield Area | SHP-2016-05B | 226.95 | 14.40 | 212.55 | |
| Nearfield Area | SHP-2016-06A | 241.90 | 26.35 | 215.55 | |
| Nearfield Area | SHP-2016-06B | 241.89 | 19.80 | 222.09 | |
| Nearfield Area | SHP-2016-06C | 241.92 | 19.75 | 222.17 | |
| Nearfield Area | SHL-23 | 241.29 | 26.79 | 214.50 | |
| Nearfield Area | SHM-05-41B | 222.33 | 9.99 | 212.34 | |
| Nearfield Area | SHM-05-41C | 222.57 | 10.15 | 212.42 | |
| Nearfield Area | SHM-10-16 | 219.23 | 18.25 | 200.98 | |
| Nearfield Area | SHM-93-22B | 219.39 | 7.65 | 211.74 | |
| Nearfield Area | SHM-96-5B | 218.92 | 5.76 | 213.16 | |
| NIA Area | SHM-05-40X | 223.34 | 13.67 | 209.67 | |
| NIA Area | SHM-07-03 | 227.90 | 19.02 | 208.88 | |
| NIA Area | SHM-07-05X | 223.40 | 16.10 | 207.30 | |
| NIA Area | SHM-13-03 | 212.05 | 5.03 | 207.02 | |
| NIA Area | SHM-13-04 | 227.02 | 18.47 | 208.55 | |
| NIA Area | SHM-13-06 | 223.89 | ~~35.78~~ | ~~188.11~~ | Incorrect reading, off by 20 ft |
| NIA Area | SHM-13-07 | 225.64 | 18.19 | 207.45 | |
| NIA Area | SHM-13-08 | 227.90 | 19.78 | 208.12 | |
| West of SHL | 20-1 | 278.52 | 17.78 | 260.74 | |
| West of SHL | 27-1 | 270.66 | 11.71 | 258.95 | |
| West of SHL | 27-2 | 275.15 | 19.40 | 255.75 | |
| West of SHL | CAP-2B | 250.21 | 7.36 | 242.85 | |

## Groundwater Water Level Measurement Elevation Sheet

**Project/Site Name:** Fort Devens/Shepley's Hill Landfill **Date :** 5/22/2017

**Field Team Member:** Kevin Anderson, Melissa Miller **Weather:** Cloudy/Rain 51-57°F

**Water Level Meter Model:** Solinist Model 101

| Area | Well ID | TOR Elevation (ft) | DTW (ft bTOR) | Groundwater Elevations (ft b TOR) | Comment |
|---|---|---|---|---|---|
| West of SHL | CH-1D | 250.59 | 8.09 | 242.50 | |
| West of SHL | CH-1S | 250.63 | 8.42 | 242.21 | |
| West of SHL | MW-1 | 251.84 | 8.31 | 243.53 | |
| West of SHL | MW-11A | 258.57 | Dry | -- | |
| West of SHL | MW-14 | 256.61 | 6.47 | 250.14 | |
| West of SHL | MW-16 | 270.27 | Dry | -- | |
| West of SHL | MW-22 | 267.70 | 6.13 | 261.57 | |
| West of SHL | MW-4-1 | 247.33 | 3.26 | 244.07 | |
| West of SHL | MW-7 | 249.10 | 6.03 | 243.07 | |
| West of SHL | MW-9 | 243.91 | 9.21 | 234.70 | |
| West of SHL | Q4-1 | 268.38 | 9.79 | 258.59 | |
| West of SHL | Q5-1 | 260.99 | 5.27 | 255.72 | |
| West of SHL | Well 3-2 | 268.20 | 25.39 | 242.81 | |
| Upgradient | SHL-12 | 248.62 | 21.91 | 226.71 | |
| Upgradient | SHL-15 | 259.92 | 16.63 | 243.29 | |
| Upgradient | SHL-17 | 233.79 | 7.04 | 226.75 | |
| Upgradient | SHL-24 | 238.75 | 15.37 | 223.38 | |
| Upgradient | SHL-7 | 236.33 | 15.86 | 220.47 | * (Steel To PVC is 1.78') Original field reading 17.64' |
| Upgradient | SHM-93-18B | 237.31 | 18.42 | 218.89 | |
| Upgradient | SHM-93-24A | 238.42 | 15.71 | 222.71 | |
| Upgradient | 32M-01-14XOB | 256.56 | 21.14 | 235.42 | |
| Upgradient | 32M-92-01X | 260.17 | 16.11 | 244.06 | |
| Upgradient | 32Z-01-07XOB | 259.48 | 13.99 | 245.49 | |
| Upgradient | SHL-25 | 258.01 | 25.06 | 232.95 | |

Notes:

bTOR: below top of riser

Horizontal Datum: Massachusetts State Plane Coordinate System NAD83*

Vertical Datum: NAVD88

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-23

Project: Shepleys 1024-003 Spr 17 Date: 5/24/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 4" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~ TPVC) | 26.89 | TOC |
| Depth to bottom (ft ~~bgs~~ TPVC) | 35.63 | TOC |
| Screen Interval (ft-bgs) | 23-33 | |
| Total volume purged (gal) | 4.50 | |

**Sampling Type**

Purging Method Bladder Low Flow Tubing type Double Bonded Dedicated pump (Y/N) N

Purge start/stop time 0850/0925 Tubing diameter 1/4" Air source Nitrogen

QED MP10 Controller (MP10-2482) Solinist $H_2O$ Meter (212202) Field Instrument (Model/S/N) YSI 63 MDS (00L1207 AD)

Sample Pro Bladder Pump (27107) Lamotte 2020 we (3456-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0925 | 425 | 28.99 | 8.67 | 5.46 | 0.073 | 10.77 | 83.7 | 11.54 | Clear |
| 0930 | 300 | 28.98 | 8.82 | 5.35 | 0.072 | 10.89 | 72.3 | 9.90 | Clear |
| 0935 | 225 | 26.95 | 9.09 | 5.41 | 0.071 | 10.80 | 61.4 | 9.70 | Clear |
| 0940 | 200 | 26.96 | 9.08 | 5.39 | 0.071 | 10.78 | 59.4 | 7.08 | Clear |
| 0945 | 200 | 26.95 | 9.06 | 5.28 | 0.071 | 10.98 | 58.1 | 7.06 | Clear |
| 0950 | 200 | 26.95 | 9.05 | 5.20 | 0.072 | 11.02 | 55.2 | 6.33 | Clear |
| 0955 | 200 | 26.95 | 9.03 | 5.18 | 0.073 | 11.03 | 54.5 | 6.30 | Clear |
| 1000 | 200 | 26.95 | 9.03 | 5.17 | 0.073 | 11.03 | 54.1 | 6.31 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHL-23-SPR17 @ 1002

Field Filtered (Y/N): Y

Filter Size: .45um

Duplicate (Y/N): N

Dup ID/Time:

SHL-23-MS-SPR17

MS/MSD (Y/N): Y

SHL-23-MSD-SPR17

**Comments** Hinge on casing is Broken

BG

Signature

5/24/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-18

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/1/17
Sampler: MAL

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 4 | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 18.75 | TOC |
| Depth to bottom (ft-~~bgs~~) | 28.72 | TOC |
| Screen Interval (ft-~~bgs~~) | 16-26 | BGS |
| Total volume purged (gal) | 4.0 | |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 1130
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556MPS 07E100124
LaMotte 2020WE A0775

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1130 | 200 | 18.66 | 13.37 | 6.64 | 52 | 9.72 | 144.6 | 5.07 | clear |
| 1135 | ↓ | 18.66 | 13.63 | 6.73 | 52 | 9.51 | 121.7 | 4.90 | ↓ |
| 1140 | ↓ | 18.66 | 13.61 | 6.97 | 50 | 9.13 | 94.7 | 4.86 | ↓ |
| 1145 | ↓ | 18.66 | 13.68 | 6.96 | 50 | 9.09 | 89.6 | 4.85 | ↓ |
| 1150 | ✓ | 18.66 | 13.69 | 6.96 | 50 | 9.03 | 88.4 | 4.88 | ✓ |
| | | | | | | | | | |
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| | | | | | | | | | |

Acceptance Criteria: <0.3ft ±3% ±0.1 ±3% ±10% ± 10mv 10%

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SHL-18-SR17 @ 1155 (BK)

**Signature**

Date 6/1/17

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-93-18B

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/1/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 4" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 18.42 | TOC |
| Depth to bottom (ft ~~bgs~~) | 90.62 | TOC |
| Screen Interval (ft-~~bgs~~) | 78.5-88.5 | BGS |
| Total volume purged (gal) | 4.0 | |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1245
Tubing type: ~~[illegible]~~ poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): [illegible] 07/21 00122 [illegible] 2020WE A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1245 | 200 | 18.31 | 12.38 | 6.55 | 255 | 4.47 | 139.1 | 5.00 | Clear |
| 1250 | ↓ | 18.31 | 12.97 | 6.61 | 259 | 4.36 | 128.1 | 4.23 | ↓ |
| 1255 | ↓ | 18.31 | 12.94 | 6.63 | 260 | 4.34 | 126.9 | 4.19 | ↓ |
| 1300 | ↓ | 18.31 | 12.97 | 6.64 | 261 | 4.31 | 125.4 | 4.18 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SHM-93-18B-SPR17 @ 1305 (BK)

[signature]
**Signature**

6/1/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-7

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/1/17
Sampler: MA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | | ✓ | |
| Bolts present | ✓ | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| ☆ Depth to water (ft-~~bge~~ BGS) | 17.64 |
| ☆ Depth to bottom (ft ~~bge~~ BGS) | 24.78 |
| Screen Interval (ft-~~bge~~) | 11-21 BGS |
| Total volume purged (gal) | 3.0 |

+ 1.78' ☆ PVC to steel casing
+ 1.78'

☆ Depth to steel casing (PVC to steel difference is 1.78')

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 955
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 07E100 pH
LaMotte 2020WP A0 2735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 955 | 200 | ☆ 17.34 | 10.28 | 4.91 | 2.80 | 7.25 | 259.4 | 12.4 | Clear |
| 1000 | ↓ | ☆ 17.34 | 10.39 | 5.49 | 2.79 | 7.18 | 231.6 | 7.37 | ↓ |
| 1005 | ↓ | ☆ 17.34 | 10.41 | 5.34 | 2.77 | 7.14 | 205.4 | 7.05 | ↓ |
| 1010 | ↓ | ☆ 17.34 | 10.43 | 5.41 | 2.75 | 6.82 | 198.8 | 5.13 | ↓ |
| 1015 | ↓ | ☆ 17.34 | 10.47 | 5.48 | 2.74 | 6.84 | 195.6 | 5.09 | ↓ |
| 1020 | ↓ | ☆ 17.34 | 10.50 | 5.46 | 2.76 | 6.87 | 194.7 | 5.03 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): N/A
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N/A

**Comments** SHL-7- SPR17 @ 1025 (BK)

Signature

6/1/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** CAP-2B

Project: 1024-003 Shepleys Spring 2017 Date: 6/5/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | | X | |

no Lock

**Well Information**

| | | |
|---|---|---|
| Diameter | 1" | |
| Material | PVC | |
| Depth to water (ft-bgs) | 8.62 | TOC |
| Depth to bottom (ft-bgs) | 18.30 | TOC |
| Screen Interval (ft-bgs) | 52-57 | |
| Total volume purged (gal) | 3.0 | |

**Sampling Type** Peristaltic

Purging Method: Low Flow Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 935/1000 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1000 | 300 | 23.86 | 10.52 | 6.03 | 0.078 | 5.48 | 70.1 | 17.72 | clear |
| 1005 | 150 | 20.34 | 10.92 | 6.05 | 0.078 | 5.43 | 51.4 | 14.72 | clear |
| 1010 | 150 | 19.66 | 11.13 | 6.06 | 0.078 | 5.53 | 44.9 | 15.70 | Clear |
| 1015 | 150 | 19.45 | 11.05 | 6.00 | 0.078 | 5.64 | 39.7 | 13.66 | Clear |
| 1020 | 150 | 19.49 | 11.07 | 5.95 | 0.078 | 5.64 | 38.8 | 11.31 | Clear |
| 1025 | 150 | 19.50 | 11.10 | 5.93 | 0.078 | 5.63 | 39.0 | 11.24 | Clear |
| 1030 | 150 | 19.51 | 11.12 | 5.90 | 0.078 | 5.59 | 37.7 | 11.17 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

CAP-2B-SPR17

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45 µm Dup ID/Time:

Sample Time: 1032

Comments Dedicated Tubing

BK

Melissa A Miller

Signature

6/5/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** CH-1D

Project: 1024-003 Shepleys Spring 2017 | Date: 6/5/17

Location: Fort Devens Massachusetts | Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1.5 |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 8.24 |
| Depth to bottom (ft-~~bgs~~ TOC) | 97.46 |
| Screen Interval (ft-bgs) | 85-95 |
| Total volume purged (gal) | 4.75 |

**Sampling Type**

Purging Method: Peristaltic Low Flow | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 1106/1120 | Tubing diameter: 1/4" / 1/2" | Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters** 1D | 1S

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1120 | 400 | 29.80 | 8.59 | 11.17 | 7.22 | 0.308 | 1.39 | -49.2 | 21.37 | cloudy/clear |
| 1125 | 125 | 29.52 | 8.59 | 11.20 | 7.25 | 0.308 | 1.42 | -50.0 | 21.02 | cloudy/clear |
| 1130 | 125 | 29.08 | 8.59 | 11.31 | 7.29 | 0.307 | 1.52 | -50.2 | 20.84 | cloudy/clear |
| 1135 | 125 | 28.72 | 8.59 | 11.81 | 7.37 | 0.307 | 1.78 | -58.1 | 25.47 | cloudy/clear |
| 1140 | 125 | 28.11 | 8.59 | 12.08 | 7.42 | 0.307 | 1.86 | -68.7 | 25.42 | cloudy/clear |
| 1145 | 125 | 27.25 | 8.59 | 12.10 | 7.46 | 0.308 | 1.80 | -78.2 | 24.74 | cloudy/clear |
| 1150 | 100 | 26.73 | 8.59 | 12.30 | 7.47 | 0.309 | 1.48 | -80.3 | 10.02 | clear |
| 1155 | 100 | 26.65 | 8.59 | 12.25 | 7.50 | 0.309 | 1.44 | -85.9 | 9.98 | clear |
| 1200 | 100 | 26.58 | 8.59 | 12.27 | 7.52 | 0.309 | 1.45 | -89.7 | 9.89 | clear |
| 1205 | 100 | 26.49 | 8.59 | 12.25 | 7.53 | 0.309 | 1.44 | -85.9 | 9.80 | clear |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

CH-1D-SPR17

Field Filtered (Y/N): Y | Duplicate (Y/N): Y | MS/MSD (Y/N): N

Filter Size: .45 um | Dup ID/Time: 1212

Sample Time: 1207 | SHL-BG DUP 05-SPR17

Comments Needs lock, Dedicated tubing. Duplicate

Melissa A Miller

Signature

6/5/17

Date

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** CH-1S

Project: 1024-003 Shepleys Spring 2017 | Date: 6/5/17

Location: Fort Devens Massachusetts | Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 1" | |
| Material | PVC | |
| Depth to water (ft-bgs) TOC | 8.59 | TOC |
| Depth to bottom (ft-bgs) TOC | 43.14 | TOC |
| Screen Interval (ft-bgs) | 36-41 ft | |
| Total volume purged (gal) | 3.25 | |

**Sampling Type**

Purging Method: Peristaltic Low flow | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 1317/1327 | Tubing diameter: 1/4" | Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) 1S | Depth to Water (ft) 1D | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1327 | 250 | 8.89 | 14.19 | 10.73 | 7.32 | 0.105 | 8.36 | 59.4 | 83.13 | cloudy |
| 1332 | 175 | 8.76 | 13.80 | 11.04 | 7.10 | 0.106 | 7.90 | 48.3 | 50.12 | cloudy |
| 1337 | 150 | 8.81 | 13.56 | 11.33 | 7.04 | 0.106 | 7.87 | 42.7 | 46.81 | cloudy |
| 1342 | 150 | 8.75 | 12.12 | 11.35 | 6.96 | 0.106 | 7.70 | 41.1 | 39.00 | cloudy |
| 1347 | 150 | 8.73 | 11.50 | 11.32 | 6.87 | 0.108 | 7.70 | 40.8 | 35.74 | cloudy / clear |
| 1352 | 150 | 8.76 | 11.43 | 11.15 | 6.79 | 0.106 | 7.50 | 40.5 | 32.92 | cloudy / clear |
| 1357 | 150 | 8.73 | 11.40 | 11.14 | 6.77 | 0.105 | 7.50 | 40.1 | 28.73 | cloudy clear |
| 1402 | 150 | 8.74 | 11.38 | 11.16 | 6.75 | 0.105 | 7.50 | 40.0 | 22.69 | cloudy, clear |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

CH-1S_SPR17

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): N

Filter Size: .45 µm | Dup ID/Time:

Sample Time: 1404

Comments: needs Low. Replaced tubing, Flow rate cannot go below 150, pump stops.

Melissa Miller

Signature

6/5/17

Date

BLG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-1

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/5/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 2.69 | TOC |
| Depth to bottom (ft ~~bgs~~) | 7.81 | TOC |
| Screen Interval (ft-~~bgs~~) | 2-5 | BGS |
| Total volume purged (gal) | 3.0 | |

**Sampling Type**

Purging Method: geoprobe
Purge start/stop time: 915
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 07 6100 112
LaMotte 2020WP A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 915 | 75 | 4.21 | 10.55 | 4.30 | 53 | 0.87 | 130.9 | 6.79 | clear |
| 920 | ↓ | 4.21 | 10.59 | 4.60 | 42 | 0.85 | 97.9 | 5.89 | ↓ |
| 925 | ↓ | 4.21 | 10.61 | 4.62 | 46 | 0.84 | 88.7 | 5.73 | ↓ |
| 930 | ↓ | 4.21 | 10.56 | 4.70 | 44 | 0.80 | 79.6 | 5.00 | ↓ |
| 935 | ↓ | 4.21 | 10.55 | 4.71 | 43 | 0.72 | 76.2 | 4.77 | ↓ |
| 940 | ↓ | 4.21 | 10.57 | 4.70 | 42 | 0.71 | 74.7 | 4.73 | ↓ |
| 945 | ↓ | 4.21 | 10.00 | 4.69 | 41 | 0.69 | 74.2 | 4.70 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 1.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SHL-1-SPR17 @ 950 (BK)

[signature]
**Signature**

6/5/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-99-01C

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/5/17
Sampler: MA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 9.16 | TOC |
| Depth to bottom (ft ~~bgs~~) | 31.84 | TOC |
| Screen Interval (ft-~~bgs~~) | 19.7-29.7 | BGS |
| Total volume purged (gal) | 3.0 | |

**Sampling Type**

Purging Method: peristaltic
Purge start/stop time: 12:30
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 07 61 00122
LaMotte 2020we A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1230 | 150 | 12.28 | 8.41 | 5.19 | 96 | 1.34 | 83.1 | 6.02 | clear |
| 1235 | 75 | 11.99 | 8.46 | 5.45 | 79 | 4.97 | 79.9 | 5.07 | ↓ |
| 1240 | ↓ | 11.97 | 8.47 | 5.61 | 67 | 5.71 | 84.5 | 4.92 | ↓ |
| 1245 | ↓ | 11.96 | 8.69 | 5.59 | 60 | 5.60 | 79.6 | 4.90 | ↓ |
| 1250 | ↓ | 11.96 | 9.00 | 5.58 | 57 | 5.52 | 72.5 | 4.87 | ↓ |
| 1255 | ↓ | 11.96 | 9.03 | 5.60 | 54 | 5.50 | 73.6 | 4.77 | ↓ |
| 1300 | ↓ | 11.96 | 9.04 | 5.61 | 53 | 5.49 | 73.9 | 4.73 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |

| Acceptance Criteria: | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% |
|---|---|---|---|---|---|---|---|

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SHP-99-01C-SPR17 @ 1305 (BR)

Signature

6/5/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-99-01B

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/5/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 4.73 | TOC |
| Depth to bottom (ft ~~bgs~~) | 9.74 | TOC |
| Screen Interval (ft-~~bgs~~) | 4-8 | BGS |
| Total volume purged (gal) | 3.0 | |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1030
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI556 MPS 07 [illegible]
Lamotte 2020-B

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1030 | 75 | 6.72 | 10.32 | 4.94 | 81 | 0.47 | 53.2 | 20.3 | Semi cloudy |
| 1035 | ↓ | 6.84 | 10.42 | 5.07 | 80 | 0.47 | 51.6 | 19.6 | ↓ |
| 1040 | ↓ | 6.89 | 10.43 | 5.06 | 80 | 0.46 | 49.7 | 19.7 | ↓ |
| 1045 | ↓ | 6.96 | 10.41 | 5.06 | 80 | 0.47 | 48.4 | 19.4 | ↓ |
| 1050 | ↓ | 6.99 | 10.42 | 5.07 | 79 | 0.46 | 47.9 | 19.6 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N/A

**Comments** SHP-99-01B- SPR17 @ 1055 (BK)

[signature]
**Signature**

6/5/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** 27-1_SPS17

Project: 1024-003 Shepleys Spring 2017
Location: Fort Devens Massachusetts

Date: 6/5/17
Sampler: Ian Valentino

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | X | |
| Locked (stickup wells) | | X | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2in | |
| Material | PVC | |
| Depth to water (ft ~~bgs~~) | 12.41 | TOC |
| Depth to bottom (ft ~~bgs~~) | 66.04 | TOC |
| Screen Interval (ft-bgs) | ~~58.25~~ ~~63.25~~ | 58.25 – 63.25 |
| Total volume purged (gal) | 5 gal | |

**Sampling Type**

Purging Method: Peristaltic
Purge start/stop time: 0935/1040
Tubing type: LDPE
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: NA

Field Instrument (Model/S/N): YSI 556 (11362413), GEO Pump (Pine ID 11870), Solinist H2O Meter (18174), Lamotte 2020we (3597-3513)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0945 | 800 | 13.41 | 6.73 | 6.22 | 0.059 | 10.58 | 218.8 | 2.40 | Clear |
| 0950 | 500 | 13.11 | 6.77 | 6.08 | 0.060 | 10.22 | 209.8 | 1.33 | Clear |
| 0955 | 325 | 12.86 | 6.91 | 6.00 | 0.061 | 10.00 | 204.8 | 1.22 | Clear |
| 1000 | 250 | 12.70 | 7.04 | 6.00 | 0.061 | 9.62 | 199.5 | 0.67 | Clear |
| 1005 | 175 | 12.65 | 7.20 | 6.02 | 0.062 | 9.48 | 191.2 | 0.87 | Clear |
| 1010 | 175 | 12.65 | 7.18 | 6.00 | 0.062 | 9.41 | 203.3 | 0.83 | Clear |
| 1015 | 175 | 12.65 | 7.16 | 5.99 | 0.062 | 9.34 | 191.4 | 0.63 | Clear |
| 1020 | 175 | 12.65 | 7.16 | 5.99 | 0.062 | 9.23 | 183.5 | 0.98 | Clear |
| 1025 | 175 | 12.65 | 7.16 | 5.99 | 0.061 | 9.18 | 182.3 | 0.74 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

27-1-SPS17
Field Filtered (Y/N): Y
Filter Size: 0.45 µ
Sample Time: 1027
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Comments

Signature

6/5/17
Date

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** 27-2_SPR17

Project: 1024-003 Shepleys Spring 2017 | Date: 6/5/17

Location: Fort Devens Massachusetts | Sampler: Ian Valentino

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | |
| Locked (stickup wells) | | X | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2in | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 19.89 | TOC |
| Depth to bottom (ft ~~bgs~~) | 69.44 | TOC |
| Screen Interval (ft-bgs) | 58-68 | |
| Total volume purged (gal) | 4 gal | |

**Sampling Type**

Purging Method: Peristaltic | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 11:00 | Tubing diameter: 1/4" | Air source: NA

Field Instrument (Model/S/N): YSI (11J02413), GEO Pump (Pine ID 11870, Solinist H2O Meter (1874), Lamotte 2020we (3597-8513)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1110 | 650 | 21.9 | 6.88 | 5.70 | 0.049 | 6.29 | 178.7 | 24.0 | Cloudy |
| 1115 | 250 | 21.31 | 6.87 | 5.79 | 0.049 | 6.28 | 171.7 | 23.9 | Cloudy |
| 1120 | 175 | 20.81 | 6.93 | 5.83 | 0.050 | 6.14 | 174.8 | 18.9 | Cloudy |
| 1125 | 175 | 20.55 | 7.03 | 5.87 | 0.050 | 6.06 | 179.5 | 12.2 | Clear |
| 1130 | 175 | 20.55 | 7.22 | 5.92 | 0.048 | 6.02 | 172.8 | 8.71 | Clear |
| 1135 | 175 | 20.55 | 7.02 | 5.91 | 0.048 | 6.07 | 174.2 | 6.53 | clear |
| 1140 | 175 | 20.55 | 7.01 | 5.90 | 0.049 | 6.06 | 172.4 | 5.33 | Clear |
| 1145 | 175 | 20.55 | 6.97 | 5.91 | 0.049 | 6.06 | 172.0 | 4.44 | Clear |
| 1150 | 175 | 20.55 | 6.98 | 5.92 | 0.048 | 6.04 | 170.7 | 3.85 | clear |
| 1155 | 175 | 20.55 | 6.99 | 5.93 | 0.049 | 6.04 | 168.5 | 3.43 | Clear |
| 1200 | 175 | 20.55 | 6.99 | 5.93 | 0.049 | 5.93 | 167.7 | 3.51 | clear |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

27-2_SPR-17

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): N

Filter Size: 0.45 | Dup ID/Time: NA

Sample Time: 1202

BG

**Comments**

[signature] | 6/5/17

**Signature** | Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** 20-1_SPS17

Project: 1024-003 Shepleys Spring 2017 | Date: 6/5/17

Location: Fort Devens Massachusetts | Sampler: Ian Valentino

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | |
| Locked (stickup wells) | | X | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2 in | |
| Material | PVC | |
| Depth to water (ft ~~bgs~~) | 18.31 | TOC |
| Depth to bottom (ft ~~bgs~~) | 55.94 | TOC |
| Screen Interval (ft-bgs) | 40-55 | |
| Total volume purged (gal) | 3 gal | |

**Sampling Type**

Purging Method: Peristaltic | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 1238 | Tubing diameter: 1/4" | Air source: NA

Field Instrument (Model/S/N): YSI 551 (11302413), GEO Pump (Pine ID 11870), Solinist H2O Meter (11874), Lamotte 2020we (3597-7513)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1248 | 375 | 22.61 | 6.68 | 5.73 | 0.274 | 5.04 | 142.3 | 9.38 | Clear |
| 1253 | 150 | 23.46 | 6.87 | 6.90 | 0.269 | 4.87 | 136.9 | 5.10 | Clear |
| 1258 | 150 | 23.46 | 7.06 | 7.05 | 0.268 | 4.97 | 132.3 | 4.33 | Clear |
| 1303 | 150 | 23.46 | 7.12 | 7.13 | 0.265 | 4.98 | 131.3 | 2.97 | Clear |
| 1308 | 150 | 23.46 | 7.16 | 7.24 | 0.265 | 5.03 | 132.0 | 1.89 | Clear |
| 1313 | 150 | 23.46 | 7.18 | 7.27 | 0.265 | 5.24 | 130.8 | 1.76 | Clear |
| 1318 | 150 | 23.46 | 7.20 | 7.30 | 0.265 | 5.31 | 128.1 | 1.66 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

20-1_SPS17

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): N

Filter Size: 0.45 | Dup ID/Time: FA

Sample Time: 1321

**omments** BG

Signature

6/5/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-05-40X

Project: 1024-003 Shepleys Spring 2017 Date: 6/6/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | X | ~~NA~~ |
| Locked (stickup wells) | | | X |

Damaged

**Well Information**

| | | |
|---|---|---|
| Diameter | 2" | |
| Material | PVC | |
| Depth to water (ft-bgs) TOC | 15.76 | TOC |
| Depth to bottom (ft bgs) TOC | 33.65 | TOC |
| Screen Interval (ft-bgs) | 32-34 | Ft bgS |
| Total volume purged (gal) | 6.50 | |

* Riser extension 1.06'

**Sampling Type**

Purging Method: Peristaltic Low Flow Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 1140 / 1210 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1210 | 450 | 26.17 | 11.46 | 7.61 | 0.041 | 7.14 | 80.6 | 658 | Cloudy/Grey |
| 1215 | 200 | 27.23 | 11.59 | 7.54 | 0.041 | 6.49 | 70.6 | 60.98 | Cloudy/white |
| 1220 | 200 | 27.69 | 11.60 | 7.45 | 0.042 | 6.10 | 69.2 | 56.10 | Cloudy/white |
| 1225 | 200 | 28.17 | 11.54 | 7.39 | 0.043 | 5.90 | 68.1 | 50.79 | cloudy/white |
| 1230 | 125 | 27.13 | 11.58 | 7.32 | 0.043 | 5.37 | 68.8 | 49.98 | cloudy/white |
| 1235 | 125 | 26.98 | 11.55 | 7.25 | 0.044 | 5.23 | 67.0 | 46.79 | cloudy/white |
| 1240 | 125 | 26.53 | 11.52 | 7.23 | 0.045 | 5.25 | 68.1 | 46.19 | cloudy/whit |
| 1245 | 125 | 26.52 | 11.63 | 7.13 | 0.046 | 4.99 | 70.2 | 40.31 | cloudy/clea |
| 1250 | 125 | 26.52 | 11.65 | 7.10 | 0.046 | 5.01 | 72.2 | 40.28 | cloudy/clear |
| 1255 | 125 | 26.52 | 11.66 | 7.10 | 0.046 | 5.09 | 71.6 | 40.27 | cloudy/clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

SHM-05-40X_SPR17

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): Y MS/MSD (Y/N): N

Filter Size: .45 um Dup ID/Time: 1302

Sample Time: 1257 SHL-BGDUP03_SPR17

**omments** * Riser Attached to well, due to flood, Riser Hieght. Replaced tubing needs new gripper cap

Melissa Miller

**Signature**

6/6/17

Date

BS

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMP-95-27X

Project: SMR
Location: Fort Devens Massachusetts

Date: 6/6/17
Sampler: MBR

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 1" | |
| Material | PVC | |
| Depth to water (ft ~~bgs~~) | 14.63 | TOC |
| Depth to bottom (ft ~~bgs~~) | 19.82 | TOC |
| Screen Interval (ft ~~bgs~~) | 305-405 | BGS |
| Total volume purged (gal) | 3.0 | |

**Sampling Type**

Purging Method: peristaltic
Purge start/stop time: 1350
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 07K101222
LaMotte 2020we A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1350 | 200 | 14.77 | 9.06 | 6.21 | 72 | 0.29 | -21.0 | 8.08 | Clear |
| 1355 | ↓ | 14.77 | 9.12 | 6.15 | 69 | 0.28 | -22.1 | 7.29 | ↓ |
| 1400 | ↓ | 14.77 | 9.11 | 6.16 | 67 | 0.27 | -23.5 | 6.03 | ↓ |
| 1405 | ↓ | 14.77 | 9.13 | 6.16 | 67 | 0.27 | -26.7 | 5.33 | ↓ |
| 1410 | ↓ | 14.77 | 9.15 | 6.18 | 66 | 0.27 | -26.9 | 5.29 | ↓ |
| 1415 | ↓ | 14.77 | 9.17 | 6.19 | 66 | 0.26 | -27.1 | 5.28 | ↓ |
| | | | | | | | | | |
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Acceptance Criteria: <0.3ft ±3% ±0.1 ±3% ±10% ± 10mv 10%

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SMP-95-27X - SPR17 @1420 (BK)
(D) 250mL bmw Inc. Bottle collected

Signature

Date 6/6/17

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-13-04

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/6/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 18.47 | TOC |
| Depth to bottom (ft-~~bgs~~) | 30.10 | TOC |
| Screen Interval (ft-~~bgs~~) | 20-30 | BGS |
| Total volume purged (gal) | 3.0 | |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1200
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): [illegible] 07[illegible] [illegible] GoMotte 2020 NE A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1200 | 200 | 18.49 | 9.51 | 6.21 | 633 | 4.54 | 59.1 | 17.6 | Clear |
| 1205 | ↓ | 18.49 | 9.50 | 6.31 | 620 | 4.13 | 62.4 | 12.6 | ↓ |
| 1210 | ↓ | 18.49 | 9.46 | 6.30 | 619 | 4.02 | 67.1 | 13.1 | ↓ |
| 1215 | ↓ | 18.49 | 9.51 | 6.31 | 619 | 4.00 | 68.9 | 13.0 | ↓ |
| 1220 | ↓ | 18.49 | 9.53 | 6.32 | 617 | 3.97 | 69.9 | 12.9 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SHM-13-04-SPR17 @ 1225 (BK)

[signature] (1) 250ml Glass Inc. bottle collected.

**Signature**

6/6/17
**Date**

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** N1-P1

Project: 1024-003 Shepleys Spring 2017 | Date: 6/7/17

Location: Fort Devens Massachusetts | Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | | X | X |
| PVC casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | X | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 13.5 |
| Depth to bottom (ft ~~bgs~~ TOC) | 73.9 |
| Screen Interval (ft-bgs) | 65-70 |
| Total volume purged (gal) | 3.75 |

gravel

**Sampling Type** Low flow

Purging Method: Peristaltic | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 920 / 940 | Tubing diameter: 1/4" | Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 940 | 300 | 15.70 | 12.05 | 6.95 | 0.521 | 0.61 | -3.2 | 22.05 | Cloudy / white |
| 945 | 200 | 14.98 | 12.08 | 6.89 | 0.526 | 0.46 | -3.3 | 18.80 | Cloud / Clear |
| 950 | 200 | 14.84 | 12.17 | 6.86 | 0.528 | 0.43 | -3.4 | 16.32 | Clear |
| 9:55 | 200 | 14.72 | 12.14 | 6.85 | 0.529 | 0.43 | -3.5 | 15.71 | Clear |
| 10:00 | 200 | 14.70 | 12.13 | 6.84 | 0.530 | 0.42 | -2.9 | 14.08 | Clear |
| 10:05 | 200 | 14.67 | 12.14 | 6.83 | 0.531 | 0.41 | -2.7 | 13.22 | Clear |
| 10:10 | 200 | 14.70 | 12.13 | 6.83 | 0.532 | 0.40 | -2.9 | 13.20 | Clear |
| 1015 | 200 | 14.70 | 12.14 | 6.83 | 0.531 | 0.39 | -2.5 | 13.17 | Clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

N1-P1-SPR17

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): N

Filter Size: .45µ | Dup ID/Time:

Sample Time: 1017

Comments Pump Does not opperate under 200 ml/min, Replaced tubing

Melissa Miller

Signature

6/7/17

Date

BO

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** N1-P2

Project: 1024-003 Shepleys Spring 2017
Location: Fort Devens Massachusetts

Date: 6/7/17
Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | | ~~X~~ | X |
| PVC casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | X | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 13.65 |
| Depth to bottom (ft ~~bgs~~ TOC) | 48.32 |
| Screen Interval (ft-bgs) | 40-45 |
| Total volume purged (gal) | 3.25 |

grave

**Sampling Type**

Purging Method: ~~10107~~ Peristaltic Low flow
Tubing type: LDPE
Dedicated pump (Y/N): N
Purge start/stop time: 1040/1055
Tubing diameter: 1/4"
Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1055 | 400 | 13.85 | 13.12 | 6.86 | 0.489 | 0.33 | -84.7 | 17.31 | clear |
| 1100 | 200 | 13.75 | 13.46 | 6.91 | 0.494 | 0.38 | -84.6 | 15.88 | clear |
| 1105 | 200 | 13.76 | 13.47 | 6.91 | 0.500 | 0.35 | -73.6 | 10.19 | clear |
| 1110 | 200 | 13.76 | 13.48 | 6.90 | 0.499 | 0.30 | -76.7 | 9.91 | clear |
| 1115 | 200 | 13.75 | 13.49 | 6.89 | 0.498 | 0.30 | -74.0 | 9.80 | clear |
| 1120 | 200 | 13.76 | 13.50 | 6.89 | 0.499 | 0.31 | -74.2 | 9.75 | clear |
| 1125 | 200 | 13.76 | 13.49 | 6.89 | 0.498 | 0.32 | -73.9 | 9.73 | clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

N1-P2-SPR17
Field Filtered (Y/N): Y
Duplicate (Y/N): N
MS/MSD (Y/N): N
Filter Size: .45um
Dup ID/Time:
Sample Time: 1127

Comments: Replaced tubing, Pump does not operate under 200 ml/min

Signature

6/7/17
Date

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** N1-P3_SPM17

Project: 1024-003 Shepleys Spring 2017
Location: Fort Devens Massachusetts

Date: 6/7/17
Sampler: Ian Vollertsen

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | | X |
| Locked (stickup wells) | | X | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 1" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 13.31 | TOC |
| Depth to bottom (ft ~~bgs~~) | 21 | TOC |
| Screen Interval (ft-bgs) | 12~17 | |
| Total volume purged (gal) | 7 | |

**Sampling Type**

Purging Method: Peristaltic
Purge start/stop time: 0924/1110
Tubing type: LDPE
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: NA

Field Instrument (Model/S/N): YSI 556 (11J0243), GEO Pump (Pine ID 1870, Solinist H2O Meter (18174),
Lamotte 2020we (3597-3513)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0940 | 800 | 13.50 | 5.88 | 9.61 | 0.432 | 2.22 | -553.5 | 21.7 | Cloudy/red |
| 0945 | 375 | 13.45 | 6.09 | 9.36 | 0.429 | 2.14 | -556.2 | 11.46 | Cloudy/red |
| 0950 | 250 | 13.41 | 6.35 | 15.20 | 0.425 | 1.95 | -575.4 | 21.5 | Cloudy/red |
| 0955 | 250 | 13.41 | 6.44 | 15.37 | 0.425 | 1.94 | -592.3 | 28.7 | Cloudy/red |
| 1000 | 250 | 13.41 | 6.45 | 12.24 | 0.423 | 1.85 | -443 | 19.2 | Cloudy |
| 1005 | 250 | 13.41 | 6.41 | 9.82 | 0.420 | 1.92 | -434.0 | 13.5 | Cloudy |
| 1010 | 250 | 13.41 | 6.42 | 9.11 | 0.420 | 1.85 | -426.8 | 23.5 | Cloudy |
| 1015 | 250 | 13.41 | 6.46 | 8.82 | 0.420 | 1.98 | -419.4 | 17.1 | Cloudy |
| 1020 | 250 | 13.41 | 6.52 | 8.56 | 0.418 | 1.96 | -360.7 | 15.6 | Cloudy |
| 1025 | 250 | 13.41 | 6.57 | 8.43 | 0.420 | 1.77 | -391.6 | 15.7 | Cloudy |
| 1030 | 250 | 13.41 | 6.62 | 8.31 | 0.420 | 1.82 | -363.9 | 15.2 | Cloudy |
| 1035 | 250 | 13.41 | 6.63 | 8.19 | 0.420 | 1.75 | -360.2 | 15.4 | Cloudy |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): X
Filter Size: 0.45
Sample Time: 1057
Duplicate (Y/N): N
Dup ID/Time: N
MS/MSD (Y/N): N

Comments

BG

Signature

6/7/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** N1-P3_SPR17

Project: 1024-003 Shepleys Spring 2017
Location: Fort Devens Massachusetts

Date: 6/7/17
Sampler: Ian Valentino

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | | X |
| Locked (stickup wells) | | X | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 1in | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 13.31 | TOC |
| Depth to bottom (ft ~~bgs~~) | 21 | TOC |
| Screen Interval (ft-bgs) | 12-17 | |
| Total volume purged (gal) | 7 | |

**Sampling Type**

Purging Method: Peristaltic
Purge start/stop time: 0924 / 1110
Tubing type: LDPE
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: NA

Field Instrument (Model/S/N): YSI 556 (13024113), GEO Pump (Pine ID 11870), Solinist H2O Meter (78177), Lamotte 2020we (3597-3513)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1040 | 250 | 13.41 | 6.49 | 10.85 | 0.421 | 1.59 | -288.2 | 18.2 | cloudy |
| 1045 | 250 | 13.41 | 6.54 | 8.34 | 0.426 | 1.57 | -304.5 | 15.6 | cloudy |
| 1050 | 250 | 13.41 | 6.57 | 8.28 | 0.426 | 1.56 | -304.5 | 15.7 | cloudy |
| 1055 | 250 | 13.41 | 6.59 | 8.30 | 0.425 | 1.52 | -304.8 | 15.9 | cloudy |
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Sample Time: 1057
Duplicate (Y/N): N
Dup ID/Time: N
MS/MSD (Y/N): N

Comments

Signature

6/7/17
Date

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHL-15_SPR17

Project: 1024-003 Shepleys Spring 2017
Location: Fort Devens Massachusetts

Date: 6/7/17
Sampler: Ian Valentino

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | |
| Locked (stickup wells) | | X | |

**Well Information**

| | |
|---|---|
| Diameter | 4.0 |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 16.12 |
| Depth to bottom (ft-~~bgs~~ TOC) | 25.39 |
| Screen Interval (ft-bgs) | 14.5 - 25.5 |
| Total volume purged (gal) | 5591 |

**Sampling Type**

Purging Method: Peristaltic
Purge start/stop time: 1243
Tubing type: LDPE
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: NA

Field Instrument (Model/S/N): YSI 551 (11J02413), GEO Pump (Pine ID 11876, Solinist H2O Meter (18174, Lamotte 2020we (3597-3513

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1318 | 800 | 16.76 | 7.32 | 7.02 | 0.416 | 0.51 | -257. | 14.3 | clear/cloudy |
| 1323 | 200 | 16.35 | 8.42 | 6.88 | 0.416 | 0.53 | -177.4 | 13.3 | clear/cloudy |
| 1328 | 175 | 16.33 | 9.07 | 7.06 | 0.422 | 0.51 | -378.9 | 13.8 | clear/cloudy |
| 1333 | 175 | 16.33 | 8.94 | 6.97 | 0.427 | 0.49 | -224.7 | 14.3 | clear/cloudy |
| 1338 | 175 | 16.33 | 9.06 | 6.89 | 0.428 | 0.50 | -204.9 | 13.9 | clear/cloudy |
| 1343 | 175 | 16.33 | 9.10 | 6.82 | 0.430 | 0.48 | -196.3 | 13.2 | clear/cloudy |
| 1348 | 175 | 16.33 | 9.12 | 6.78 | 0.431 | 0.48 | -192.1 | 13.7 | clear/cloudy |
| 1353 | 175 | 16.33 | 9.12 | 6.76 | 0.432 | 0.47 | -191.9 | 13.8 | clear/cloudy |
| 1358 | 175 | 16.33 | 9.12 | 6.79 | 0.431 | 0.45 | -190.2 | 13.8 | clear/cloudy |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Sample Time: 1400
Duplicate (Y/N): N
Dup ID/Time: N
MS/MSD (Y/N): Y

Comments water has rotten egg smell

Signature

6/7/17
Date

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** 32M-92-01X_SPRD

Project: 1024-003 Shepleys Spring 2017
Location: Fort Devens Massachusetts

Date: 6/8/17
Sampler: Ian Valentine

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 4in |
| Material | PVC |
| Depth to water (ft-~~bgs~~) | 15.95 TOC |
| Depth to bottom (ft ~~bgs~~) | 25.56 TOC |
| Screen Interval (ft-bgs) | 15.7-25.7 |
| Total volume purged (gal) | 2.5991 |

**Sampling Type**

Purging Method: Peristaltic
Purge start/stop time: 0915
Tubing type: LDPE
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: NA

Field Instrument (Model/S/N): YSI 556 (11362413), GEO Pump (Pine ID 11870), Solinist H2O Meter (18172), Lamotte 2020we (3597-2517)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0936 | 250 | 16.35 | 8.96 | 6.77 | 0.338 | 8.60 | 198.6 | 6.74 | clear |
| 0940 | 175 | 16.21 | 9.93 | 6.75 | 0.352 | 8.02 | 181.7 | 8.24 | clear |
| 0945 | 175 | 16.21 | 10.03 | 6.68 | 0.372 | 8.01 | 174.4 | 8.38 | clear |
| 0950 | 175 | 16.21 | 10.14 | 6.60 | 0.382 | 7.31 | 171.5 | 8.66 | clear |
| 0955 | 175 | 16.21 | 9.71 | 6.51 | 0.387 | 7.33 | 172.9 | 8.40 | clear |
| 1000 | 175 | 16.21 | 9.85 | 6.43 | 0.386 | 6.69 | 174.0 | 8.04 | clear |
| 1005 | 175 | 16.21 | 9.78 | 6.44 | 0.389 | 6.75 | 172.0 | 7.41 | clear |
| 1010 | 175 | 16.21 | 9.81 | 6.43 | 0.393 | 6.73 | 170.9 | 7.06 | clear |
| 1015 | 175 | 16.21 | 9.77 | 6.40 | 0.395 | 6.74 | 171.6 | 7.09 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Sample Time: 1017
Duplicate (Y/N): N
Dup ID/Time: NA
MS/MSD (Y/N): N

Comments

Signature

6/8/17
Date

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-12_SPR17

Project: 1024-003 Shepleys Spring 2017 Date: 6/8/17

Location: Fort Devens Massachusetts Sampler: Ian Dalentino

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | |
| Locked (stickup wells) | X | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2in | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 21.12 | TOC |
| Depth to bottom (ft-~~bgs~~) | 28.36 | TOC |
| Screen Interval (ft-bgs) | 15-30 | |
| Total volume purged (gal) | 3.94 | |

**Sampling Type**

Purging Method: peristaltic Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 1106 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI 55 (11102413), GEO Pump (Pine ID 11870, Solinist H2O Meter (18174),

Lamotte 2020we (3597-3513

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1119 | 500 | 21.42 | 7.97 | 6.73 | 0.750 | 1.09 | 88.2 | 174 | Cloudy |
| 1124 | 490 | 21.38 | 8.62 | 6.69 | 0.752 | 0.81 | 92.0 | 7.09 | Clear |
| 1129 | 150 | 21.31 | 8.73 | 6.67 | 0.754 | 0.77 | 95.2 | 3.73 | Clear |
| 1134 | 150 | 21.33 | 8.79 | 6.64 | 0.754 | 0.79 | 99.7 | 2.99 | Clear |
| 1139 | 150 | 21.33 | 8.75 | 6.64 | 0.755 | 0.85 | 102.4 | 3.07 | Clear |
| 1144 | 150 | 21.33 | 8.67 | 6.64 | 0.755 | 0.90 | 104.2 | 3.29 | Clear |
| 1149 | 150 | 21.33 | 8.61 | 6.66 | 0.755 | 0.88 | 105.6 | 2.68 | Clear |
| 1154 | 150 | 21.32 | 8.67 | 6.65 | 0.754 | 0.85 | 106.7 | 2.17 | Clear |
| 1159 | 150 | 21.33 | 8.63 | 6.66 | 0.753 | 0.79 | 107.6 | 2.15 | Clear |
| 1204 | 150 | 21.33 | 8.63 | 6.66 | 0.753 | 0.74 | 108.1 | 2.04 | Clear |
| 1209 | 150 | 21.33 | 8.63 | 6.68 | 0.752 | 0.72 | 101.9 | 2.06 | Clear |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: 0.45 Dup ID/Time: N/A

Sample Time: 1214

**omments**

Signature

6/8/17

Date

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** N7-P1

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/8/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | ✓ | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 1" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 30.32 | TOC |
| Depth to bottom (ft ~~bgs~~) | 70.82 | TOC |
| Screen Interval (ft-~~bgs~~) | 66-68 | 66-68 Bgs |
| Total volume purged (gal) | 2.0 | |

**Sampling Type**

Purging Method geotech
Purge start/stop time 1000
Tubing type poly
Tubing diameter 4 4"
Dedicated pump (Y/N) N
Air source N/A
Field Instrument (Model/S/N) YSI 556 MPS 07[illegible]
LaMotte 2020WE A0275

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1000 | 100 | 30.16 | 13.04 | 6.55 | 263 | 0.63 | -62.3 | 19.3 | Clear |
| 1005 | ↓ | 30.16 | 13.39 | 6.27 | 471 | 0.40 | -54.7 | 12.6 | ↓ |
| 1010 | ↓ | 30.16 | 13.43 | 6.20 | 503 | 0.32 | -52.6 | 11.6 | ↓ |
| 1015 | ↓ | 30.16 | 13.40 | 6.14 | 553 | 0.27 | -51.3 | 9.99 | ↓ |
| 1020 | ↓ | 30.16 | 13.36 | 6.12 | 560 | 0.25 | -49.5 | 9.67 | ↓ |
| 1025 | ↓ | 30.16 | 13.40 | 6.13 | 563 | 0.26 | -49.3 | 9.64 | ↓ |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** N7-P1-SPR17 @ 1030 (BK)

[signature]
**Signature**

6/8/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** N7-P2

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/8/17
Sampler: KKK

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~) | 30.51 TOC |
| Depth to bottom (ft ~~bgs~~) | 37.11 TOC |
| Screen Interval (ft-~~bgs~~) | ~~[illegible]~~ 29-34 BGS |
| Total volume purged (gal) | 2.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1120
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 07K [illegible] 70 122
LaMotte 2020we A02795

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1120 | 100 | 30.39 | 13.31 | 5.90 | 408 | 0.38 | -28.1 | 15.3 | Clear |
| 1125 | | 30.39 | 12.97 | 5.93 | 407 | 0.29 | -27.6 | 13.3 | |
| 1130 | | 30.39 | 12.93 | 5.94 | 407 | 0.28 | -42.1 | 12.9 | |
| 1135 | | 30.39 | 12.90 | 5.94 | 406 | 0.29 | -45.1 | 11.9 | |
| 1140 | | 30.39 | 12.82 | 5.96 | 406 | 0.29 | -46.2 | 11.7 | |
| 1145 | | 30.39 | 12.90 | 5.96 | 405 | 0.30 | -44.7 | 11.6 | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** N7-P2-SPR17 @ 1150 (BK)

Signature

6/8/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** 32M-01-14X0B

Project: SMR
Location: Fort Devens Massachusetts
Date: 6/8/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 21.14 | TOC |
| Depth to bottom (ft ~~bgs~~) | 29.64 | TOC |
| Screen Interval (ft-~~bgs~~) | ~~[illegible]~~ 17.3 - 27.3 | BGS |
| Total volume purged (gal) | 3.0 | |

**Sampling Type**

Purging Method: Bladder pump
Purge start/stop time: 1245
Tubing type: Bladder pump
Tubing diameter: 1/4" X 1/4"
Dedicated pump (Y/N): Y
Air source: N
Field Instrument (Model/S/N): YSI 556 MPS 07 K100 122
LaMotte 2020LE A0175

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1245 | 200 | 24.42 | 12.65 | 5.72 | 373 | 0.62 | 35.7 | 9.87 | Clear |
| 1250 | ↓ | 24.42 | 12.97 | 5.89 | 377 | 0.73 | 23.6 | 9.77 | ↓ |
| 1255 | ↓ | 24.42 | 13.25 | 5.92 | 379 | 0.80 | 18.4 | 9.67 | ↓ |
| 1300 | ↓ | 24.42 | 13.13 | 5.93 | 380 | 0.79 | 16.9 | 9.66 | ↓ |
| 1305 | ↓ | 24.42 | 13.12 | 5.94 | 382 | 0.78 | 15.7 | 9.64 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** 32M-01-14X0B - SPR17 @ 1310 (BK)

[signature]
**Signature**

6/8/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-13-06

Project: 1024-003 Shepleys Spring 2017 Date: 6/9/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | X | | |
| Locked (stickup wells) | | X | X |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 14.43 |
| Depth to bottom (ft ~~bgs~~ TOC) | 45.78 |
| Screen Interval (ft-bgs) | 36-46 |
| Total volume purged (gal) | 5.00 |

**Sampling Type**

Purging Method: Peristaltic Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 905/926 Tubing diameter: 1/4" / 1/2" Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 926 | 426 | 16.45 | 11.91 | 6.77 | 0.631 | 0.56 | -101.5 | 14.19 | Clear |
| 931 | 200 | 16.45 | 12.76 | 6.80 | 0.633 | 0.64 | -88.4 | 12.51 | Clear |
| 936 | 200 | 16.45 | 12.80 | 6.82 | 0.637 | 0.62 | -87.0 | 13.13 | Clear |
| 941 | 200 | 16.45 | 12.97 | 6.83 | 0.637 | 0.75 | -88.2 | 12.62 | Clear |
| 946 | 200 | 16.45 | 12.90 | 6.83 | 0.635 | 0.66 | -94.3 | 12.47 | Clear |
| 951 | 150 | 16.45 | 12.91 | 6.82 | 0.635 | 0.65 | -100.1 | 6.11 | Clear |
| 956 | 150 | 16.45 | 12.92 | 6.83 | 0.636 | 0.64 | -101.4 | 6.04 | Clear |
| 1001 | 150 | 16.45 | 12.93 | 6.84 | 0.638 | 0.64 | -102.5 | 5.98 | Clear |
| 1006 | 150 | 16.45 | 12.93 | 6.84 | 0.638 | 0.64 | -100.1 | 6.03 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHM-13-06_SPR17

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45um Dup ID/Time:

Sample time: 1008

**Comments** Dedicated tubing

Melissa A. Miller 6/9/17 BG

**Signature** Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** 322-01-07X

Project: 1024-003 Shepleys Spring 2017 Date: 6/9/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | | X | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 13.50 |
| Depth to bottom (ft-~~bgs~~ TOC) | 25.01 |
| Screen Interval (ft-bgs) | 12.7-22.7 |
| Total volume purged (gal) | 3.75 |

grave

**Sampling Type**

Purging Method: Peristaltic Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 1050/1105 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (~~µS/cm°~~ mS/cm) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1105 | 400 | 13.37 | 9.17 | 5.92 | 0.196 | 9.28 | 162.6 | 21.92 | Cloudy/Clear - Red |
| 1110 | 200 | 13.23 | 10.23 | 5.93 | 0.188 | 8.55 | 126.4 | 16.80 | Clear |
| 1115 | 200 | 13.19 | 10.32 | 5.88 | 0.188 | 8.58 | 120.2 | 15.23 | Clear |
| 1120 | 200 | 13.19 | 10.33 | 5.87 | 0.187 | 8.56 | 121.6 | 14.00 | Clear |
| 1125 | 200 | 13.18 | 10.34 | 5.85 | 0.188 | 8.60 | 118.1 | 9.70 | Clear |
| 1130 | 200 | 13.18 | 10.36 | 5.83 | 0.188 | 8.57 | 117.1 | 9.62 | Clear |
| 1135 | 200 | 13.18 | 10.36 | 5.84 | 0.189 | 8.55 | 114.6 | 9.32 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

322-01-07 SPR 17

Field Filtered (Y/N): Y Duplicate (Y/N): Y MS/MSD (Y/N): N

Filter Size: .45um Dup ID/Time: SHL-BG-DUP04-SPR17

Sample time: 1137 Sample time: 1142

**Comments** AKA 322-01-07XOB, needs LOCK, has dedicated tubing

*Field Duplicate

Melissa A. Miller 6/9/17

**Signature** Date

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-25

Project: 1024-003 Shepleys Spring 2017 | Date: 6/9/17

Location: Fort Devens Massachusetts | Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | X | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 4" | |
| Material | PVC | |
| Depth to water (ft ~~bgs~~) | 25.05 | TOC |
| Depth to bottom (ft ~~bgs~~) | 35.93 | TOC |
| Screen Interval (ft-bgs) | 23.5-33.5 | |
| Total volume purged (gal) | 3.25 | |

gravel

**Sampling Type**

Purging Method: Peristaltic | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 1345/1350 | Tubing diameter: 1/4" | Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1350 | 350 | 25.20 | 15.65 | 6.27 | 0.869 | 6.68 | 146.2 | 13.82 | Clear |
| 1355 | 200 | 25.20 | 14.13 | 6.13 | 0.919 | 6.13 | 142.9 | 10.27 | Clear |
| 1400 | 175 | 25.20 | 13.98 | 6.09 | 0.918 | 5.11 | 141.6 | 8.65 | Clear |
| 1405 | 175 | 25.20 | 13.99 | 6.08 | 0.918 | 5.07 | 143.6 | 8.62 | Clear |
| 1410 | 175 | 25.20 | 13.98 | 6.07 | 0.917 | 5.06 | 142.9 | 8.59 | Clear |
| 1415 | 175 | 25.20 | 13.99 | 6.05 | 0.917 | 5.03 | 142.9 | 8.55 | Clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHL-25_SPR17

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): N

Filter Size: .45um | Dup ID/Time:

Sample Time: 1417

Comments: Replaced tubing, dedicated tubing

Melissa A Miller

Signature

6/9/17

Date

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** MW-7

Project: 1024-003 Shepleys Spring 2017 | Date: 6/12/17

Location: Fort Devens Massachusetts | Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | X | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 6.12 |
| Depth to bottom (ft-~~bgs~~ TOC) | 11.64 |
| Screen Interval (ft-bgs) | 6.98-8.98 |
| Total volume purged (gal) | 3.25 |

**Sampling Type**

Purging Method: Peristaltic | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 1345 / 1410 | Tubing diameter: 1/4" | Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1410 | 400 | 11.50 | 15.93 | 4.83 | 0.051 | 8.68 | 336.3 | 4,614 | Silty/white |
| * Purged Dry @ | 1415 | – Recharge for 30 mins | | | | | | | |
| 1445 | 150 | 8.15 | 16.35 | 4.97 | 0.057 | 8.25 | 335.3 | 1765 | Silty white |
| 1450 | 150 | 10.27 | 15.74 | 4.67 | 0.051 | 8.31 | 357.0 | 16.73 | silty white |
| 1455 | 150 | 11.55 | 14.50 | 4.41 | 0.055 | 8.95 | 382.0 | 1529 | Silty white |
| 1500 | purged Dry Allowed to recharge for 15 mins | | | | | | | | |
| 1520 | 125 | 8.13 | 14.04 | 4.64 | 0.056 | 9.57 | 379.0 | 34.68 | cloudy clear |
| 1525 | 125 | 8.20 | 14.31 | 4.55 | 0.056 | 9.49 | 385.1 | 26.27 | cloudy clear |
| 1530 | 125 | 8.22 | 14.27 | 4.50 | 0.055 | 9.51 | 387.1 | 22.51 | cloudy / clear |
| 1535 | 125 | 8.35 | 14.29 | 4.47 | 0.056 | 9.49 | 389.1 | 22.47 | cloudy / clear |
| 1540 | 125 | 8.37 | 14.27 | 4.46 | 0.056 | 9.51 | 391.2 | 22.39 | cloudy/clear |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

MW-7-SPR17

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): N

Filter Size: .45 um | Dup ID/Time:

Sample time 1542

**Comments** No Lock, CAP/Gripper Plug. Dedicated tubing, Very Slow Recharge

Melissa Miller

**Signature**

6/12/17

Date

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** MW-4-1

Project: 1024-003 Shepleys Spring 2017 | Date: 6/12/17

Location: Fort Devens Massachusetts | Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | | | X |
| Bolts present | | X | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TPVC) | 3.32 TOC |
| Depth to bottom (ft-~~bgs~~ TPVC) | 7.27 TOC |
| Screen Interval (ft-bgs) | 3.72-5.72 |
| Total volume purged (gal) | 6.00 |

**Sampling Type**

Purging Method: Peristaltic | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 1140/1200 | Tubing diameter: 1/4" | Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1200 | 450 | 5.90 | 10.89 | 4.69 | 0.060 | 5.80 | 207.5 | 14.46 | Clear |
| 1205 | 200 | 5.85 | 12.02 | 4.89 | 0.060 | 5.48 | 210.0 | 14.03 | clear |
| 1210 | 200 | 5.81 | 12.13 | 4.90 | 0.060 | 5.46 | 215.7 | 13.72 | Clear |
| 1215 | 200 | 5.85 | 12.23 | 4.93 | 0.060 | 5.42 | 231.5 | 12.16 | Clear |
| 1220 | 200 | 5.84 | 12.41 | 4.86 | 0.060 | 5.41 | 245.1 | 11.21 | clear |
| 1225 | 200 | 5.84 | 12.48 | 4.83 | 0.060 | 5.41 | 254.9 | 10.25 | Clear |
| 1230 | 150 | 5.84 | 12.46 | 4.81 | 0.060 | 5.39 | 259.1 | 9.99 | clear |
| 1235 | 150 | 5.84 | 12.48 | 4.79 | 0.060 | 5.35 | 260.7 | 9.91 | clear |
| 1240 | 150 | 5.84 | 12.48 | 4.78 | 0.060 | 5.35 | 265.6 | 9.87 | Clear |
| 1245 | 150 | 5.84 | 12.49 | 4.76 | 0.060 | 5.35 | 267.5 | 9.84 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

MW-4-1-SPR17

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): N

Filter Size: .45um | Dup ID/Time:

sample time: 1247

**Comments** needs Lock, needs cap/Gripper plug

Melissa A. Miller

**Signature**

6/12/17

Date

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMP-2016-7A

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/13/17
Sampler: MA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 1.5" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 14.27 | TOC |
| Depth to bottom (ft-~~bgs~~) | 31.63 | TOC |
| Screen Interval (ft-~~bgs~~) | ~~[illegible]~~ | bgs 22-32.0 |
| Total volume purged (gal) | 4.0 | |

**Sampling Type**

Purging Method: geotech
Purge start/stop time:
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556MPS 07610012 LaMotte 2020WE A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 915 | 200 | 14.53 | 13.73 | 3.67 | 93 | 0.39 | 164.9 | 10.76 | clear |
| 920 | ↓ | 14.53 | 13.69 | 4.47 | 79 | 0.43 | 112.6 | 9.61 | ↓ |
| 925 | ↓ | 14.53 | 13.57 | 4.51 | 66 | 0.51 | 96.2 | 8.93 | ↓ |
| 930 | ↓ | 14.53 | 13.39 | 4.49 | 63 | 0.47 | 99.6 | 8.59 | ↓ |
| 935 | ↓ | 14.53 | 13.32 | 4.47 | 61 | 0.44 | 102.1 | 8.61 | ↓ |
| 940 | ↓ | 14.53 | 13.37 | 4.49 | 62 | 0.43 | 103.6 | 8.59 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): ~~N~~ Y
Filter Size: .45
Duplicate (Y/N): Y
Dup ID/Time: SHL-BG-DUP-2 SPR17 @950
MS/MSD (Y/N): N

**Comments** SMP-2016-7A-SPR17 @ 945 BG

Signature

6/13/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMP-2016-7B

Project: SHL
Location: Fort Devens Massachusetts

Date: 6/13/17
Sampler: KGA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 1.5" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 22.46 | TOC |
| Depth to bottom (ft ~~bgs~~) | 80.00 | TOC |
| Screen Interval (ft-~~bgs~~) | ~~[illegible]~~ | 70-80 bgs |
| Total volume purged (gal) | 3.0 | |

**Sampling Type**

Purging Method: peristaltic
Purge start/stop time: 1040
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 07610922
LaMotte 2020wi A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1040 | 200 | 25.21 | 16.91 | 6.77 | 292 | 1.71 | 22.9 | 11.5 | clear |
| 1045 | 75 | 25.97 | 18.93 | 6.71 | 300 | 1.47 | 27.6 | 7.41 | ↓ |
| 1050 | ↓ | 26.16 | 19.11 | 6.67 | 302 | 1.39 | 30.9 | 7.39 | ↓ |
| 1055 | ↓ | 26.53 | 19.21 | 6.66 | 303 | 1.37 | 31.6 | 7.37 | ↓ |
| 1100 | ↓ | 26.93 | 19.24 | 6.67 | 301 | 1.34 | 32.3 | 7.32 | ↓ |
| | | | | | | | | | |
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| Acceptance Criteria: | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% |
|---|---|---|---|---|---|---|---|

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SMP-2016-7B-SPR17 @ 1105 (BK)

**Signature**

6/13/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-17

Project: SHL
Location: Fort Devens Massachusetts

Date: 6/13/17
Sampler: MK

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | ✓ |
| Locked (stickup wells) | ✓ | ✓ | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 4" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 7.04 | TOC |
| Depth to bottom (ft ~~bgs~~) | 17.98 | TOC |
| Screen Interval (ft-~~bgs~~) | 6-16 | BGS |
| Total volume purged (gal) | 3.0 | |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1245
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 07610100122
LaMotte 2020WE A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1245 | 200 | 6.65 | 15.38 | 6.72 | 188 | 0.79 | 97.7 | 8.73 | clear |
| 1250 | ↓ | 6.65 | 15.50 | 6.63 | 186 | 0.45 | 97.4 | 8.60 | ↓ |
| 1255 | ↓ | 6.65 | 15.29 | 6.54 | 182 | 0.35 | 97.6 | 7.73 | ↓ |
| 1300 | ↓ | 6.65 | 15.31 | 6.53 | 180 | 0.36 | 97.4 | 7.69 | ↓ |
| 1305 | ↓ | 6.65 | 15.34 | 6.53 | 179 | 0.37 | 97.2 | 7.63 | ↓ |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SHL-17-SPR17 @ 1310 (BK)

Signature

6/13/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** MW-9

Project: 1024-003 Shepleys Spring 2017 | Date: 6/13/17

Location: Fort Devens Massachusetts | Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | X | X |
| Locked (stickup wells) | X | | |

needs Lock

**Well Information**

| | | |
|---|---|---|
| Diameter | 1" | |
| Material | PVC | |
| Depth to water (ft-bgs) | 9.18 | TOC |
| Depth to bottom (ft-bgs) | 11.78 | TOC |
| Screen Interval (ft-bgs) | 7.65-9.65 | |
| Total volume purged (gal) | .25 | |

**Sampling Type**

Purging Method: Peristaltic | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 940/950 | Tubing diameter: 1/4" | Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 950 | * Purged | Dry. Allowed to recharge for 30 mins | | | | | | | |
| 1020 | 125 | 10.12 | 18.44 | 5.79 | 0.099 | 3.12 | 59.5 | 25.34 | Clear |
| 1025 | X Purge | Dry Allowed to Recharge for 30 mins | | | | | | | |
| 1055 | | 11.50. | Insufficient | Recharge. | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

MW-9_SPR17 X

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): N

Filter Size: .45 um | Dup ID/Time:

Sample Time: X

**Comments** ~~[illegible]~~ Unable to Purge/Sample Due to Poor recharge Rate.

Signature

6/13/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** Q5-1

Project: 1024-003 Shepleys Spring 2017 Date: 6/13/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | X |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | X | X |
| Locked (stickup wells) | | X | |

not locknable

CAP

**Well Information**

| | | |
|---|---|---|
| Diameter | 1.5" | |
| Material | PVC | |
| Depth to water (ft-bgs) | 5.12 | TOC |
| Depth to bottom (ft bgs) | 52.98 | TOC |
| Screen Interval (ft-bgs) | 47-52 | BGS |
| Total volume purged (gal) | 4.75 | |

**Sampling Type**

Purging Method: Peristaltic Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 1105/1120 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1120 | 450 | 7.23 | 10.65 | 5.20 | 0.104 | 8.36 | 214.9 | 23.76 | clear |
| 1125 | 200 | 6.72 | 11.66 | 5.55 | 0.104 | 8.45 | 209.1 | 17.12 | clear |
| 1130 | 200 | 6.55 | 11.88 | 5.76 | 0.104 | 8.40 | 203.0 | 9.92 | clear |
| 1135 | 200 | 6.52 | 11.89 | 5.78 | 0.105 | 8.38 | 203.6 | 9.65 | clear |
| 1140 | 200 | 6.49 | 11.90 | 5.78 | 0.105 | 8.37 | 203.7 | 9.61 | clear |
| 1145 | 200 | 6.47 | 11.92 | 5.76 | 0.105 | 8.35 | 203.8 | 9.59 | clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Q5-1_SPR17

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45 um Dup ID/Time:

Sample Time: 1147

Comments Has dedicated tubing, No Internal gripper cap for Riser

Melissa A. Miller 6/13/17

Signature Date

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** 3-2

Project: 1024-003 Shepleys Spring 2017 Date: 6/13/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | | X | X - ground |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | X |
| Locked (stickup wells) | | X | |

Not lockable

**Well Information**

| | | |
|---|---|---|
| Diameter | 1.5" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 25.39 | TOC |
| Depth to bottom (ft ~~bgs~~) | 58.02 | TOC |
| Screen Interval (ft-bgs) | 54-59.00 | |
| Total volume purged (gal) | 3.75 | |

**Sampling Type**

Purging Method: Peristaltic Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 1315/1330 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1330 | 350 | 25.65 | 14.41 | 7.20 | 0.168 | 7.60 | 212.0 | 15.03 | Clear |
| 1335 | 200 | 25.54 | 14.62 | 7.00 | 0.167 | 6.98 | 227.6 | 11.23 | Clear |
| 1340 | 200 | 25.53 | 14.74 | 6.98 | 0.167 | 6.75 | 234.9 | 13.73 | Clear |
| 1345 | 200 | 25.53 | 14.84 | 6.90 | 0.168 | 6.55 | 245.2 | 12.27 | Clear |
| 1350 | 200 | 25.53 | 14.92 | 6.85 | 0.167 | 6.56 | 249.9 | 10.25 | Clear |
| * 1355 | 150 | 25.49 | 14.95 | 6.66 | 0.162 | 6.38 | 267.9 | 10.13 | Clear |
| 1400 | 150 | 25.47 | 14.97 | 6.61 | 0.161 | 6.35 | 270.2 | 9.97 | Clear |
| 1405 | 150 | 25.47 | 14.98 | 6.60 | 0.160 | 6.36 | 275.3 | 9.92 | Clear |
| 1410 | 150 | 25.46 | 14.97 | 6.59 | 0.159 | 6.37 | 277.1 | 9.89 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

3-2_SPR 17

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45um Dup ID/Time:

Sample time 1412

omments Had to replace tubing, * change battery on pump

Melissa Miller

Signature

6/13/17

Date

BF

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMP-2016-6B

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/15/17
Sampler: VKA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | ✓ |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 1.5" |
| Material | PVC |
| Depth to water (ft-bgs) | ~~26.35~~ 19.80 TOC |
| Depth to bottom (ft bgs) | ~~85.77~~ 111.94 TOC |
| Screen Interval (ft-~~bgs~~) | 102-112 bgs |
| Total volume purged (gal) | 1.5 |

**Sampling Type**

Purging Method: Bladder pump
Purge start/stop time: 755
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: Nitrogen
Field Instrument (Model/S/N): YSI 556MPS 07 610 0122
LaMotte 2020WG A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 755 | 50 | 20.48 | 13.64 | 7.83 | 248 | 5.21 | 28.8 | 13.1 | Clear |
| 800 | ↓ | 20.58 | 13.65 | 6.74 | 246 | 2.21 | 80.5 | 8.71 | ↓ |
| 805 | | 20.68 | 13.62 | 6.81 | 246 | 1.39 | 74.2 | 7.79 | |
| 810 | | 20.72 | 13.74 | 7.01 | 245 | 1.29 | 52.1 | 7.01 | |
| 815 | | 20.74 | 13.72 | 7.11 | 246 | 1.14 | 49.6 | 6.93 | |
| 820 | | 20.75 | 13.71 | 7.13 | 245 | 1.10 | 48.7 | 6.89 | |
| 825 | ↓ | 20.77 | 13.73 | 7.14 | 246 | 1.09 | 48.6 | 6.91 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SMP-2016-6B-SPR17 @ 830 BB

Signature

6/15/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMP-2016-6C

Project: SMP
Location: Fort Devens Massachusetts
Date: 6/14/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 1.5" | |
| Material | PVC | |
| Depth to water (ft-bgs) | 19.75 | TOC |
| Depth to bottom (ft bgs) | 132.86 | TOC |
| Screen Interval (ft-bgs) | 123-133 | BGS |
| Total volume purged (gal) | 1.5 | |

**Sampling Type**

Purging Method: Bladder pump
Purge start/stop time: 1135
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: Nitrogen
Field Instrument (Model/S/N): YSI 556MPS 07610002
LaMotte 2020WE A02775

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1135 | 50 | 19.83 | 16.94 | 6.84 | 261 | 1.96 | 92.7 | 13.5 | Clear |
| 1140 | ↓ | 19.83 | 17.37 | 7.13 | 285 | 1.83 | 73.6 | 8.99 | ↓ |
| 1145 | ↓ | 19.83 | 17.70 | 7.43 | 286 | 1.71 | 47.6 | 8.90 | ↓ |
| 1150 | ↓ | 19.83 | 18.56 | 7.41 | 283 | 1.21 | 42.7 | 8.93 | ↓ |
| 1155 | ↓ | 19.83 | 18.46 | 7.50 | 270 | 1.12 | 40.5 | 8.87 | ↓ |
| 1200 | ↓ | 19.83 | 18.47 | 7.52 | 273 | 1.11 | 39.6 | 8.73 | ↓ |
| 1205 | ↓ | 19.83 | 18.59 | 7.51 | 276 | 1.07 | 38.7 | 8.70 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SMP-2016-6C-SPR17 @ 1210 (BG)

[illegible]
**Signature**

6/14/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMP-2016 – 6A

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/15/17
Sampler: WGA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | ✓ |
| Bolts present | ✓ | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 1.5" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 26.35 | TOC |
| Depth to bottom (ft ~~bgs~~) | 55.72 | TOC |
| Screen Interval (ft-~~bgs~~) | 81-86 | BGS |
| Total volume purged (gal) | 1.5 | |

**Sampling Type**

Purging Method: Bladder pump
Purge start/stop time: 1000
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N, tragen
Field Instrument (Model/S/N): YSI 556 MPS 07E100122
LaMotte 2020WE ~~[illegible]~~ A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1000 | 50 | 27.07 | 13.63 | 7.55 | 208 | 7.36 | 110.6 | 11.6 | Clear |
| 1005 | ↓ | 27.47 | 13.47 | 7.31 | 205 | 5.97 | 114.3 | 11.3 | ↓ |
| 1010 | ↓ | 27.91 | 13.35 | 7.26 | 204 | 5.21 | 120.1 | 10.14 | ↓ |
| 1015 | ↓ | 28.43 | 13.40 | 7.37 | 205 | 4.87 | 109.6 | 9.89 | ↓ |
| 1020 | ↓ | 28.84 | 13.22 | 7.46 | 205 | 4.61 | 103.4 | 9.67 | ↓ |
| 1025 | ↓ | 29.30 | 13.30 | 7.47 | 204 | 4.60 | 102.7 | 9.64 | ↓ |
| 1030 | ↓ | 29.89 | 13.47 | 7.49 | 204 | 4.57 | 102.3 | 9.63 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SMP-2016-6A-SPR17 @ 1035 (BG)

Signature

6/15/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** Q4-1

Project: 1024-003 Shepleys Spring 2017
Location: Fort Devens Massachusetts

Date: 6/14/17
Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | X |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | X | |
| Bolts present | | X | X |
| Locked (stickup wells) | | X | X |

Not Locatable cap

**Well Information**

| | |
|---|---|
| Diameter | 1.5" |
| Material | PVC |
| Depth to water (ft-~~bgs~~) | 8.75 TOC |
| Depth to bottom (ft-~~bgs~~) | 41.89 TOC |
| Screen Interval (ft-bgs) | 30-40 |
| Total volume purged (gal) | 3.0 |

**Sampling Type**

Purging Method: ~~Tbl~~ Peristaltic
Purge start/stop time: 1015/1040
Tubing type: LDPE
Tubing diameter: 1/4" / 1/8"
Dedicated pump (Y/N): N
Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1040 | 450 | 10.48 | 10.60 | 6.12 | 0083 | 9.51 | 855.3 | 18.15 | Clear |
| 1045 | 200 | 10.17 | 11.23 | 6.01 | 0.081 | 9.38 | 250.8 | 13.05 | Clear |
| 1050 | 200 | 10.16 | 11.35 | 6.04 | 0.081 | 9.32 | 245.2 | 12.13 | clear |
| 1055 | 200 | 10.16 | 11.37 | 6.01 | 0.081 | 9.15 | 242.8 | 11.23 | clear |
| 1100 | 200 | 10.16 | 11.39 | 5.96 | 0.081 | 9.05 | 243.7 | 9.90 | Clear |
| 1105 | 200 | 10.16 | 11.41 | 5.87 | 0.081 | 9.01 | 245.7 | 9.87 | Clear |
| 1110 | 200 | 10.15 | 11.43 | 5.82 | 0.080 | 9.01 | 248.4 | 9.83 | clear |
| 1115 | 200 | 10.15 | 11.40 | 5.79 | 0.079 | 9.01 | 249.4 | 9.80 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Q4-1_SPR-17
Field Filtered (Y/N): Y
Filter Size: .45uM
Duplicate (Y/N): N
Dup ID/Time:
MS/MSD (Y/N): N
Sample time: 1117

Comments: Replaced tubing.

Melissa A. Miller
Signature

6/14/17
Date

BS

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** MW-22

Project: 1024-003 Shepleys Spring 2017 Date: 6/14/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | X | X |
| Locked (stickup wells) | X | | |

no cover

**Well Information**

| | | |
|---|---|---|
| Diameter | 1" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 6.25 | TOC |
| Depth to bottom (ft ~~bgs~~) | 8.43 | TOC |
| Screen Interval (ft-bgs) | 4.7-6.7 | |
| Total volume purged (gal) | 2.75 | |

**Sampling Type**

Purging Method: Peristaltic Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 1150/1205 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1205 | 350 | 7.80 | 10.96 | 4.24 | 0.056 | 2.42 | 299.5 | 22.96 | Clear |
| 1210 | 200 | 7.54 | 11.07 | 4.30 | 0.049 | 2.37 | 298.5 | 18.20 | Clear |
| 1215 | 200 | 7.23 | 11.27 | 4.50 | 0.049 | 2.25 | 293.0 | 16.17 | Clear |
| 1220 | 150 | 7.17 | 11.33 | 4.53 | 0.048 | 2.13 | 297.2 | 10.11 | Clear |
| 1225 | 150 | 7.15 | 11.38 | 4.56 | 0.048 | 2.10 | 299.9 | 9.45 | Clear |
| 1230 | 150 | 7.13 | 11.40 | 4.62 | 0.048 | 2.09 | 300.3 | 9.43 | Clear |
| 1235 | 150 | 7.13 | 11.42 | 4.63 | 0.048 | 2.09 | 302.7 | 9.39 | Clear |
| 1240 | 150 | 7.12 | 11.44 | 4.63 | 0.048 | 2.08 | 306.1 | 9.41 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

MW-22_SPR17

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45 um Dup ID/Time:

Sample Time: 1242

Comments: ☆ Riser is Heaved above casing, unable to lock needs new gripper cap, Replaced tubing

Melissa A. Miller

Signature

6/14/17

Date

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** MW-14

Project: 1024-003 Shepleys Spring 2017 | Date: 6/14/17

Location: Fort Devens Massachusetts | Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | X | X |
| Locked (stickup wells) | X | | |

~NO LOCK

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-bgs) TOC | 6.85 toc |
| Depth to bottom (ft bgs) TOC | 11.72 toc |
| Screen Interval (ft-bgs) | 5.14-7.14 |
| Total volume purged (gal) | 3.25 |

**Sampling Type**

Purging Method: Peristaltic | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 1350/1410 | Tubing diameter: 1/4" | Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1410 | 400 | 8.92 | 11.40 | 4.56 | 0.056 | 5.66 | 354.3 | 16.40 | Clear |
| 1415 | 300 | 8.53 | 11.49 | 4.53 | 0.055 | 5.57 | 353.1 | 12.13 | Clear |
| 1420 | 200 | 7.79 | 11.97 | 4.62 | 0.055 | 5.43 | 351.7 | 10.21 | Clear |
| 1425 | 200 | 7.51 | 12.27 | 4.93 | 0.055 | 5.22 | 349.2 | 8.73 | Clear |
| 1430 | 200 | 7.42 | 12.38 | 4.79 | 0.056 | 5.17 | 348.0 | 7.87 | Clear |
| 1435 | 200 | 7.40 | 12.37 | 4.75 | 0.055 | 5.20 | 348.8 | 7.81 | Clear |
| 1440 | 200 | 7.40 | 12.36 | 4.75 | 0.055 | 5.22 | 345.0 | 7.79 | Clear |
| 1445 | 200 | 7.40 | 12.36 | 4.75 | 0.055 | 5.24 | 345.3 | 7.76 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

MW-14-SPR17

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): N

Filter Size: .45 µM | Dup ID/Time:

Sample Time: 1447

omments Replaced tubing. needs Lock / Gripper Plug

Signature | Date 6/14/17

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** N5-P1

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/15/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 1" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 22.67 | TOC |
| Depth to bottom (ft ~~bgs~~) | 100.53 | TOC |
| Screen Interval (ft-~~bgs~~) | 95.5-97.5 | BGS |
| Total volume purged (gal) | 3.0 | |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1255
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 07161 00122
LaMotte 2020wp A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1255 | 200 | 22.86 | 13.82 | 7.06 | 270 | 0.52 | -64.3 | 7.93 | Clear |
| 1300 | ↓ | 22.86 | 13.87 | 7.08 | 270 | 0.49 | -67.9 | 7.99 | ↓ |
| 1305 | ↓ | 22.86 | 13.83 | 7.09 | 270 | 0.48 | -71.3 | 8.01 | ↓ |
| 1310 | ↓ | 22.86 | 13.90 | 7.11 | 268 | 0.49 | -78.7 | 7.07 | ↓ |
| 1315 | ↓ | 22.86 | 13.94 | 7.13 | 270 | 0.49 | -79.3 | 7.01 | ↓ |
| 1320 | ↓ | 22.86 | 13.97 | 7.12 | 269 | 0.48 | -82.1 | 6.97 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 1.45
Duplicate (Y/N): Y
Dup ID/Time: SHL-BG-DUP-1-SPR17 @ 1330
MS/MSD (Y/N): N

**Comments** N5-P1-SPR17 @ 1325

[illegible]
**Signature**

6/15/17
Date

RG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-93-24A

Project: 1024-003 Shepleys Spring 2017 Date: 6/15/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft ~~bgs~~) | 15.38 TOC |
| Depth to bottom (ft ~~bgs~~) | 25.56 TOC |
| Screen Interval (ft-bgs) | 13.2-23.2 |
| Total volume purged (gal) | 3.75 |

-CAP

**Sampling Type**

Purging Method: Peristaltic Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 855/910 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 910 | 450 | 15.39 | 11.23 | 6.63 | 0.548 | 9.72 | 101.7 | 18.82 | Clear |
| 915 | 200 | 15.38 | 11.80 | 6.43 | 0.554 | 9.22 | 81.0 | 13.66 | Clear |
| 920 | 150 | 15.38 | 12.35 | 6.32 | 0.556 | 9.73 | 75.0 | 12.98 | Clear |
| 925 | 150 | 15.38 | 12.37 | 6.26 | 0.558 | 9.66 | 76.3 | 12.71 | Clear |
| 930 | 150 | 15.38 | 12.39 | 6.18 | 0.552 | 9.64 | 78.2 | 11.25 | Clear |
| 935 | 150 | 15.38 | 12.41 | 6.08 | 0.539 | 9.66 | 84.2 | 10.37 | Clear |
| 940 | 150 | 15.38 | 12.43 | 5.81 | 0.539 | 9.70 | 94.3 | 9.97 | Clear |
| 945 | 150 | 15.38 | 12.43 | 5.79 | 0.539 | 9.72 | 99.7 | 9.90 | Clear |
| 950 | 150 | 15.38 | 12.44 | 5.74 | 0.538 | 9.73 | 100.3 | 9.87 | Clear |
| 955 | 150 | 15.38 | 12.46 | 5.72 | 0.538 | 9.74 | 100.7 | 9.81 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHM-93-24A_SRR17

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: 45µm Dup ID/Time:

Sample Time: 957

omments Has dedicated tubing

Signature

6/15/17

Date

BG

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHL-24

Project: 1024-003 Shepleys Spring 2017 Date: 6/15/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | -CAP |
| Bolts present | | X | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 4" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~ PVC) | 15.00 | TOC |
| Depth to bottom (ft ~~bgs~~ PVC) | 119.28 | TOC |
| Screen Interval (ft-~~bgs~~) | 110-120 | BGS |
| Total volume purged (gal) | 3.75 | |

**Sampling Type**

Purging Method: Peristaltic Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 1100/1120 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (~~µS~~ mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1120 | 450 | 14.98 | 16.78 | 6.92 | 0.296 | 8.91 | 120.3 | 18.72 | Clear |
| 1125 | 200 | 14.99 | 17.03 | 7.20 | 0.298 | 8.85 | 117.2 | 13.27 | Clear |
| 1130 | 200 | 14.99 | 17.58 | 7.29 | 0.299 | 8.78 | 116.3 | 11.21 | Clear |
| 1135 | 200 | 14.99 | 17.60 | 7.42 | 0.299 | 8.41 | 114.5 | 9.82 | Clear |
| 1140 | 200 | 14.99 | 17.61 | 7.44 | 0.300 | 8.32 | 114.1 | 9.53 | Clear |
| 1145 | 200 | 14.99 | 17.63 | 7.43 | 0.299 | 8.28 | 114.0 | 9.41 | Clear |
| 1150 | 200 | 14.99 | 17.65 | 7.44 | 0.299 | 8.20 | 113.9 | 9.36 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

SHL-24_SPR17

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45 µM Dup ID/Time:

Sample Time: 1152

omments Has a weighted Bailer to guide tubing. Rope needs to Be longer.

Melissa A. Miller 6/15/17

Signature Date

BS

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** MW-1

Project: 1024-003 Shepleys Spring 2017 | Date: 6/15/17

Location: Fort Devens Massachusetts | Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | X | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 1" | |
| Material | PVC | |
| Depth to water (ft-bgs) | 8.78 | TOC |
| Depth to bottom (ft bgs) | 11.43 | TOC |
| Screen Interval (ft-bgs) | 6.58-8.58 | BGS |
| Total volume purged (gal) | 5.0 | |

**Sampling Type**

Purging Method: Peristaltic | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 1310-1320 | Tubing diameter: 1/4" | Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1320 | 400 | 9.75 | 11.34 | 5.35 | 0.077 | 6.74 | 193.1 | 27.13 | clear |
| 1325 | 200 | 9.13 | 12.47 | 5.63 | 0.072 | 6.61 | 164.1 | 16.27 | clear |
| 1330 | 200 | 9.13 | 13.16 | 5.75 | 0.071 | 6.57 | 124.1 | 13.17 | clear |
| 1335 | 150 | 9.12 | 13.25 | 5.75 | 0.071 | 6.45 | 116.1 | 11.62 | clear |
| 1340 | 150 | 9.10 | 13.31 | 5.69 | 0.072 | 6.44 | 112.3 | 10.11 | clear |
| 1345 | 150 | 9.10 | 13.37 | 5.64 | 0.072 | 6.42 | 110.5 | 9.87 | clear |
| 1350 | 150 | 9.10 | 13.35 | 5.64 | 0.071 | 6.39 | 109.2 | 9.79 | clear |
| 1355 | 150 | 9.10 | 13.30 | 5.63 | 0.071 | 6.38 | 109.9 | 9.77 | clear |
| 1400 | 150 | 9.10 | 13.31 | 5.62 | 0.071 | 6.36 | 110.2 | 9.73 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

MW-1_SPR17

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): N

Filter Size: .45um | Dup ID/Time:

Sample Time: 1402

Comments Replaced Lock & Tubing, needs new gripper cap

Melissa A. Miller — Signature | BGS | 6/15/17 — Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHM-93-22B_SPR17

Project: 1024-003 Shepley's Spr17 Date: 5/23/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

Grout

cap

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft-bgs) | 6.72 |
| Depth to bottom (ft bgs) | 92.68 |
| Screen Interval (ft-bgs) | 82.3-92.3 |
| Total volume purged (gal) | 5.5 |

**Sampling Type** Bladder Pump

Purging Method Low-Flow Tubing type Double Bonded Dedicated pump ~~(Y/N)~~ N

Purge start/stop time 1250 / 1320 Tubing diameter 1/4" Air source Nitrogen

Field Instrument (Model/S/N) YSI 650 MDS (00L-1207A)

QED MP10 Controller (MP10-2482) Bladder Pump Sample Pro (27107 • Sol. inst H2O meter (212202) Lamotte 2020WE (3450-231

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1325 | 400 | 6.70 | 8.71 | 6.32 | 0.620 | 0.46 | 6.4 | 45.91 | clear |
| 1330 | 275 | 6.70 | 8.68 | 6.29 | 0.625 | 0.46 | 4.0 | 42.90 | Clear |
| 1335 | 175 | 6.71 | 8.83 | 6.28 | 0.625 | 0.49 | 3.0 | 41.84 | Clear |
| 1340 | 175 | 6.72 | 8.79 | 6.31 | 0.627 | 0.52 | 1.6 | 38.47 | clear |
| 1345 | 175 | 6.72 | 8.69 | 6.30 | 0.627 | 0.52 | 0.9 | 37.59 | Clear |
| 1350 | 175 | 6.72 | 8.67 | 6.32 | 0.627 | 0.51 | 1.0 | 37.20 | Clear |
| 1355 | 175 | 6.72 | 8.67 | 6.30 | 0.626 | 0.47 | 1.1 | 34.29 | Clear |
| 1400 | 100 | 6.72 | 8.75 | 6.31 | 0.626 | 0.48 | 0.6 | 34.81 | clear |
| 1405 | 100 | 6.72 | 8.74 | 6.31 | 0.626 | 0.48 | 1.0 | 34.71 | clear |
| 1410 | 100 | 6.72 | 8.73 | 6.30 | 0.626 | 0.48 | 1.0 | 34.69 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

SHM-93-22B_Spr17 @ 1412

**Sampling Details**

Field Filtered (Y/N): Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45 µm Dup ID/Time: —

**Comments**

[signature]

Signature

5/23/17

Date

LJM

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-1A

Project: SHL
Location: Fort Devens Massachusetts
Date: 5/23/17
Sampler: VGA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 14.25 |
| Depth to bottom (ft ~~bgs~~ TOC) | 26.17 |
| Screen Interval (ft-~~bgs~~) | 13.9-23.0 bGS |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1010
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556MPS 076100122
LaMotte 2020WE A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1010 | 200 | 14.49 | 10.29 | 4.03 | 78 | 9.01 | 338.1 | 14.1 | Clear |
| 1015 | ↓ | ↓ | 10.18 | 4.79 | 56 | 8.67 | 276.4 | 9.90 | ↓ |
| 1020 | ↓ | ↓ | 10.15 | 4.81 | 49 | 8.19 | 185.8 | 9.83 | ↓ |
| 1025 | ↓ | ↓ | 10.14 | 4.80 | 47 | 7.76 | 154.3 | 9.47 | ↓ |
| 1030 | ↓ | ↓ | 10.19 | 4.79 | 46 | 7.59 | 149.3 | 9.43 | ↓ |
| 1035 | ↓ | ↓ | 10.23 | 4.77 | 45 | 7.53 | 143.7 | 9.39 | ↓ |
| 1040 | ↓ | ↓ | 10.30 | 4.79 | 43 | 7.48 | 141.7 | 9.36 | ↓ |
| 1045 | ↓ | ↓ | 10.32 | 4.77 | 42 | 7.46 | 140.6 | 9.35 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): Y (LTM well)

**Comments** SHP-2016-1A-8PR17 @ 1050 ☆ MS/MSD ☆

[signature]
**Signature**

5/23/17
Date

LTM

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-1B

Project: SML
Location: Fort Devens Massachusetts

Date: 5/23/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 16.47 |
| Depth to bottom (ft ~~bgs~~ TOC) | 25.62 |
| Screen Interval (ft-~~bgs~~) | 75-85.0 BGS |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method geotech
Purge start/stop time 1145
Tubing type poly
Tubing diameter 1/4"
Dedicated pump (Y/N) tubing
Air source N/A
Field Instrument (Model/S/N) [illegible] 076-10092-2
LaMotte 2020WF A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1145 | 200 | 16.27 | 10.92 | 6.63 | 139 | 0.33 | -83.0 | 19.6 | Clear |
| 1150 | ↓ | ↓ | 10.97 | 6.87 | 140 | 0.34 | -91.6 | 15.9 | ↓ |
| 1155 | ↓ | ↓ | 10.97 | 6.89 | 142 | 0.33 | -95.3 | 13.4 | ↓ |
| 1200 | ↓ | ↓ | 10.69 | 6.70 | 143 | 0.24 | -96.4 | 12.69 | ↓ |
| 1205 | ↓ | ↓ | 10.72 | 6.64 | 144 | 0.21 | -96.4 | 12.46 | ↓ |
| 1210 | ↓ | ↓ | 10.80 | 6.65 | 145 | 0.20 | -96.3 | 12.43 | ↓ |
| 1215 | ↓ | ↓ | 10.73 | 6.66 | 147 | 0.21 | -96.4 | 12.45 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N (LTM well)

**Comments** SHP-2016-1B-SPR17 @ 1220

[signature]
**Signature**

5/23/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-3A

Project: SHL
Location: Fort Devens Massachusetts
Date: 5/23/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | ✓ |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 10.58 |
| Depth to bottom (ft ~~bgs~~ TOC) | 27.55 |
| Screen Interval (ft-~~bgs~~) | 20-25.0 BGS |
| Total volume purged (gal) | 5.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1305
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 076100 12-2
LaMotte 2020e A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1305 | 200 | 11.34 | 7.46 | 7.32 | 113 | 0.20 | -102.0 | 83.7 | Semi clarity |
| 1310 | | | 7.40 | 7.22 | 111 | 0.31 | -99.7 | 69.7 | " |
| 1315 | | | 7.36 | 7.19 | 110 | 0.40 | -90.1 | 57.5 | |
| 1320 | | | 7.39 | 7.16 | 109 | 0.56 | -83.6 | 52.6 | |
| 1325 | | | 7.50 | 7.13 | 104 | 0.82 | -77.1 | 47.0 | |
| 1330 | | | 7.40 | 7.08 | 103 | 1.10 | -73.2 | 44.7 | |
| 1335 | | | 7.31 | 7.09 | 100 | 1.24 | -70.4 | 39.5 | |
| 1340 | | | 7.32 | 7.08 | 98 | 1.46 | -65.8 | 36.7 | |
| 1345 | | | 7.23 | 7.07 | 97 | 1.51 | -63.9 | 35.8 | |
| 1350 | | | 7.27 | 7.06 | 97 | 1.53 | -62.4 | 35.5 | |
| 1355 | ↓ | ↓ | 7.26 | 7.06 | 97 | 1.59 | -61.9 | 35.1 | ↓ |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 145
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SHP-2016-3A-SPR17 @ 1400 LTM

[signature]
**Signature**

5/23/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-3B

Project: SML
Location: Fort Devens Massachusetts

Date: 5/23/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 10.52 |
| Depth to bottom (ft ~~bgs~~ TOC) | 57.65 |
| Screen Interval (ft-~~bgs~~) | 80-85.0 BGS |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1442
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): 912 556 07 6100122
L2 Mollie 2020WE A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1442 | 200 | 10.68 | 8.50 | 6.46 | 393 | 0.38 | -71.2 | 9.33 | clear |
| 1447 | ↓ | ↓ | 8.66 | 6.46 | 395 | 0.38 | -72.2 | 8.00 | ↓ |
| 1452 | ↓ | ↓ | 8.68 | 6.45 | 396 | 0.33 | -70.5 | 7.27 | ↓ |
| 1457 | ↓ | ↓ | 8.66 | 6.45 | 397 | 0.32 | -70.3 | 7.23 | ↓ |
| 1502 | ↓ | ↓ | 8.67 | 6.45 | 398 | 0.32 | -70.1 | 7.19 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SHP-2016-3B-SPR17 @ 1510 LTM

[signature]
**Signature**

5/23/17
Date

(p 1 of 2)

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMP-2016-4A

Project: SHL
Date: 5/24/17
Location: Fort Devens Massachusetts
Sampler: MA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 17.40 |
| Depth to bottom (ft bgs) | 32.80 |
| Screen Interval (ft-~~bgs~~) | 25-30 BGS |
| Total volume purged (gal) | 6.0 |

**Sampling Type**

Purging Method: Poly
Tubing type: Poly
Dedicated pump (Y/N): N
Purge start/stop time: 835
Tubing diameter: 1/4"
Air source: N/A
Field Instrument (Model/S/N): YSI 556 07F100 122
LaMotte 2020WE AQ2735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 835 | 150 | 17.67 | 8.30 | 4.00 | 114 | 0.26 | 107.0 | 1079 | cloudy |
| 840 | ↓ | ↓ | 8.34 | 4.82 | 112 | 0.27 | 55.4 | 1056 | ↓ |
| 845 | | | 8.46 | 5.47 | 111 | 0.24 | 11.9 | 1073 | |
| 850 | | | 8.50 | 5.89 | 110 | 0.27 | -9.6 | 969 | |
| 855 | | | 8.56 | 6.13 | 109 | 0.30 | -27.3 | 849 | |
| 900 | | | 8.67 | 6.44 | 107 | 0.29 | -44.7 | 739 | |
| 905 | | | 8.57 | 6.60 | 106 | 0.36 | -53.6 | 693 | |
| 910 | | | 8.71 | 6.79 | 105 | 0.37 | -59.8 | 666 | |
| 915 | | | 8.68 | 6.82 | 104 | 0.37 | -67.2 | 637 | |
| 920 | | | 8.90 | 6.94 | 103 | 0.40 | -70.6 | 359 | ↓ |
| 925 | | | 8.84 | 6.96 | 99 | 0.41 | -71.3 | 146 | slight cloudy |
| 930 | ↓ | ↓ | 9.22 | 6.95 | 99 | 0.54 | -71.6 | 79 | ↓ |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N):
Duplicate (Y/N): See next page
MS/MSD (Y/N): See next page
Filter Size: See next page
Dup ID/Time: See next page

**Comments** See next page

Signature

5/24/17
Date

(P 2 of 2)

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SMP-2016-4A

Project: SML
Location: Fort Devens Massachusetts
Date: 5/24/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | |
| Material | |
| Depth to water (ft-bgs) | |
| Depth to bottom (ft bgs) | |
| Screen Interval (ft-bgs) | |
| Total volume purged (gal) | |

See previous page

**Sampling Type** ☒ See previous page ☒

Purging Method: –
Purge start/stop time: –
Tubing type: –
Tubing diameter: –
Dedicated pump (Y/N): –
Air source: –
Field Instrument (Model/S/N): –

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 935 | 150 | 17.67 | 9.34 | 7.05 | 99 | 0.70 | -74.7 | 59 | Semi cloudy |
| 940 | ↓ | ↓ | 9.40 | 7.06 | 98 | 0.71 | -74.1 | 63 | ↓ |
| 945 | ↓ | ↓ | 9.93 | 7.06 | 98 | 0.72 | -74.6 | 62 | ↓ |
| 950 | ↓ | ↓ | 9.94 | 7.05 | 98 | 0.73 | -75.1 | 62 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): ~~N~~ Y
Dup ID/Time: DUP-5-SPR17 @ 1000
MS/MSD (Y/N): N

**Comments** SMP-2016-4A - SPR17 @ 955 LTM

[signature]
**Signature**

5/24/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-4B

Project: SHL
Location: Fort Devens Massachusetts
Date: 5/24/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 17.25 |
| Depth to bottom (ft-~~bgs~~ TOC) | 92.70 |
| Screen Interval (ft-~~bgs~~) | 85.90 BGS |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1100
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 076100 122
Lamotte 2020WE A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1100 | 200 | 17.27 | 8.99 | 6.34 | 407 | 0.68 | -78.9 | 9.96 | Clear |
| 1105 | ↓ | ↓ | 9.04 | 6.46 | 409 | 0.61 | -89.2 | 8.28 | ↓ |
| 1110 | ↓ | ↓ | 9.12 | 6.49 | 411 | 0.33 | -90.1 | 8.47 | ↓ |
| 1115 | ↓ | ↓ | 9.15 | 6.50 | 413 | 0.32 | -91.0 | 6.80 | ↓ |
| 1120 | ↓ | ↓ | 9.06 | 6.50 | 414 | 0.30 | -93.4 | 6.69 | ↓ |
| 1125 | ↓ | ↓ | 8.90 | 6.50 | 415 | 0.27 | -95.4 | 6.68 | ↓ |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SHP-2016-4B-SPR17 @ 1130 LTM

[signature]
**Signature**

5/24/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-02A

Project: SHL
Location: Fort Devens Massachusetts
Date: 5/24/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 13.40 |
| Depth to bottom (ft ~~bgs~~ TOC) | 28.49 |
| Screen Interval (ft-~~bgs~~) | 20-25 BG |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1155
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 07610012 2
Lamotte 2020-E A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1155 | 200 | 13.64 | 8.71 | 10.30 | 220 | 0.34 | -263.7 | 95.5 | Semi-cloudy |
| 1200 | | | 9.01 | 10.26 | 218 | 0.33 | -259.6 | 96.9 | |
| 1205 | | | 9.05 | 10.27 | 213 | 0.27 | -258.1 | 98.5 | |
| 1210 | | | 9.26 | 10.22 | 209 | 0.41 | -246.3 | 101.7 | |
| 1215 | | | 9.48 | 10.19 | 202 | 0.75 | -223.4 | 98.6 | |
| 1220 | | | 9.39 | 10.14 | 197 | 0.99 | -191.6 | 97.3 | |
| 1225 | | | 9.41 | 10.09 | 189 | 1.09 | -182.6 | 96.4 | |
| 1230 | | | 9.47 | 10.08 | 187 | 1.13 | -179.9 | 96.5 | |
| 1235 | | | 9.50 | 10.07 | 186 | 1.15 | -177.6 | 95.9 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SHP-2016-02A-SPR17 @ 1240 (LTM)

Semi Cloudy

[signature]
**Signature**

5/24/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SMP-2016-2B

Project: SML
Location: Fort Devens Massachusetts
Date: 5/24/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 13.40 |
| Depth to bottom (ft ~~bgs~~ TOC) | ~~[illegible]~~ 87.97 |
| Screen Interval (ft-~~bgs~~) | 80-85 BGS |
| Total volume purged (gal) | 5.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1315
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): 457 556 076100 122
LaMotte 2020WE A02/35

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1315 | 200 | 13.52 | 9.29 | 6.49 | 416 | 0.56 | -87.8 | 11.9 | clear |
| 1320 | ↓ | ↓ | 9.37 | 6.48 | 417 | 0.49 | -87.7 | 10.4 | ↓ |
| 1325 | ↓ | ↓ | 9.50 | 6.48 | 419 | 0.45 | -87.4 | 9.83 | ↓ |
| 1330 | ↓ | ↓ | 9.50 | 6.48 | 420 | 0.52 | -90.1 | 9.77 | ↓ |
| 1335 | ↓ | ↓ | 9.53 | 6.48 | 421 | 0.51 | -91.3 | 9.67 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SMP-2016-2B-SPR17 @ 1340 (LTM)

[signature]
**Signature**

5/24/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMP-2016-5A

Project: SHL
Location: Fort Devens Massachusetts
Date: 5/24/17
Sampler: KGA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | ✓ | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | ~~[illegible]~~ 14.43 |
| Depth to bottom (ft ~~bgs~~ TOC) | 32.85 |
| Screen Interval (ft-~~bgs~~) | 25-30 BGS |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1420
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 076100 122
LaMotte 2020 WE AQ735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1420 | 200 | 14.77 | 8.90 | 6.66 | 159 | 0.37 | -68.8 | 12.3 | Semi-cloudy |
| 1425 | ↓ | ↓ | 8.77 | 6.76 | 158 | 0.37 | -79.2 | 11.9 | ↓ |
| 1430 | ↓ | ↓ | 9.03 | 6.76 | 159 | 0.29 | -75.1 | 11.0 | ↓ |
| 1435 | ↓ | ↓ | 9.18 | 6.76 | 160 | 0.27 | -77.7 | 10.4 | ↓ |
| 1440 | ↓ | ↓ | 9.21 | 6.76 | 161 | 0.25 | -78.0 | 9.97 | ↓ |
| 1445 | ↓ | ↓ | 9.18 | 6.76 | 162 | 0.26 | -78.3 | 9.94 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SMP-2016-5A-SPR17 @1450

[signature]
**Signature**

5/24/17
Date

LTM

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-5B

Project: SML
Location: Fort Devens Massachusetts
Date: 5/24/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 14.40 |
| Depth to bottom (ft-~~bgs~~ TOC) | 92.43 |
| Screen Interval (ft-bgs) | 85-90 |
| Total volume purged (gal) | 5.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1525
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): [illegible] 076100 122
[illegible] 2020 E A0[illegible]

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1525 | 200 | 14.79 | 9.46 | 6.44 | 466 | 0.57 | -76.2 | 10.66 | clear |
| 1530 | | | 9.30 | 6.47 | 469 | 0.69 | -77.7 | 10.59 | |
| 1535 | | | 9.28 | 6.47 | 464 | 0.72 | -80.4 | 10.55 | |
| 1540 | | | 9.43 | 6.45 | 464 | 0.63 | -81.0 | 8.44 | |
| 1545 | | | 9.14 | 6.44 | 461 | 0.54 | -79.3 | 7.94 | |
| 1550 | | | 9.23 | 6.39 | 462 | 0.58 | -77.4 | 7.83 | |
| 1555 | ↓ | ↓ | 9.31 | 6.40 | 462 | 0.59 | -76.9 | 7.86 | ↓ |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SHP 2016-5B-SPT @ 1600 LTM

[signature]
**Signature**

5/24/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** EPA-PZ-2012-6A

Project: 1024-003 Shepley's Spr 17
Location: Fort Devens Massachusetts

Date: 5/24/17
Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-bgs) | 22.60 |
| Depth to bottom (ft bgs) | 33.34 |
| Screen Interval (ft-bgs) | 25-30 |
| Total volume purged (gal) | 3.00 |

**Sampling Type**

Purging Method: Peristaltic Low Flow
Purge start/stop time: 1120/1135
Tubing type: LDPE
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: NA
Field Instrument (Model/S/N): Lamotte 2020 WE (34 502-2313)

Geo Pump (Pine ID 21855)
Solinist $H_2O$ Meter (21202) YSI 650 MDS (00L1207AD)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1135 | 400 | 21.63 | 8.12 | 5.57 | 0.360 | 11.90 | 35.7 | 73.77 | Clear |
| 1140 | 225 | 21.63 | 8.45 | 5.65 | 0.384 | 11.66 | 31.7 | 23.86 | Clear |
| 1145 | 200 | 21.62 | 8.60 | 5.83 | 0.399 | 11.75 | 23.5 | 16.34 | Clear |
| 1150 | 200 | 21.62 | 8.75 | 5.92 | 0.406 | 11.69 | 19.3 | 15.65 | Clear |
| 1155 | 200 | 21.62 | 8.66 | 5.95 | 0.407 | 11.97 | 18.8 | 12.13 | Clear |
| 1200 | 200 | 21.62 | 8.70 | 5.97 | 0.408 | 12.00 | 18.4 | 13.30 | Clear |
| 1205 | 200 | 21.62 | 8.71 | 5.98 | 0.407 | 11.98 | 18.3 | 13.48 | Clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

EPA-PZ-2012-6A_SPR17 @ 1207

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45um
Duplicate (Y/N): N
Dup ID/Time:
MS/MSD (Y/N): N

**Comments**

Melissa Miller
Signature

5/24/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-2012-6B

Project: 1024-003 Shepley's SPR 17 Date: 5/24/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-bgs) TPVC | 21.65 |
| Depth to bottom (ft bgs) TPVC | 81.99 |
| Screen Interval (ft-bgs) | 75-80 |
| Total volume purged (gal) | 4.00 |

**Sampling Type** Peristaltic

Purging Method Low Flow Tubing type LDPE Dedicated pump (Y/N) N

Purge start/stop time 1225/1240 Tubing diameter 1/4" Air source NA

Field Instrument (Model/S/N) Lamotte 2020WE

Geopump (Pine ID 21855), Solinist H2O meter (20202), YSI650MDS (00L1207 AD), (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1240 | 400 | 21.60 | 8.88 | 6.06 | 0.258 | 0.71 | -20.7 | 15.62 | Clear |
| 1245 | 175 | 21.60 | 9.09 | 6.16 | 0.261 | 0.79 | -27.2 | 13.54 | Clear |
| 1250 | 175 | 21.61 | 9.45 | 6.24 | 0.266 | 1.00 | -30.6 | 13.26 | Clear |
| 1255 | 175 | 21.61 | 9.59 | 6.35 | 0.268 | 0.86 | -39.1 | 11.38 | Clear |
| 1300 | 175 | 21.61 | 9.47 | 6.40 | 0.268 | 0.70 | -38.6 | 12.60 | Clear |
| 1305 | 175 | 21.61 | 9.46 | 6.41 | 0.268 | 0.69 | -39.0 | 10.00 | Clear |
| 1310 | 175 | 21.61 | 9.44 | 6.42 | 0.268 | 0.67 | -38.9 | 9.39 | Clear |
| 1315 | 175 | 21.61 | 9.45 | 6.42 | 0.268 | 0.66 | -38.7 | 9.46 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

EPA-PZ-2012-6B - SPR17 @ 1317

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45µM Dup ID/Time: —

**Comments**

LTM

Melissa A Miller

**Signature**

5/24/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-2012-7A

Project: 1024-003 Shepleys SPR 17 Date: 5/24/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | X | | |
| Locked (stickup wells) | | | X |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TPVC) | 21.45 |
| Depth to bottom (ft-~~bgs~~ TPVC) | 29.43 |
| Screen Interval (ft-~~bgs~~ TPVC) | 25-30 BGS |
| Total volume purged (gal) | 4.00 |

**Sampling Type**

Purging Method Peristaltic Low flow Tubing type LDPE Dedicated pump (Y/N) N

Purge start/stop time 1350/1405 Tubing diameter 1/4" Air source N/A

Geo Pump (Pine ID 21855) Field Instrument (Model/S/N) Lamotte 2020 WE (3450-2313)

Solinist $H_2O$ meter (212202) YSI 650 MDS (00L1207AD)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1405 | 400 | 21.60 | 11.49 | 6.09 | 0.792 | 8.52 | 28.5 | 113.50 | Grey/cloudy |
| 1410 | 200 | 21.61 | 11.27 | 6.08 | 0.793 | 8.31 | 33.7 | 14.77 | Clear |
| 1415 | 200 | 21.61 | 11.79 | 6.06 | 0.802 | 8.15 | 36.2 | 13.73 | Clear |
| 1420 | 200 | 21.52 | 11.80 | 6.06 | 0.808 | 8.14 | 36.8 | 14.00 | Clear |
| 1425 | 200 | 21.52 | 11.78 | 6.04 | 0.808 | 8.21 | 38.1 | 10.84 | Clear |
| 1430 | 200 | 21.52 | 11.80 | 6.03 | 0.809 | 8.40 | 38.2 | 10.01 | Clear |
| 1435 | 200 | 21.52 | 11.78 | 6.03 | 0.809 | 8.41 | 38.1 | 8.30 | Clear |
| 1440 | 200 | 21.52 | 11.81 | 6.02 | 0.810 | 8.38 | 38.0 | 8.50 | Clear |
| 1445 | 200 | 21.52 | 11.82 | 6.01 | 0.812 | 8.35 | 38.0 | 8.70 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

EPA-PZ-2012-7A_SPR17 1447

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45um Dup ID/Time: —

**Comments** Replaced tubing

Melissa Miller

**Signature**

5/24/17

Date

LAM

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** EPA-PZ-2012-7B

Project: 1024-003 Shepleys SPR17 Date: 5/24/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | X | | |
| Locked (stickup wells) | | | X |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TPVC) | 21.45 |
| Depth to bottom (ft ~~bgs~~ TPVC) | 64.68 |
| Screen Interval (ft-~~bgs~~ TPVC) | 60-65 BGS |
| Total volume purged (gal) | 3.75 |

**Sampling Type**

Purging Method: Peristaltic Low flow

Purge start/stop time: 1505 / 1520

Tubing type: LDPE

Tubing diameter: 1/4"

Dedicated pump (Y/N): N

Air source: NA

Field Instrument (Model/S/N): Lamotte 2020 WE (3450-23131)

YSI 650 MDS (00L1207AD)

Geo pump (Pine ID 21855)

Solinist H2O meter (212202)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1520 | 400 | 21.51 | 10.97 | 6.10 | 0.176 | 0.42 | -56.5 | 31.82 | Clear |
| 1525 | 200 | 21.49 | 11.48 | 6.33 | 0.175 | 0.45 | -53.4 | 23.19 | Clear |
| 1530 | 200 | 21.49 | 11.50 | 6.40 | 0.175 | 0.46 | -56.8 | 13.63 | Clear |
| 1535 | 200 | 21.49 | 11.49 | 6.42 | 0.175 | 0.45 | -58.3 | 11.84 | Clear |
| 1540 | 200 | 21.49 | 11.51 | 6.45 | 0.175 | 0.43 | -58.1 | 11.81 | Clear |
| 1545 | 200 | 21.49 | 11.50 | 6.45 | 0.175 | 0.41 | -58.1 | 11.35 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

EPA-PZ-2012-7B_SPR17@1547

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45um Dup ID/Time: —

**Comments** Replaced Tubing

[signature]

**Signature**

5/24/17

Date

LAM

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-P2-2012-3A

Project: 1024-003 Shepleys Spring 17 Date: 5/25/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 9.87 |
| Depth to bottom (ft ~~bgs~~ TOC) | 27.55 |
| Screen Interval (ft-~~bgs~~ TOC) | 20-25 |
| Total volume purged (gal) | 4.75 |

BG-5

**Sampling Type** Peristaltic

Purging Method Low flow Tubing type LDPE Dedicated pump (Y/N) N

Purge start/stop time 925/945 Tubing diameter 1/4" Air source NA

Geopump (Pine ID 21855) Field Instrument (Model/S/N) Lamotte 2020wi (3450-2313)

Solinist H2O meter (218202) YSI 650 MDS (00L1207 AD)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 945 | 400 | 10.09 | 9.66 | 5.82 | 0.542 | 1.46 | -6.1 | 9.01 | Clear |
| 950 | 200 | 9.88 | 9.75 | 5.81 | 0.539 | 1.07 | -8.6 | 8.12 | Clear |
| 955 | 200 | 9.98 | 9.98 | 5.83 | 0.540 | 1.11 | -9.9 | 11.01 | Clear |
| 1000 | 200 | 10.01 | 10.09 | 5.83 | 0.538 | 1.14 | -11.1 | 8.33 | Clear |
| 1005 | 200 | 10.01 | 10.01 | 5.83 | 0.536 | 1.05 | -11.3 | 9.80 | Clear |
| 1010 | 200 | 10.01 | 10.01 | 5.83 | 0.535 | 1.10 | -11.7 | 9.78 | Clear |
| 1015 | 200 | 10.01 | 10.01 | 5.85 | 0.534 | 1.09 | -11.5 | 9.76 | Clear |
| 1020 | 200 | 10.01 | 10.01 | 5.85 | 0.534 | 1.08 | -11.5 | 9.78 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

EPA-P2-2012-3A-SPR17@ 1022 **Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45um Dup ID/Time: —

**Comments** LM

Melissa Miller 5/25/17

**Signature** Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-2012-3B

Project: 1024-003 Shepley's SPR17 Date: 5/25/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-bgs) | 9.89 |
| Depth to bottom (ft-bgs) | 87.65 |
| Screen Interval (ft-bgs) | 70-75 BGS |
| Total volume purged (gal) | 5.00 |

**Sampling Type** Peristaltic pump

Purging Method Low flow Tubing type LDPE Dedicated pump (Y/N) N

Purge start/stop time 1030/1045 Tubing diameter 1/4" Air source NA

Field Instrument (Model/S/N) YSI 650 MDS (00L1207 AD)

GeoPump (Pine ID 21855)

Solinist $H_2O$ meter (21202)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1045 | 400 | 10.45 | 9.88 | 6.37 | 0.658 | 0.59 | -58.2 | 144 | very cloudy |
| 1050 | 400 | 10.46 | 9.99 | 6.48 | 0.657 | 4.19 | -61.2 | 125 | white / cloudy |
| 1055 | 200 | 10.27 | 10.20 | 6.53 | 0.657 | 3.78 | -63.9 | 48.86 | white / cloudy |
| 1100 | 200 | 10.27 | 10.21 | 6.53 | 0.658 | 2.55 | -65.1 | 64.50 | white/cloudy |
| 1105 | 200 | 10.27 | 10.20 | 6.52 | 0.657 | 3.16 | -66.2 | 56.10 | white /cloudy |
| 1110 | 200 | 10.26 | 10.17 | 6.53 | 0.658 | 3.11 | -67.2 | 52.70 | white / cloudy |
| 1115 | 175 | 10.26 | 10.29 | 6.54 | 0.658 | 2.09 | -67.5 | 41.02 | white / cloudy |
| 1120 | 175 | 10.26 | 10.30 | 6.54 | 0.658 | 2.45 | -65.9 | 33.98 | cloudy/ clear |
| 1125 | 175 | 10.26 | 10.31 | 6.55 | 0.658 | 2.43 | -65.7 | 22.24 | clear |
| 1130 | 175 | 10.26 | 10.31 | 6.55 | 0.658 | 2.42 | -65.7 | 22.17 | clear |
| 1135 | 175 | 10.26 | 10.31 | 6.55 | 0.658 | 2.41 | -65.7 | 21.98 | clear |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

EPA-PZ-2012-3B_SPR17 @ 1137

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45µm Dup ID/Time: —

**Comments** LTM

Signature

5/25/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-P2-2012-1A

Project: 1024-003 Sheehy's SPR 17
Location: Fort Devens Massachusetts
Date: 5/25/17
Sampler: Melissa Milke

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-bgs) | 10.40 |
| Depth to bottom (ft bgs) | 28.07 |
| Screen Interval (ft-bgs) | 20-25 ft bgs |
| Total volume purged (gal) | 4.75 |

**Sampling Type** peristaltic
Purging Method Low flow
Purge start/stop time 1430/1450
Tubing type LDPE
Tubing diameter 1/4"
Dedicated pump (Y/N) N
Air source —
Field Instrument (Model/S/N) Lamotte 2020wt (3450-2313)

Geo Pump (Pine ID 21855)
Solinist H2O meter (212202), YSI 650 MDS (001207AD)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1450 | 400 | 10.99 | 7.74 | 5.97 | 0.222 | 0.63 | 49.7 | 10.45 | clear |
| 1455 | 200 | 10.87 | 7.83 | 5.96 | 0.220 | 0.58 | 46.8 | 9.56 | Clear |
| 1500 | 200 | 10.86 | 7.95 | 5.98 | 0.219 | 0.68 | 43.6 | 9.53 | Clear |
| 1505 | 200 | 10.85 | 7.97 | 5.99 | 0.218 | 0.58 | 40.2 | 8.44 | Clear |
| 1510 | 200 | 10.85 | 7.97 | 5.99 | 0.218 | 0.56 | 37.1 | 7.82 | Clear |
| 1515 | 200 | 10.85 | 7.97 | 5.99 | 0.219 | 0.55 | 36.9 | 7.67 | Clear |
| 1520 | 200 | 10.85 | 7.97 | 5.99 | 0.219 | 0.54 | 36.5 | 7.63 | Clear |
| 1525 | 200 | 10.85 | 7.97 | 5.99 | 0.217 | 0.54 | 36.2 | 7.59 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

EPA-P2-2012-1A_SPR17 @ 1527

**Sampling Details**

Field Filtered (Y/N): Y
Duplicate (Y/N): N
MS/MSD (Y/N): N
Filter Size: .45µm
Dup ID/Time: —

**Comments** LTM

Melissa A Milke
**Signature**

5/25/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-2012-1B

Project: ~~EPA~~ 1024-003, Shepley's SPR 17 Date: 5/25/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 10.27 |
| Depth to bottom (ft ~~bgs~~ TOC) | 77.82 |
| Screen Interval (ft-bgs) | 70-75 |
| Total volume purged (gal) | 5.00 |

**Sampling Type**

Purging Method Peristaltic Low Flow Tubing type LDPE Dedicated pump (Y/N) N

Purge start/stop time 1537 1555 Tubing diameter 1/4" Air source

GEO Pump / Pine ED (21855) Field Instrument (Model/S/N) Lamotte 2020 we

Solinist $H_2O$ meter (212202) YSI 650 MDS (001307 AD) (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1555 | 400 | 10.85 | 9.59 | 6.34 | 0.605 | 0.45 | -21.1 | 211.25 | white/cloudy |
| 1600 | 400 | 10.85 | 9.63 | 6.34 | 0.606 | 0.49 | -26.5 | 84.85 | clear/cloudy |
| 1605 | 200 | 10.65 | 9.56 | 6.35 | 0.606 | 0.51 | -26.2 | 93.29 | cloudy/clear |
| 1610 | 200 | 10.65 | 9.45 | 6.36 | 0.605 | 0.53 | -24.5 | 41.15 | cloudy/clear |
| 1615 | 200 | 10.63 | 9.38 | 6.36 | 0.605 | 0.52 | -24.1 | 29.85 | clear/cloudy |
| 1620 | 200 | 10.63 | 9.42 | 6.37 | 0.605 | 0.53 | -23.4 | 28.30 | clear/cloudy |
| 1625 | 200 | 10.63 | 9.43 | 6.37 | 0.605 | 0.52 | -23.7 | 27.70 | clear/cloudy |
| 1630 | 200 | 10.63 | 9.44 | 6.37 | 0.605 | 0.53 | -23.5 | 27.67 | clear/cloudy |
| 1635 | 200 | 10.63 | 9.44 | 6.37 | 0.605 | 0.52 | -23.5 | 26.97 | clear/cloudy |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

EPA-PZ-2012-1B SPR 17 @ 1637

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45um Dup ID/Time: —

**Comments** LAM

Melissa Miller
**Signature**

5/25/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-P2-2012-4A

Project: 1024-003 Sheepleys SPR17 Date: 5/25/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-bgs) TPVC | 14.08 |
| Depth to bottom (ft bgs) TPVC | 32.80 |
| Screen Interval (ft-bgs) TPVC | 20-25 |
| Total volume purged (gal) | 3.75 |

**Sampling Type** Peristaltic

Purging Method Low flow

Purge start/stop time 1150/1205

Geo pump (Pine ID 21855)

Solinist $H_2O$ meter (Q12202)

Tubing type LDPE

Tubing diameter 1/4"

Dedicated pump (Y/N) N

Air source NA

Field Instrument (Model/S/N) ~~Lamotte 2020WE~~ 73450-2313

YSI 650 MDS (00L1207 AD)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1205 | 400 | 14.14 | 9.47 | 6.31 | 0.366 | 0.34 | 7.5 | 10.31 | Clear |
| 1210 | 200 | 14.13 | 9.56 | 6.32 | 0.367 | 0.33 | 1.6 | 9.97 | Clear |
| 1215 | 200 | 14.13 | 9.72 | 6.33 | 0.368 | 0.34 | -0.1 | 9.57 | Clear |
| 1220 | 200 | 14.12 | 9.80 | 6.35 | 0.369 | 0.54 | -2.8 | 8.73 | Clear |
| 1225 | 200 | 14.12 | 9.85 | 6.35 | 0.368 | 0.38 | -3.3 | 8.53 | Clear |
| 1230 | 200 | 14.12 | 9.84 | 6.35 | 0.368 | 0.38 | -3.5 | 6.92 | Clear |
| 1235 | 200 | 14.12 | 9.83 | 6.34 | 0.368 | 0.38 | -4.5 | 6.43 | Clear |
| 1240 | 200 | 14.12 | 9.84 | 6.34 | 0.368 | 0.38 | -4.0 | 6.42 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

EPA-P2-2012-4A SPR17 @ 1242

**Sampling Details**

Field Filtered (Y/N): Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45 µm Dup ID/Time: —

**Comments**

Signature

5/25/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** EPA-PZ-2012-4B

Project: 1024-003 Shepley's Spr. 2017 Date: 5/25/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TPVC) | 14.07 |
| Depth to bottom (ft ~~bgs~~ TPVC) | 92.70 |
| Screen Interval (~~ft-bgs~~) | 70-75 ft bgs |
| Total volume purged (gal) | 3.75 |

**Sampling Type**

Purging Method Peristaltic Low flow Tubing type LDPE Dedicated pump (Y/N) N

Purge start/stop time 1315/1330 Tubing diameter 1/4 Air source NA

Geo pump (pine ID 21855) Field Instrument (Model/S/N) Lamotte 2020 we (3450-2313)

Solinist $H_2O$ meter (212202 YSI 650 MDS (00L1207 AD)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1330 | 400 | 14.08 | 10.30 | 6.44 | 0.673 | 0.51 | -59.5 | 15.70 | clear |
| 1335 | 400 | 14.08 | 10.17 | 6.44 | 0.675 | 0.55 | -61.7 | 12.20 | clear |
| 1340 | 200 | 14.07 | 10.29 | 6.45 | 0.672 | 0.50 | -61.4 | 11.31 | clear |
| 1345 | 200 | 14.07 | 10.25 | 6.45 | 0.671 | 0.52 | -63.4 | 12.12 | clear |
| 1350 | 200 | 14.07 | 10.25 | 6.45 | 0.672 | 0.52 | -64.5 | 10.74 | clear |
| 1355 | 200 | 14.07 | 10.26 | 6.45 | 0.671 | 0.52 | -63.9 | 10.80 | clear |
| 1400 | 200 | 14.07 | 10.25 | 6.45 | 0.670 | 0.52 | -64.2 | 10.50 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

EPA-PZ-2012-4B_SPR17 @ 1402

Field Filtered (Y/N): Y Duplicate (Y/N): Y MS/MSD (Y/N): N

Filter Size: .45 µm Dup ID/Time: SHL_DUP04-SPR17.0 1408

★ Field

**Comments** Duplicate

LJM

Melissa Miller

**Signature**

5/25/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** PZ-12-01

Project: SHL
Location: Fort Devens Massachusetts
Date: 5/25/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 20.37 |
| Depth to bottom (ft ~~bgs~~ TOC) | 35.27 |
| Screen Interval (ft-~~bgs~~) | 24-34 BGS |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 900
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 076 100 122
LaMotte 2020WF A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 900 | 200 | 20.41 | 10.50 | 5.59 | 418 | 0.68 | -8.8 | 15.5 | Clear |
| 905 | ↓ | ↓ | 10.50 | 5.73 | 417 | 0.59 | -19.7 | 12.6 | ↓ |
| 910 | ↓ | ↓ | 10.42 | 5.88 | 417 | 0.54 | -27.2 | 12.3 | ↓ |
| 915 | ↓ | ↓ | 10.39 | 5.87 | 416 | 0.55 | -19.8 | 11.9 | ↓ |
| 920 | ↓ | ↓ | 10.41 | 5.88 | 416 | 0.53 | -18.7 | 12.2 | ↓ |
| 925 | ↓ | ↓ | 10.49 | 5.89 | 416 | 0.52 | -18.6 | 12.1 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** PZ-12-01-SPR17 @ 930 LTM

[signature]
**Signature**

5/25/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** PZ-12-02

Project: SHL
Location: Fort Devens Massachusetts
Date: 5/25/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~ TOC) | 19.82 | |
| Depth to bottom (ft ~~bgs~~ TOC) | 33.91 | |
| Screen Interval (ft-~~bgs~~) | 24-34 | BGS |
| Total volume purged (gal) | 3.0 | |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1005
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 07 & 100 [illegible]
LaMotte Zolowe A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1000 1005 | 200 | 19.91 | 10.14 | 5.94 | 375 | 0.37 | -28.0 | 11.20 | Clear |
| 1005 1010 | ↓ | ↓ | 10.15 | 6.00 | 375 | 0.35 | -31.9 | 10.40 | ↓ |
| 1010 1015 | ↓ | ↓ | 10.17 | 6.01 | 377 | 0.33 | -33.3 | 10.33 | ↓ |
| 1015 1020 | ↓ | ↓ | 10.18 | 6.01 | 378 | 0.34 | -34.6 | 10.31 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** PZ-12-02-SPR17 @1025 LTM

[signature]
**Signature**

5/25/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** PZ-12-03

Project: SHL
Location: Fort Devens Massachusetts

Date: 5/25/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 19.46 |
| Depth to bottom (ft ~~bgs~~ TOC) | 36.31 |
| Screen Interval (ft-~~bgs~~) | 22-32 BGS |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method peristaltic
Purge start/stop time 1110
Tubing type poly
Tubing diameter 1/4"
Dedicated pump (Y/N) Tubing
Air source N/A
Field Instrument (Model/S/N) YSI 556 07G100 122
LaMotte 2020WE A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1110 | 200 | 19.67 | 9.60 | 6.13 | 269 | 0.51 | 23.1 | 37.6 | clear |
| 1115 | | | 9.99 | 6.18 | 301 | 0.43 | 21.6 | 29.3 | |
| 1120 | | | 10.19 | 6.23 | 345 | 0.37 | 19.1 | 11.5 | |
| 1125 | | | 10.09 | 6.30 | 350 | 0.31 | -41.7 | 11.7 | |
| 1130 | | | 10.00 | 6.34 | 357 | 0.28 | -57.3 | 11.88 | |
| 1135 | | | 10.02 | 6.34 | 357 | 0.28 | -61.4 | 10.93 | |
| 1140 | | | 10.03 | 6.35 | 358 | 0.29 | -63.2 | 10.91 | |
| 1145 | ↓ | ↓ | 10.04 | 6.35 | 359 | 0.30 | -64.1 | 10.92 | ↓ |
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| Acceptance Criteria: | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% |
|---|---|---|---|---|---|---|---|

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** PZ-12-03-SPR17 @ 1150 CTM

[illegible]
**Signature**

5/25/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** PZ-12-04

| | | | |
|---|---|---|---|
| Project: | JHL | Date: | 5/25/17 |
| Location: | Fort Devens Massachusetts | Sampler: | KBA |

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 19.46 |
| Depth to bottom (ft ~~bgs~~ TOC) | 36.74 |
| Screen Interval (ft-~~bgs~~) | 22-32 BGS |
| Total volume purged (gal) | 3.0 |

**Sampling Type**

Purging Method: geotech

Purge start/stop time: 1235

Tubing type: poly

Tubing diameter: 1/4"

Dedicated pump (Y/N): ~~N~~ Tubing

Air source: N/A

Field Instrument (Model/S/N): YSI 556 07L100 122

LaMotte 2020WE A027135

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1235 | 200 | 19.53 | 10.46 | 6.30 | 257 | 0.35 | -53.3 | 11.60 | clear |
| 1240 | ↓ | ↓ | 10.46 | 6.31 | 257 | 0.32 | -58.9 | 10.13 | ↓ |
| 1245 | ↓ | ↓ | 10.47 | 6.30 | 257 | 0.30 | -60.8 | 9.73 | ↓ |
| 1250 | ↓ | ↓ | 10.42 | 6.30 | 258 | 0.30 | -61.7 | 9.71 | ↓ |
| 1255 | ↓ | ↓ | 10.43 | 6.30 | 258 | 0.29 | -61.9 | 9.69 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

| | | | | | |
|---|---|---|---|---|---|
| Field Filtered (Y/N): | Y | Duplicate (Y/N): | N | MS/MSD (Y/N): | N |
| Filter Size: | .45 | Dup ID/Time: | NA | | |

**Comments** PZ-12-04- SPR17 @ 1300 LTM

PZ-12 [illegible]

**Signature**

5/25/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** PZ-12-05

Project: SML
Location: Fort Devens Massachusetts

Date: 5/25/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 21.52 |
| Depth to bottom (ft ~~bgs~~ TOC) | 24.23 |
| Screen Interval (ft-~~bgs~~) | 26-36 BGS |
| Total volume purged (gal) | 3.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1350
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 076100 [illegible]
LaMotte 2020WE AQ 2735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1350 | 200 | 21.41 | 10.04 | 6.26 | 134 | 0.65 | -35.4 | 16.8 | clear |
| 1355 | ↓ | ↓ | 10.03 | 6.26 | 132 | 0.49 | -37.7 | 12.4 | ↓ |
| 1400 | ↓ | ↓ | 10.01 | 6.26 | 131 | 0.32 | -39.1 | 7.93 | ↓ |
| 1405 | ↓ | ↓ | 10.03 | 6.26 | 130 | 0.31 | -42.6 | 6.94 | ↓ |
| 1410 | ↓ | ↓ | 10.07 | 6.27 | 129 | 0.28 | -43.9 | 6.90 | ↓ |
| 1415 | ↓ | ↓ | 10.05 | 6.27 | 128 | 0.27 | -44.7 | 6.91 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** PZ-12-05 - SPR17 @ 1420 (LTM)

[signature]
**Signature**

5/25/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** PZ-12-06

Project: SHL
Location: Fort Devens Massachusetts
Date: 5/25/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 23.20 |
| Depth to bottom (ft ~~bgs~~ TOC) | 35.64 |
| Screen Interval (ft-bgs) | 26-36 |
| Total volume purged (gal) | 3.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1515
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 07L608 122
LaMotte 2020WE A-0715

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1515 | 200 | 23.28 | 9.91 | 6.41 | 123 | 0.34 | -17.8 | 8.70 | clear |
| 1520 | ↓ | ↓ | 9.94 | 6.18 | 123 | 0.33 | -18.7 | 8.50 | ↓ |
| 1525 | ↓ | ↓ | 9.93 | 6.36 | 124 | 0.33 | -21.1 | 8.49 | ↓ |
| 1530 | ↓ | ↓ | 9.97 | 6.37 | 128 | 0.32 | -22.1 | 8.47 | ↓ |
| 1535 | ↓ | ↓ | 9.98 | 6.38 | 129 | 0.32 | -24.3 | 8.46 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): Y
Dup ID/Time: SHL-DUP-1 SPR17 @ 1550 (LTM)
MS/MSD (Y/N): N

**Comments** PZ-12-06-SPR17 @ 1540 (LTM)

[illegible]
**Signature**

5/25/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-2012-2A

Project: 1024-003 Shepleys Spring 2017 | Date: 5/31/17

Location: Fort Devens Massachusetts | Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 9.94 |
| Depth to bottom (ft-~~bgs~~ TOC) | 28.38 |
| Screen Interval (ft-bgs) | 20-25 |
| Total volume purged (gal) | 4.75 |

**Sampling Type** Peristaltic

Purging Method: Low flow | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 936 / 946 | Tubing diameter: 1/4" | Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 946 | 500 | 10.15 | 7.98 | 6.55 | 0.078 | 3.20 | 87.8 | 15.61 | Clear |
| 951 | 275 | 9.91 | 8.48 | 6.35 | 0.074 | 3.01 | 64.6 | 14.34 | Clear |
| 956 | 225 | 9.86 | 8.75 | 6.34 | 0.080 | 3.05 | 51.9 | 8.41 | Clear |
| 1001 | 150 | 9.83 | 9.04 | 6.33 | 0.079 | 3.27 | 41.6 | 8.29 | Clear |
| 1006 | 150 | 9.85 | 9.10 | 6.28 | 0.079 | 3.25 | 37.0 | 8.11 | Clear |
| 1011 | 150 | 9.85 | 9.27 | 6.21 | 0.078 | 3.14 | 36.1 | 8.01 | Clear |
| 1016 | 150 | 9.85 | 8.91 | 6.12 | 0.079 | 3.02 | 37.0 | 7.25 | Clear |
| 1021 | 150 | 9.85 | 8.91 | 6.06 | 0.079 | 3.01 | 36.9 | 6.79 | Clear |
| 1026 | 150 | 9.85 | 8.92 | 6.00 | 0.079 | 3.00 | 36.8 | 6.77 | Clear |
| 1031 | 150 | 9.85 | 8.91 | 5.99 | 0.079 | 3.01 | 36.7 | 6.73 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

EPA-PZ-2012-2A_SPR17

**Sampling Details**

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): N

Filter Size: .45um | Dup ID/Time: —

Sample Time: 1033

omments Dedicated Tubing

LM

Melissa Miller

**Signature**

5/31/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-2012-2B-

Project: 1024-003 Shepleys Spring 2017
Location: Fort Devens Massachusetts
Date: 5/31/17
Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TVC) | 9.83 |
| Depth to bottom (ft ~~bgs~~ TVC) | 83.38 |
| Screen Interval (ft-~~bgs~~) | 75-80 BGS |
| Total volume purged (gal) | 6.00 |

**Sampling Type**

Purging Method: Peristaltic Low Flow
Purge start/stop time: 1055/1120
Tubing type: LDPE
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1120 | 450 | 10.06 | 10.35 | 6.00 | 0.400 | 0.61 | 15.6 | 11.97 | Clear |
| 1125 | 175 | 9.99 | 10.87 | 6.08 | 0.400 | 0.78 | 11.7 | 10.22 | Clear |
| 1130 | 175 | 9.98 | 10.97 | 6.08 | 0.400 | 0.75 | 11.6 | 11.32 | Clear |
| 1135 | 175 | 9.96 | 10.73 | 6.08 | 0.400 | 0.64 | 12.4 | 10.92 | Clear |
| 1140 | 150 | 9.96 | 10.90 | 6.08 | 0.400 | 0.67 | 13.2 | 10.32 | Clear |
| 1145 | 150 | 9.96 | 10.86 | 6.08 | 0.400 | 0.67 | 13.5 | 13.41 | Clear |
| 1150 | 150 | 9.96 | 10.79 | 6.08 | 0.401 | 0.64 | 13.8 | 12.13 | Clear |
| 1155 | 150 | 9.96 | 10.83 | 6.08 | 0.400 | 0.65 | 14.0 | 11.80 | Clear |
| 1200 | 150 | 9.96 | 10.89 | 6.09 | 0.400 | 0.66 | 14.2 | 8.91 | Clear |
| 1205 | 150 | 9.96 | 10.90 | 6.09 | 0.401 | 0.65 | 14.4 | 8.85 | Clear |
| 1210 | 150 | 9.96 | 10.91 | 6.09 | 0.400 | 0.66 | 14.6 | 8.45 | Clear |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

EPA-PZ-2012-2B-SPR17

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45um
Sample Time: 1212
Duplicate (Y/N): N
Dup ID/Time:
MS/MSD (Y/N): N

omments Has probe

LM

Melissa Miller
Signature

5/31/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SML-11

Project: SML
Location: Fort Devens Massachusetts

Date: 5/31/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4 |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 18.44 |
| Depth to bottom (ft ~~bgs~~ TOC) | 29.68 |
| Screen Interval (ft-~~bgs~~) | 12-27 BGS |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1015
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556MPS 07610022
Lamotte 2020e A0275

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1015 | 200 | 18.41 | 10.26 | 5.54 | 405 | 0.55 | -29.1 | 15.36 | clear |
| 1020 | ↓ | 18.41 | 10.20 | 6.00 | 404 | 0.48 | -57.2 | 12.7 | ↓ |
| 1025 | ↓ | 18.41 | 10.19 | 6.11 | 404 | 0.43 | -61.2 | 12.9 | ↓ |
| 1030 | ↓ | 18.41 | 10.21 | 6.19 | 403 | 0.42 | -67.9 | 13.0 | ↓ |
| 1035 | ↓ | 18.41 | 10.22 | 6.24 | 404 | 0.40 | -69.6 | 12.8 | ↓ |
| 1040 | ↓ | 18.41 | 10.23 | 6.22 | 404 | 0.39 | -70.3 | 12.9 | ↓ |
| 1045 | ↓ | 18.41 | 10.25 | 6.23 | 404 | 0.38 | -70.9 | 12.8 | ↓ |
| | | | | | | | | | |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SML-11-SPR17 @ 1050 (LTM)

[illegible]
**Signature**

5/31/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-11-02

Project: SHL
Location: Fort Devens Massachusetts
Date: 5/31/17
Sampler: VGA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | ✓ | ✓ |
| Well gripper present | | | ✓ |
| Bolts present | ✓ | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | Steel (no PVC casing) |
| Depth to water (ft-~~bgs~~ TOC) | 22.29 |
| Depth to bottom (ft ~~bgs~~ TOC) | 68.27 |
| Screen Interval (ft-~~bgs~~) | 39-49 BGS |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1255
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 07610022
LaMotte 2020 we A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1255 | 200 | 22.92 | 12.59 | 7.27 | 331 | 0.45 | -175.6 | 11.9 | clear |
| 1300 | ↓ | 23.07 | 12.51 | 7.30 | 332 | 0.36 | -182.7 | 9.67 | ↓ |
| 1305 | ↓ | 23.26 | 12.30 | 7.37 | 321 | 0.27 | -197.3 | 8.45 | ↓ |
| 1310 | ↓ | 23.49 | 12.26 | 7.38 | 317 | 0.20 | -205.3 | 8.21 | ↓ |
| 1315 | ↓ | 23.60 | 12.30 | 7.38 | 315 | 0.19 | -206.9 | 8.15 | ↓ |
| 1320 | ↓ | 23.79 | 12.27 | 7.39 | 312 | 0.19 | -209.6 | 8.14 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SHM-11-02-SPR17 @ 1325 (LTM)

Signature

Date 5/31/17

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SML-20

Project: SML
Location: Fort Devens Massachusetts

Date: 5/3/17
Sampler: WA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 17.70 |
| Depth to bottom (ft ~~bgs~~ TOC) | 50.14 |
| Screen Interval (ft-~~bgs~~ TOC) | 39-49 |
| Total volume purged (gal) | 4.0 |

BOS

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1120
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 07 blue, LaMotte 2020we 102735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1120 | 200 | 17.64 | 11.07 | 6.28 | 269 | 5.12 | 35.1 | 12.4 | clear |
| 1125 | ↓ | 17.64 | 11.27 | 6.30 | 329 | 2.39 | -12.1 | 10.3 | ↓ |
| 1130 | ↓ | 17.64 | 11.29 | 6.34 | 373 | 1.01 | -48.9 | 9.06 | ↓ |
| 1135 | ↓ | 17.64 | 11.39 | 6.42 | 400 | 0.69 | -62.1 | 9.02 | ↓ |
| 1140 | ↓ | 17.64 | 11.41 | 6.43 | 441 | 0.36 | -79.1 | 9.00 | ↓ |
| 1145 | ↓ | 17.64 | 11.40 | 6.42 | 447 | 0.33 | -82.3 | 8.83 | ↓ |
| 1150 | ↓ | 17.64 | 11.39 | 6.43 | 449 | 0.32 | -84.9 | 8.76 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): Y
Dup ID/Time: SML-DUP-2-SPR17 @ 1210
MS/MSD (Y/N): N

**Comments** SML-20-SPR17 @ 1155 (LTM)

Signature

Date: 5/3/17

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-96-5B

Project: 1024-003 Shepleys Spring 2017 Date: 5/31/17

Location: Fort Devens Massachusetts Sampler: LV

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 4 in |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 5.63 |
| Depth to bottom (ft ~~bgs~~ TOC) | 89.45 |
| Screen Interval (ft-bgs) | 80-90 |
| Total volume purged (gal) | 8.0 |

**Sampling Type**

Purging Method: Peristaltic Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 1106 / 1208 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI ___ (11J102413), GEO Pump (Pine ID R19241 ___, Solinist H2O Meter (18174 ___),

Lamotte 2020we (3597-3513)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1136 | 870 | 6.40 | 7.07 | 7.20 | 0.591 | 1.31 | -6.8 | 3.91 | Clear |
| 1141 | 450 | 6.15 | 7.26 | 7.20 | 0.591 | 1.23 | -10.9 | 3.28 | Clear |
| 1146 | 300 | 5.92 | 7.34 | 7.20 | 0.590 | 1.19 | -10.5 | 2.97 | Clear |
| 1151 | 200 | 5.81 | 7.55 | 7.20 | 0.589 | 1.12 | -12.1 | 3.19 | Clear |
| 1156 | 150 | 5.81 | 7.79 | 7.21 | 0.588 | 1.03 | -14.1 | 2.67 | Clear |
| 1201 | 150 | 5.81 | 7.85 | 7.21 | 0.590 | 0.98 | -13.5 | 2.93 | Clear |
| 1206 | 150 | 5.81 | 7.67 | 7.21 | 0.588 | 0.98 | -12.6 | 3.05 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHM-96-5B_SPS17

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45 um Dup ID/Time: NA

Sample Time: 1208

Comments Dedicated Tubing, Purged for 30 mins before readings Sampled @ 1208

Signature 5/31/17 Date

LNM

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA - PZ - 2012-5B_SPS17

| | | | |
|---|---|---|---|
| Project: | 1024-003 Shepleys Spring 2017 | Date: | 5/31/17 |
| Location: | Fort Devens Massachusetts | Sampler: | Ian Valentine |

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1 in |
| Material | PVC |
| Depth to water (ft-~~bgs~~ toc) | 6.33 |
| Depth to bottom (ft ~~bgs~~ toc) | 85.42 |
| Screen Interval (ft-bgs) | 80 - 85 |
| Total volume purged (gal) | 5.0 |

**Sampling Type**

Purging Method: Peristaltic Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 1328 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI 556MPS (15J102412), GEO Pump (Pine ID R19241, Solinist H2O Meter (18179), Lamotte 2020we (3597-5513)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1338 | 757 | 6.71 | 7.14 | 8.05 | 0.539 | 3.46 | 105.7 | 5.98 | Clear |
| 1343 | 425 | 6.61 | 7.42 | 7.61 | 0.539 | 1.58 | 107.2 | 9.64 | Clear |
| 1348 | 280 | 6.50 | 7.56 | 7.38 | 0.538 | 1.39 | 106.4 | 8.73 | Clear |
| 1353 | 225 | 6.45 | 7.97 | 7.23 | 0.536 | 1.09 | 105.9 | 8.78 | Clear |
| 1358 | 225 | 6.45 | 7.73 | 7.16 | 0.538 | 1.08 | 105.5 | 8.95 | Clear |
| 1403 | 225 | 6.45 | 7.71 | 7.09 | 0.537 | 1.11 | 107.1 | 7.92 | Clear |
| 1408 | 225 | 6.45 | 7.74 | 7.05 | 0.537 | 0.96 | 107.2 | 5.47 | Clear |
| 1413 | 225 | 6.45 | 7.75 | 7.03 | 0.536 | 0.96 | 108.1 | 6.46 | Clear |
| 1418 | 225 | 6.45 | 7.76 | 7.00 | 0.534 | 0.90 | 108.9 | 3.14 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

EPA - PZ - 2012 - 5B_SPS17

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: 0.45 um Dup ID/Time: N

Sample Time: 1425

Comments: Would not flow less than 225 mL/min ; Turbidity under 5

Signature

6/1/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-P2-2012-5A

Project: 1024-003 Shepleys Spring 2017 Date: 5/31/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 6.86 |
| Depth to bottom (ft ~~bgs~~ TOC) | 27.44 |
| Screen Interval (ft-~~bgs~~ BGS) | 20-25 BGS |
| Total volume purged (gal) | 3.50 |

**Sampling Type**

Purging Method: Low flow Peristaltic Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 1315 / 1330 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1330 | 350 | 7.00 | 9.80 | 5.35 | 0.134 | 0.46 | 40.3 | 20.27 | Clear |
| 1335 | 175 | 7.01 | 10.41 | 5.54 | 0.134 | 0.53 | 26.9 | 14.22 | Clear |
| 1340 | 175 | 6.99 | 10.35 | 5.53 | 0.134 | 0.61 | 26.2 | 13.14 | Clear |
| 1345 | 150 | 6.99 | 10.52 | 5.51 | 0.133 | 0.57 | 26.0 | 11.73 | Clear |
| 1350 | 150 | 6.99 | 10.45 | 5.49 | 0.133 | 0.55 | 26.1 | 9.31 | Clear |
| 1355 | 150 | 6.99 | 10.48 | 5.47 | 0.133 | 0.49 | 26.0 | 9.37 | Clear |
| 1400 | 150 | 6.99 | 10.49 | 5.45 | 0.133 | 0.48 | 25.9 | 9.13 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

EPA-P2-2012-5A-SPR17

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45 um Dup ID/Time: —

Sample Time: 1402

Comments Replaced dedicated tubing

LM

Signature

5/31/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-07-05X

Project: 1024-003 Shepleys Spring 2017
Location: Fort Devens Massachusetts

Date: 6/1/17
Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | |
| Locked (stickup wells) | | | X |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Asphalt Depth to water (ft-~~bgs~~ TOC) | 13.51 |
| Depth to bottom (ft ~~bgs~~ TOC) | 64.75 |
| Screen Interval (ft-bgs) | 56-66 |
| Total volume purged (gal) | 7.25 |

**Sampling Type**

Purging Method: Low Flow Bladder
Purge start/stop time: 12:29/1251
Tubing type: Double Bounded
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: Nitrogen
Field Instrument (Model/S/N): YSI650MDS(001-1207 AD)

QED MP10(MP10-2482), SamplePro Bladder Pump(27107), Solinist H2O Meter(212202), Lamotte 2020we(3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1251 | 225 | 36.79 | 12.49 | 7.24 | 3.907 | 1.65 | -27.5 | 273 | Cloudy |
| 1256 | 175 | 37.85 | 12.60 | 7.24 | 3.900 | 1.63 | -31.1 | 142 | Cloudy |
| 1301 | 175 | 39.30 | 13.04 | 7.22 | 3.882 | 1.61 | -30.0 | 130 | Cloudy |
| 1306 | 175 | 41.83 | 12.94 | 7.18 | 3.857 | 1.53 | -31.0 | 51.67 | Cloudy |
| 1311 | 175 | 42.35 | 13.00 | 7.16 | 3.849 | 1.52 | -31.2 | 37.12 | cloudy |
| 1316 | 150 | 43.39 | 13.59 | 7.15 | 3.841 | 1.51 | -31.2 | 31.23 | cloud |
| 1321 | 150 | 44.76 | 13.65 | 7.12 | 3.814 | 1.49 | -31.9 | 28.00 | cloudy/clear |
| * 1326 | 150 | 45.76 | 14.57 | 7.13 | 3.799 | 1.44 | -35.2 | 25 | cloudy/clear |
| 1331 | 75 | 46.74 | 15.53 | 7.14 | 3.796 | 1.49 | -42.1 | 21 | cloudy/clear |
| 1336 | 75 | 46.74 | 14.72 | 7.17 | 3.800 | 1.48 | -45.6 | 22 | Cloudy clear |
| 1341 | 75 | 46.74 | 14.68 | 7.18 | 3.800 | 1.47 | -45.8 | 21 | Cloudy clear |
| 1346 | 75 | 46.74 | 14.70 | 7.19 | 3.798 | 1.46 | -49.9 | 20 | Cloudy clear |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHM-07-05X
Field Filtered (Y/N): Y
Filter Size: .45µm
Sample time 1348
Duplicate (Y/N): N
Dup ID/Time:
MS/MSD (Y/N): N

**Comments** Alot of silt present, * changed Air fan at 1325 LM

Melissa A Miller
**Signature**

6/1/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-07-03

Project: 1024-003 Shepleys Spring 2017 | Date: 6/1/17

Location: Fort Devens Massachusetts | Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | | X | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | |
| Locked (stickup wells) | | | X |

- Partial Damage

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ toc) | 18.83 |
| Depth to bottom (ft ~~bgs~~ toc) | 33.35 |
| Screen Interval (ft-bgs) | 25-35 |
| Total volume purged (gal) | 4.75 |

**Sampling Type** Low Flow

Purging Method: Peristaltic | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 925/940 | Tubing diameter: 1/4" | Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0940 | 450 | 20.65 | 11.59 | 6.08 | 0.776 | 7.95 | 99.9 | 65.14 | cloudy/clear |
| 0945 | 200 | 20.78 | 12.14 | 5.99 | 0.771 | 7.35 | 83.6 | 43.00 | cloudy/clear |
| 0950 | 200 | 19.67 | 12.41 | 5.91 | 0.773 | 7.45 | 75.0 | 28.90 | cloudy/clear |
| 0955 | 200 | 19.67 | 12.47 | 5.85 | 0.775 | 7.50 | 75.1 | 22.42 | clear |
| 1000 | 175 | 19.63 | 12.56 | 5.80 | 0.779 | 7.42 | 75.2 | 18.73 | clear |
| 1005 | 150 | 19.53 | 12.71 | 5.77 | 0.782 | 7.49 | 75.2 | 15.27 | clear |
| 1010 | 150 | 19.53 | 12.59 | 5.75 | 0.783 | 7.46 | 75.5 | 13.20 | clear |
| 1015 | 150 | 19.53 | 12.62 | 5.74 | 0.784 | 7.40 | 75.9 | 9.89 | clear |
| 1020 | 150 | 19.53 | 12.65 | 5.73 | 0.785 | 7.41 | 76.0 | 9.85 | clear |
| 1025 | 150 | 19.53 | 12.63 | 5.70 | 0.786 | 7.40 | 76.5 | 9.81 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHM-07-03_SPR17

Field Filtered (Y/N): Y | Duplicate (Y/N): Y | MS/MSD (Y/N): N

Filter Size: 45µm | Dup ID/Time: SHL-DUP06-SPR_17 @1032

Sample Time: 1027

Comments ☆ Field Duplicate, Dedicated tubing

LHM

Signature

6/1/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-10_SPR17

Project: 1024-003 Shepleys Spring 2017 | Date: 6/1/17

Location: Fort Devens Massachusetts | Sampler: Ian Valentino

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 2in |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 37.50 |
| Depth to bottom (ft ~~bgs~~ TOC) | 38.57 |
| Screen Interval (ft-bgs) | 24-39 |
| Total volume purged (gal) | 3.0 |

**Sampling Type**

Purging Method: Peristaltic | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 1202 | Tubing diameter: 1/4" | Air source: NA

Field Instrument (Model/S/N): YSI 556 (16102413), GEO Pump (Pine ID 21855, Solinist H2O Meter (18174),

Lamotte 2020we (3397-7513)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1212 | 700 | 30.61 | 10.30 | 6.61 | 0.021 | 13.68 | 216.0 | 17.4 | Clear/Cloudy |
| 1217 | 210 | 30.61 | 10.18 | 6.47 | 0.021 | 13.51 | 209.7 | 12.1 | Clear/Cloudy |
| 1222 | 175 | 30.61 | 10.09 | 6.31 | 0.021 | 13.56 | 207.8 | 11.90 | Clear/Cloudy |
| 1227 | 175 | 30.61 | 9.48 | 6.28 | 0.021 | 13.88 | 204.9 | 11.99 | Clear/Cloudy |
| 1232 | 175 | 30.61 | 9.85 | 6.06 | 0.022 | 13.48 | 210.9 | 10.56 | Clear/Cloudy |
| 1237 | 175 | 30.61 | 9.22 | 6.15 | 0.022 | 13.49 | 206.3 | 10.15 | Clear/Cloudy |
| 1242 | 175 | 30.61 | 9.58 | 6.09 | 0.022 | 13.40 | 202.4 | 9.75 | Clear |
| 1247 | 175 | 30.61 | 9.24 | 6.18 | 0.022 | 13.50 | 199.7 | 9.42 | Clear |
| 1252 | 175 | 30.61 | 9.19 | 6.07 | 0.022 | 13.36 | 204.1 | 9.26 | Clear |
| 1257 | 175 | 30.61 | 9.46 | 6.44 | 0.022 | 9.07 | 182.0 | 9.06 | Clear |
| 1302 | 175 | 30.61 | 9.50 | 6.51 | 0.022 | 9.15 | 180.3 | 8.70 | Clear |
| 1307 | 175 | 30.61 | 9.52 | 6.53 | 0.022 | 9.14 | 184.2 | 8.67 | Clear |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHL-10_SPR17

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): Y

Filter Size: 0.45µ | Dup ID/Time: N

Sample Time: 1310

**Comments** Pump dried

Signature

6/1/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL PZ-2012-07

Project: SHL

Location: Fort Devens Massachusetts

Date: 6/2/17

Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 27.31 |
| Depth to bottom (ft ~~bgs~~ TOC) | 32.56 |
| Screen Interval (ft-~~bgs~~) | (18-28) bgs |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech

Purge start/stop time: 905

Tubing type: Poly

Tubing diameter: 1/4"

Dedicated pump (Y/N): N

Air source: N/A

Field Instrument (Model/S/N): YSI 556 MPS 07610[illegible] LaMotte

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 905 | 200 | 27.47 | 11.13 | 5.11 | 181 | 2.68 | -1.9 | 38.4 | Clear |
| 910 | ↓ | 27.47 | 11.15 | 5.73 | 167 | 2.89 | -3.1 | 35.1 | ↓ |
| 915 | ↓ | 27.47 | 11.00 | 5.97 | 164 | 3.07 | -32.6 | 36.7 | ↓ |
| 920 | ↓ | 27.47 | 11.01 | 5.92 | 143 | 3.89 | -6.7 | 26.1 | ↓ |
| 925 | ↓ | 27.47 | 11.00 | 5.92 | 113 | 4.45 | 8.7 | 13.7 | ↓ |
| 930 | ↓ | 27.47 | 11.07 | 5.91 | 110 | 4.52 | 12.6 | 8.99 | ↓ |
| 935 | ↓ | 27.47 | 11.06 | 5.90 | 109 | 4.61 | 13.3 | 8.90 | ↓ |
| 940 | ↓ | 27.47 | 11.08 | 5.93 | 109 | 4.64 | 14.6 | 8.86 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y

Filter Size: .45

Duplicate (Y/N): N

Dup ID/Time: N/A

MS/MSD (Y/N): N

**Comments** PZ-2012-07-SPR17 @ 945

[illegible]

**Signature**

6/2/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** PZ-2012-08

Project: SML
Location: Fort Devens Massachusetts
Date: 6/2/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ toc) | 24.75 |
| Depth to bottom (ft-~~bgs~~ toc) | 31.64 |
| Screen Interval (ft-~~bgs~~) | 18.28 BGS |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1020
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 07 [illegible] 00122 LaMotte 2020WE A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1020 | 200 | 24.68 | 9.56 | 7.23 | 47 | 8.86 | 121.7 | 17.3 | clear |
| 1025 | ↓ | 24.68 | 10.40 | 7.40 | 42 | 8.91 | 79.6 | 14.1 | ↓ |
| 1030 | ↓ | 24.68 | 10.39 | 7.39 | 40 | 9.16 | 44.8 | 16.5 | ↓ |
| 1035 | ↓ | 24.68 | 10.37 | 7.37 | 40 | 8.67 | 27.3 | 15.2 | ↓ |
| 1040 | ↓ | 24.68 | 10.36 | 7.39 | 40 | 8.64 | 24.9 | 15.0 | ↓ |
| 1045 | ↓ | 24.68 | 10.36 | 7.38 | 39 | 8.60 | 23.9 | 14.8 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** PZ-2012-08-SPR17 @ 1050 (LTM)

[signature]
**Signature**

6/2/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-19

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/2/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ toc) | 23.13 |
| Depth to bottom (ft ~~bgs~~ toc) | 32.28 |
| Screen Interval (ft-~~bgs~~) | 20-30 bgs |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1145
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): ~~N~~ Y Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 4PS 07 B1 00122 Lamotte 2020WE A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1145 | 200 | 23.09 | 10.30 | 5.43 | 32 | 10.01 | 124.4 | 12.34 | clear |
| 1150 | ↓ | 23.09 | 10.21 | 5.67 | 32 | 9.90 | 120.4 | 11.14 | ↓ |
| 1155 | ↓ | 23.09 | 10.15 | 5.70 | 31 | 9.87 | 119.6 | 11.02 | ↓ |
| 1200 | ↓ | 23.09 | 10.14 | 5.73 | 31 | 9.86 | 118.7 | 11.01 | ↓ |
| 1205 | ↓ | 23.09 | 10.16 | 5.72 | 30 | 9.83 | 117.9 | 11.03 | ↓ |
| | | | | | | | | | |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SHL-19 - SPR17 @ 1210 (LTM)

[signature]
**Signature**

6/2/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-01-36X

Project: 1024-003 Shepleys Spring 2017 Date: 6/2/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | | | X |
| Metal ~~PVC~~ casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | | X |
| Locked (stickup wells) | | X | |

*needs Lock

**Well Information**

| | | |
|---|---|---|
| Diameter | 1" | |
| Material | Metal | |
| Depth to water (ft-bgs) TMP | 7.35 | toc |
| Depth to bottom (ft bgs) TMP | 9.82 | toc |
| Screen Interval (ft-bgs) | 3-8 ft | |
| Total volume purged (gal) | 3.0 | |

**Sampling Type** Low flow

Purging Method: Peristaltic Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 850/910 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0810 | 350 | 7.41 | 14.26 | 6.83 | 0.382 | 0.57 | 32.3 | 21.27 | Clear |
| 0915 | 225 | 7.41 | 14.42 | 6.72 | 0.384 | 0.73 | 32.0 | 16.46 | Clear |
| 0920 | 225 | 7.40 | 14.46 | 6.67 | 0.384 | 0.68 | 31.4 | 8.91 | Clear |
| 0925 | 225 | 7.41 | 14.51 | 6.60 | 0.382 | 0.65 | 31.0 | 6.64 | Clear |
| 0930 | 225 | 7.41 | 14.49 | 6.59 | 0.382 | 0.62 | 31.5 | 6.70 | Clear |
| 0935 | 225 | 7.41 | 14.47 | 6.57 | 0.382 | 0.60 | 32.3 | 6.73 | Clear |
| 0940 | 225 | 7.41 | 14.45 | 6.55 | 0.382 | 0.59 | 32.9 | 6.69 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHP-01-36X-SPR17

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45 µm Dup ID/Time: —

Sample Time: 0942

Comments Has Dedicated tubing. LAM

Melissa A Miller

Signature

6/2/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-01-37X

Project: 1024-003 Shepleys Spring 2017 | Date: 6/2/17

Location: Fort Devens Massachusetts | Sampler: Jon Valentino

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | ~~X~~ | X |
| Metal/~~PVC~~ casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | |
| Locked (stickup wells) | | | X |

**Well Information**

| | | |
|---|---|---|
| Diameter | 1" | |
| Material | MPVC | |
| Depth to water (ft-~~bgs~~ TOC) | 6.15 | TOC |
| Depth to bottom (ft-~~bgs~~) | 8.16 | TOC |
| Screen Interval (ft-bgs) | 1-6 | |
| Total volume purged (gal) | 4 | |

**Sampling Type** Low flow

Purging Method: ~~Peristaltic~~ | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 955/1005 1023/1033 | Tubing diameter: 1/4" | Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1005 | | 6.32 | 11.81 | 6.44 | 0.484 | 0.60 | 27.1 | 7.64 | clear |
| 1010 | 175 | 6.22 | 12.73 | 6.59 | 0.485 | 0.81 | 18.6 | 7.28 | clear |
| ~~1015~~ | | | | | | | | | |
| ~~1020~~ | | | | | | | | | |
| 1033 | 300 | 6.24 | 12.37 | 6.60 | 0.477 | 0.91 | 16.0 | 8.65 | clear |
| 1038 | 175 | 6.24 | 12.93 | 6.68 | 0.475 | 1.01 | 12.3 | | |
| 1123 | 250 | 6.25 | 12.27 | 6.50 | 0.475 | 0.90 | 22.4 | 9.49 | clear |
| 1128 | 250 | 6.25 | 12.39 | 6.54 | 0.471 | 1.05 | 19.9 | 8.40 | clear |
| 1133 | 250 | 6.25 | 12.31 | 6.61 | 0.470 | 1.12 | 15.9 | 8.54 | clear |
| 1138 | 250 | 6.25 | 12.56 | 6.64 | 0.470 | 1.15 | 13.6 | 8.32 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHP-01-37x - SPR17

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): N

Filter Size: .45 µm | Dup ID/Time:

Sample Time: 1143

Comments Battery died, began purging @ 1023 Has dedicated tubing LTM

Signature | Date 6/2/17

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-10-16

Project: 1024-003 Shepleys Spring 2017 | Date: 6-2-17

Location: Fort Devens Massachusetts | Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 1.5" | |
| Material | PVC | |
| Depth to water (ft-bgs) | 18.54 | TOC |
| Depth to bottom (ft-bgs) | 81.38 | TOC |
| Screen Interval (ft-bgs) | 75-85 | |
| Total volume purged (gal) | 3.50 | |

**Sampling Type**

Purging Method: Peristaltic Low Flow | Tubing type: LDPE | Dedicated pump (Y/N): N

Purge start/stop time: 1255/1310 | Tubing diameter: 1/4" / 1/2" | Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1310 | 275 | 18.36 | 10.95 | 6.82 | 0.702 | 7.04 | -70.0 | 6.52 | Clear |
| 1315 | 275 | 18.36 | 10.84 | 6.76 | 0.704 | 6.72 | -66.7 | 6.29 | Clear |
| 1320 | 250 | 18.39 | 10.80 | 6.76 | 0.705 | 6.69 | -66.5 | 6.30 | Clear |
| 1325 | 250 | 18.39 | 10.85 | 6.76 | 0.704 | 6.67 | -68.1 | 6.32 | Clear |
| 1330 | 250 | 18.39 | 10.87 | 6.77 | 0.704 | 6.65 | -68.0 | 6.36 | Clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHM-10-16_SPR17

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): N

Filter Size: 0.45um | Dup ID/Time:

Sample Time: 1330

Comments: Dedicated tubing

LAM

Melissa A Miller

Signature

6/2/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-13-08

Project: 1024-003 Shepleys Spring 2017 Date: 6/6/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | X | | |
| Locked (stickup wells) | | X | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft-~~bgs~~ TOC) | 19.69 |
| Depth to bottom (ft ~~bgs~~ TOC) | 64.41 |
| Screen Interval (ft-bgs) | 55-65 |
| Total volume purged (gal) | 3.75 |

**Sampling Type** Low flow peristaltic

Purging Method: Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 1410/1420 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1420 | 450 | 19.73 | 11.01 | 6.49 | 0.567 | 0.52 | -58.7 | 21.14 | cloudy/clear |
| 1425 | 200 | 19.71 | 10.80 | 6.65 | 0.575 | 0.53 | -54.1 | 14.54 | clear |
| 1430 | 200 | 19.70 | 10.95 | 6.70 | 0.575 | 0.56 | -51.7 | 14.8 | clear |
| 1435 | 200 | 19.73 | 10.91 | 6.72 | 0.709 | 0.45 | -45.2 | 13.31 | clear |
| 1440 | 200 | 19.73 | 10.73 | 6.68 | 0.956 | 0.35 | -53.1 | 13.18 | clear |
| 1445 | 200 | 19.73 | 10.74 | 6.69 | 0.994 | 0.37 | -49.1 | 11.72 | clear |
| 1450 | 200 | 19.73 | 10.75 | 6.71 | 1.083 | 0.38 | -47.9 | 9.92 | clear |
| 1455 | 200 | 19.73 | 10.74 | 6.74 | 1.085 | 0.36 | -43.7 | 8.91 | clear |
| 1500 | 200 | 19.72 | 10.75 | 6.73 | 1.084 | 0.37 | -45.9 | 9.89 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

SHM-13-08_SPR17

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45 um Dup ID/Time:

Sample Time: 1502

Comments Dedicated tubing

LTM

Melissa Miller

Signature

6/6/17

Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-11-06

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/6/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 17.81 | TOC |
| Depth to bottom (ft-~~bgs~~) | 35.48 | TOC |
| Screen Interval (ft-~~bgs~~) | 25-35 | BGS |
| Total volume purged (gal) | 3.0 | |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 940
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): ~~X~~ Fixing
Air source: N/A
Field Instrument (Model/S/N): YSI 65 MPS 07 61 00122
LaMotte Turbidity A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 940 | 200 | 19.45 | 8.92 | 6.68 | 417 | 0.88 | -24.8 | 11.85 | clear |
| 945 | ↓ | 19.45 | 8.67 | 6.29 | 417 | 0.63 | -32.7 | 10.03 | ↓ |
| 950 | ↓ | 19.45 | 8.63 | 6.11 | 417 | 0.33 | -55.1 | 8.97 | ↓ |
| 955 | ↓ | 19.45 | 8.79 | 6.11 | 415 | 0.32 | -57.3 | 8.94 | ↓ |
| 1000 | ↓ | 19.45 | 8.64 | 6.12 | 415 | 0.31 | -59.9 | 8.90 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 145
Duplicate (Y/N): Y
Dup ID/Time: SHL-DUP-3-SPR17 @ 1010
MS/MSD (Y/N): N

**Comments** SHM-11-06-SPR17 @ 1005 (LTM)
(1) 250ml Liner Inc. Bottle collected

[signature]
**Signature**

6/6/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-05-41B_SPR17

Project: 1024-003 Shepleys Spring 2017 Date: 6/6/17

Location: Fort Devens Massachusetts Sampler: IV

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | X | | |
| Locked (stickup wells) | | | X |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2in | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 9.70 | TOC |
| Depth to bottom (ft ~~bgs~~) | 69.90 | TOC |
| Screen Interval (ft-bgs) | 62-67 | |
| Total volume purged (gal) | 3.94 | |

**Sampling Type**

Purging Method: Peristaltic Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 1123 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI 556 (11302418), GEO Pump (Pine ID 11870, Solinist H2O Meter (18174),

Lamotte 2020we (3597-3513)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1133 | 800 | 9.75 | 6.59 | 7.28 | 0.482 | 1.43 | -46.2 | 9.12 | clear |
| 1138 | 400 | 9.73 | 6.56 | 7.20 | 0.481 | 1.18 | -48.4 | 10.73 | clear |
| 1143 | 200 | 9.73 | 6.58 | 7.14 | 0.480 | 2.26 | -47.1 | 10.67 | clear |
| 1148 | 150 | 9.71 | 6.58 | 7.12 | 0.480 | 1.83 | -48.8 | 9.32 | clear |
| 1153 | 156 | 9.71 | 6.60 | 7.13 | 0.480 | 1.80 | -50.4 | 8.64 | clear |
| 1158 | 150 | 9.71 | 6.58 | 7.12 | 0.479 | 1.73 | -50.9 | 9.06 | clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: 0.45 Dup ID/Time: NA

Sample Time: 1203

omments raining

Signature

6/6/17

Date

LTM

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-05-41C-SP017

Project: 1024-003 Shepleys Spring 2017
Location: Fort Devens Massachusetts

Date: 6/6/17
Sampler: Jon Valentino

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | X | | |
| Locked (stickup wells) | | | X |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 10.85 | TOC |
| Depth to bottom (ft-~~bgs~~) | 88.77 | TOC |
| Screen Interval (ft-bgs) | 88-93 | |
| Total volume purged (gal) | 5 | |

**Sampling Type**

Purging Method: Peristaltic
Purge start/stop time: 1241
Tubing type: LDPE
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: NA

Field Instrument (Model/S/N): YSI 556 (11J024113), GEO Pump (Pine ID 1870), Solinist H2O Meter (18174), Lamotte 2020we (3597-3513)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1251 | 225 | 11.00 | 6.77 | 7.45 | 1.064 | 0.93 | -74.4 | 5.96 | clear |
| 1256 | 225 | 10.99 | 6.86 | 7.43 | 1.030 | 0.87 | -81.9 | 5.57 | clear |
| 1301 | 175 | 10.95 | 6.85 | 7.44 | 1.026 | 0.80 | -82.8 | 6.77 | clear |
| 1306 | 175 | 10.91 | 6.82 | 7.44 | 1.069 | 0.82 | -81.4 | 6.39 | clear |
| 1311 | 175 | 10.91 | 6.80 | 7.42 | 1.091 | 0.94 | -74.0 | 7.40 | clear |
| 1316 | 175 | 10.91 | 6.77 | 7.42 | 1.106 | 0.94 | -71.4 | 11.4 | clear |
| 1321 | 175 | 10.91 | 6.75 | 7.42 | 1.112 | 0.94 | -69.9 | 9.78 | clear |
| 1326 | 175 | 10.91 | 6.76 | 7.41 | 1.120 | 0.94 | -69.3 | 9.19 | clear |
| 1331 | 175 | 10.91 | 6.80 | 7.42 | 1.125 | 0.87 | -71.4 | 8.56 | clear |
| 1336 | 175 | 10.91 | 6.73 | 7.43 | 1.130 | 0.90 | -76.7 | 8.42 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Sample Time: 1338
Duplicate (Y/N): N
Dup ID/Time: NA
MS/MSD (Y/N): N

Comments Rainy

Signature

6/6/17
Date

LTM

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHM-13-03_Spr17

Project: 1024-003 Shepleys Spring 2017
Location: Fort Devens Massachusetts

Date: 6/6/17
Sampler: Ian Valentino

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2in | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 4.50 | TOC |
| Depth to bottom (ft ~~bgs~~) | 51.90 | TOC |
| Screen Interval (ft-bgs) | 42-52 | |
| Total volume purged (gal) | 3 gal | |

**Sampling Type**

Purging Method: Peristaltic
Tubing type: LDPE
Dedicated pump (Y/N): N
Purge start/stop time: 1441/1521
Tubing diameter: 1/4"
Air source: NA

Field Instrument (Model/S/N): YSI551 (11J02413), GEO Pump (Pine ID 11870, Solinist H2O Meter (18174), Lamotte 2020we (3597-3513)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1451 | 225 | 4.85 | 8.28 | 6.98 | 0.637 | 0.76 | 19.2 | 4.67 | clear |
| 1456 | 225 | 4.81 | 8.13 | 6.99 | 0.650 | 0.87 | -68.7 | 3.13 | clear |
| 1501 | 190 | 4.81 | 8.08 | 7.03 | 0.653 | 0.75 | -62.4 | 4.22 | clear |
| 1506 | 190 | 4.81 | 8.08 | 7.02 | 0.655 | 0.69 | -61.5 | 5.01 | clear |
| 1511 | 190 | 4.81 | 8.07 | 7.01 | 0.657 | 0.66 | -62.2 | 4.94 | clear |
| 1516 | 190 | 4.81 | 8.10 | 7.00 | 0.658 | 0.66 | -58.6 | 4.80 | clear |
| 1521 | 190 | 4.81 | 8.10 | 7.00 | 0.661 | 0.63 | -65.6 | 4.74 | clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Duplicate (Y/N): N
MS/MSD (Y/N): Y
Filter Size: 0.45
Dup ID/Time: N
Sample Time: 1534

Comments

LTM

Signature

6/6/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** PZ-12-9

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/7/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 23.64 | TOC |
| Depth to bottom (ft ~~bgs~~) | 32.64 | TOC |
| Screen Interval (ft-~~bgs~~) | 22-32 | BGS |
| Total volume purged (gal) | 4.0 | |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 840
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 07 G 100122 LaMotte 2020VE A02735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 840 | 200 | 23.38 | 10.61 | 6.73 | 167 | 0.94 | 70.7 | 10.51 | Clear |
| 845 | | 23.38 | 10.59 | 6.60 | 169 | 1.39 | 69.1 | 8.19 | |
| 850 | | 23.38 | 10.63 | 6.54 | 173 | 1.95 | 66.1 | 7.89 | |
| 855 | | 23.38 | 10.49 | 6.53 | 174 | 2.67 | 65.4 | 7.23 | |
| 900 | | 23.38 | 10.44 | 6.51 | 175 | 2.94 | 64.5 | 6.91 | |
| 905 | | 23.38 | 10.47 | 6.51 | 175 | 2.97 | 63.1 | 6.87 | |
| 910 | | 23.38 | 10.48 | 6.53 | 177 | 3.02 | 63.0 | 6.88 | |
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** PZ-12-9-SPR17 @ 915 (LTM)

[signature]
**Signature**

6/7/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** PZ-12-10

Project: SAG
Location: Fort Devens Massachusetts
Date: 6/7/17
Sampler: KKA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2" | |
| Material | PVC | |
| Depth to water (ft-bgs) | 21.68 | TOC |
| Depth to bottom (ft bgs) | 36.79 | TOC |
| Screen Interval (ft-bgs) | 22-32 | BGS |
| Total volume purged (gal) | 3.0 | |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 950
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI EXO 1122 07610 LaMotte 2020WQ

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 950 | 200 | 21.17 | 9.79 | 5.96 | 50 | 10.25 | 118.3 | 8.10 | Clear |
| 955 | ↓ | 21.17 | 9.40 | 5.67 | 47 | 9.87 | 127.3 | 7.21 | ↓ |
| 1000 | ↓ | 21.17 | 9.34 | 5.67 | 46 | 9.74 | 129.7 | 6.59 | ↓ |
| 1005 | ↓ | 21.17 | 9.39 | 5.66 | 46 | 9.69 | 130.1 | 6.49 | ↓ |
| 1010 | ↓ | 21.17 | 9.47 | 5.67 | 46 | 9.67 | 131.6 | 6.50 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** PZ-12-10-SR17 @ 1015 (LTM)

Signature: [signature]
Date: 6/7/17

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-13-07

Project: FHL

Location: Fort Devens Massachusetts

Date: 6/7/17

Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 18.19 | TOC |
| Depth to bottom (ft ~~bgs~~) | 35.23 | TOC |
| Screen Interval (ft-~~bgs~~) | 27 - 37 | BGS |
| Total volume purged (gal) | 4.0 | |

**Sampling Type**

Purging Method: peristaltic

Purge start/stop time: 1055

Tubing type: Poly

Tubing diameter: 1/4"

Dedicated pump (Y/N): Tubing

Air source: N/A

Field Instrument (Model/S/N): YSI 556 MPS

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1055 | 200 | 18.07 | 11.09 | 6.22 | 2.63 | 0.63 | 112.0 | 38.2 | Clear |
| 1100 | | 18.07 | 11.06 | 6.20 | 2.66 | 0.49 | 97.3 | 27.9 | |
| 1105 | | 18.07 | 11.02 | 6.19 | 2.65 | 0.39 | 78.6 | 26.1 | |
| 1110 | | 18.07 | 11.14 | 6.25 | 2.66 | 0.24 | 34.3 | 23.9 | |
| 1115 | | 18.07 | 11.15 | 6.26 | 2.65 | 0.21 | 3.6 | 21.3 | |
| 1120 | | 18.07 | 11.30 | 6.27 | 2.65 | 0.20 | -0.4 | 19.2 | |
| 1125 | | 18.07 | 11.40 | 6.29 | 2.66 | 0.20 | -12.5 | 19.3 | |
| 1130 | | 18.07 | 11.47 | 6.29 | 2.67 | 0.21 | -14.7 | 19.3 | |
| 1135 | ↓ | 18.07 | 11.48 | 6.30 | 2.67 | 0.22 | -15.3 | 19.2 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Acceptance Criteria: <0.3ft ±3% ±0.1 ±3% ±10% ± 10mv 10%

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y

Filter Size: 1.45

Duplicate (Y/N): N

Dup ID/Time: N/A

MS/MSD (Y/N): N

**Comments** SHM-13-07-SPRT @ 1140 (LTM)

[illegible]

**Signature**

6/7/17

**Date**

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-4

Project: SHL
Location: Fort Devens Massachusetts
Date: 6/7/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 2" | |
| Material | PVC | |
| Depth to water (ft-~~bgs~~) | 10.51 | TOC |
| Depth to bottom (ft ~~bgs~~) | 14.53 | TOC |
| Screen Interval (ft-~~bgs~~) | 3-13 | BGS |
| Total volume purged (gal) | 3.0 | |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1300
Tubing type: PoM
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 07K 100 [illegible]
LaMotte 2020WP A07735

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1300 | 200 | 10.17 | 10.44 | 6.02 | 159 | 0.45 | -12.9 | 19.0 | Clear |
| 1305 | ↓ | 10.17 | 10.30 | 6.01 | 153 | 0.43 | -10.6 | 14.0 | ↓ |
| 1310 | ↓ | 10.17 | 10.22 | 6.00 | 151 | 0.40 | -9.3 | 12.6 | ↓ |
| 1315 | ↓ | 10.17 | 10.21 | 6.00 | 150 | 0.41 | -8.7 | 12.3 | ↓ |
| 1320 | ↓ | 10.17 | 10.31 | 5.99 | 149 | 0.42 | -8.2 | 12.1 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

**Comments** SHL-4 ~SPR17 @ 1325 (LTM)

[signature]
**Signature**

6/7/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**

Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHP-01-38A

Project: 1024-003 Shepleys Spring 2017 Date: 6/12/17

Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| Metal PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | X | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | | |
|---|---|---|
| Diameter | 1" | |
| Material | metal | |
| Depth to water (ft-bgs) Tmeas | 3.85 | TOC |
| Depth to bottom (ft bgs) Tmeas | 6.82 | TOC |
| Screen Interval (ft-bgs) | 1.5 → 6.5 | |
| Total volume purged (gal) | 4.00 | |

-CAP

**Sampling Type**

Purging Method: Peristaltic Tubing type: LDPE Dedicated pump (Y/N): N

Purge start/stop time: 1005/1020 Tubing diameter: 1/4" Air source: NA

Field Instrument (Model/S/N): YSI650MDS (001-1207 AD), GEO Pump (Pine ID 21855), Solinist H2O Meter (212202), Lamotte 2020we (3450-2313)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (mS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1020 | 450 | 4.00 | 11.86 | 5.67 | 0.201 | 0.66 | -2.1 | 14.06 | Clear |
| 1025 | 300 | 3.90 | 13.03 | 5.74 | 0.202 | 0.71 | -15.9 | 13.62 | Clear |
| 1030 | 200 | 3.90 | 13.78 | 5.77 | 0.202 | 0.73 | -22.1 | 13.24 | Clear |
| 1035 | 200 | 3.90 | 13.68 | 5.78 | 0.204 | 0.75 | -22.8 | 12.43 | Clear |
| 1040 | 200 | 3.89 | 13.39 | 5.63 | 0.205 | 0.74 | -16.1 | 10.88 | Clear |
| 1045 | 200 | 3.89 | 13.62 | 5.45 | 0.205 | 0.69 | -10.2 | 10.53 | Clear |
| 1050 | 200 | 3.89 | 13.60 | 5.43 | 0.205 | 0.70 | -10.0 | 10.08 | Clear |
| 1055 | 200 | 3.89 | 13.62 | 5.37 | 0.204 | 0.70 | -7.6 | 9.92 | Clear |
| 1100 | 200 | 3.89 | 13.64 | 5.35 | 0.204 | 0.70 | -6.7 | 9.89 | Clear |
| 1105 | 200 | 3.89 | 13.65 | 5.34 | 0.205 | 0.70 | -4.2 | 9.84 | Clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHP-01-38A-SPR17

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N

Filter Size: .45 um Dup ID/Time:

Sample time: 1107

**Comments** Has dedicated tubing

Melissa A. Miller 6/12/17

**Signature** Date

LTM

KGS

# Field Instrument Calibration Log

**Project/Site Name:** 1024-003
**Calibrated By:** Melissa Miller

**Instrument:** YSI 650 MDS
**Serial Number:** 00L1207 AD

**Date:** 5/23/17
**Weather:** Sunny/Clear 48 – 66°F

| Parameters | Morning Calibration Time _____ | Cal. Temperature °C | Afternoon Calibration Time 1210 | Cal. Temperature °C |
|---|---|---|---|---|
| Conductivity (µS/cm$^c$) | — | — | 1.309 → 1.413 | 20.35 |
| pH (7) | — | — | 7.21 → 7.00 | 20.29 |
| pH (4) | — | — | 3.91 → 4.00 | 20.15 |
| pH (10) | — | — | 9.66 → 10.00 | 20.58 |
| ORP (mv) | — | — | 232.6 → 240.0 | 20.55 |
| Dissolved Oxygen (~~mg/L~~ %) | — | — | 101.9 → 100 | 20.57 |
| Barometric Pressure (mmHg) | — | — | — | — |
| | | | | |

**Notes:**

**Signature:** Melissa A Miller

**Date:** 5/23/17

KGS

# Field Instrument Calibration Log

**Project/Site Name:** 1024-003
**Calibrated By:** Melissa Miller

**Instrument:** YSI 650 MDS.
**Serial Number:** 00L1207 AD

**Date:** 5/24/17
**Weather:** overcast 57 – 66°F

| Parameters | Morning Calibration Time 815 | Cal. Temperature °C | Afternoon Calibration Time 1210 | Cal. Temperature °C |
|---|---|---|---|---|
| Conductivity (mS/cm) | 1.429 → 1.413 | 16.70 | 1.417 → 1.413 | 17.93 |
| pH (7) | 7.20 → 7.0 | 17.02 | 7.09 → 7.0 | 17.89 |
| pH (4) | 3.83 → 4.0 | 16.88 | 3.97 → 4.0 | 18.00 |
| pH (10) | 9.68 → 10.0 | 16.63 | 9.93 → 10.0 | 17.94 |
| ORP (mv) | 242.2 → 240.0 | 16.72 | 241.1 → 240.0 | 17.96 |
| Dissolved Oxygen (%/L) | 98.2 → 100 | 16.23 | 99.6 → 100 | 17.92 |
| Barometric Pressure (mmHg) | — | | | |
| | | | | |

**Notes:**

**Signature:** Melissa A Miller

**Date:** 5/24/17

KGS

# Field Instrument Calibration Log

**Project/Site Name:** Perus SHL
**Calibrated By:** [illegible]

**Instrument:** YSI 556MPS
**Serial Number:** 07610122

**Date:** 5/23, 5/24
**Weather:** 50's / 50's

| Parameters | Morning Calibration Time 5/23 | 5/24 | Cal. Temperature °C 5/23 | 5/24 | Afternoon Calibration Time 5/23 | 5/24 | Cal. Temperature °C 5/23 | 5/24 |
|---|---|---|---|---|---|---|---|---|
| Conductivity (µS/cm°) | 1.420 | 1.412 | 16.73 | 17.09 | 1.413 | 1.413 | 16.45 | 16.69 |
| pH (7) | 6.96 | 6.99 | | | 7.01 | 7.06 | | |
| pH (4) | 4.07 | 4.03 | | | 4.02 | 3.99 | | |
| pH (10) | 10.10 | 10.09 | | | 10.07 | 9.97 | | |
| ORP (mv) | 241.3 | 240.1 | | | 240.3 | 242.6 | | |
| Dissolved Oxygen (~~mg/L~~ %) | 100.1% | 102.6% | | | 99.7% | 97.6% | | |
| Barometric Pressure (mmHg) | – | – | | | – | | | |
| | | | | | | | | |

**Notes:**

**Signature:** [illegible]

**Date:** 5/24/17

KGS

# Field Instrument Calibration Log

**Project/Site Name:** 1024-003
**Calibrated By:** Melissa Miller

**Instrument:** YSI 650 MDS
**Serial Number:** 00L1207 AD

**Date:** 5/25/17
**Weather:** Overcast w/ scattered showers 54 → 56 °F

| Parameters | Morning Calibration Time 840 | Cal. Temperature °C | Afternoon Calibration Time 1250 | Cal. Temperature °C |
|---|---|---|---|---|
| Conductivity (µS/cm°) | 1.405 → 1.413 | 15.17 | 1.410 → 1.413 | 16.27 |
| pH (7) | 6.91 → 7.00 | 15.24 | 6.98 → 7.00 | 16.38 |
| pH (4) | 3.96 → 4.00 | 15.66 | 3.97 → 4.00 | 16.72 |
| pH (10) | 9.94 → 10.00 | 15.13 | 9.98 → 10.00 | 16.98 |
| ORP (mv) | 246.1 → 240.0 | 15.63 | 241.0 → 240.0 | 16.57 |
| Dissolved Oxygen (~~mg/L~~ %) | 99.2 → 100 | 15.22 | 99.8 → 100 | 16.32 |
| Barometric Pressure (mmHg) | — | — | — | — |
| | | | | |

**Notes:**

**Signature:** Melissa Miller

**Date:** 5/25/17

KGS

# Field Instrument Calibration Log

**Project/Site Name:** Davis SML
**Calibrated By:** [illegible]
**Instrument:** YSI 556 MPS
**Serial Number:** 07H100122
**Date:** 5/25
**Weather:** Cloudy

| Parameters | Morning Calibration Time 5/25 | Cal. Temperature °C | Afternoon Calibration Time 5/25 | Cal. Temperature °C |
|---|---|---|---|---|
| Conductivity (µS/cm°) | 1.413 | 16.47 | 1.412 | 14.90 |
| pH (7) | 6.93 | | 7.03 | |
| pH (4) | 4.02 | | 4.09 | |
| pH (10) | 10.07 | | 10.00 | |
| ORP (mv) | 241.6 | | 240.1 | |
| Dissolved Oxygen (~~mg/L~~ %) | 101.1% | | 97.6% | |
| Barometric Pressure (mmHg) | — | | | |
| | | | | |

**Notes:**

**Signature:** [illegible]

**Date:** 5/25/17

KGS

# Field Instrument Calibration Log

**Date:** 5/31/17 **Weather:** Overcast/Rain 74°F

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 650 MDS

**Calibrated By:** Melissa Miller **Serial Number:** 00L1207AP

| Parameters | Cal. Expiration Date | Morning Calibration Time 820 | Cal. Temperature °C | Afternoon Calibration Time 1230 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 10/17 | 1.412 → 1.413 | 14.98 | 1.411 → 1.413 | 16.71 |
| pH (7) | 10/18 | 7.06 → 7.00 | 14.81 | 7.02 → 7.00 | 16.62 |
| pH (4) | 10/18 | 3.98 → 4.00 | 14.96 | 4.01 → 4.00 | 16.81 |
| pH (10) | 10/17 | 9.46 → 10.00 | 15.05 | 9.87 → 10.00 | 16.92 |
| ORP (240 mv) | 06/21 | 239.1 → 240 | 14.99 | 238.9 → 240 | 16.13 |
| Dissolved Oxygen (%) | NA | 103.9 → 100 | 15.31 | 101.8 → 100 | 16.79 |
| Dissolved Oxygen (mg/L) | NA | 10.40 → 10.01 | 15.32 | 10.20 → 10.00 | 16.86 |
| Barometric Pressure (mmHg) | NA | — | — | — | — |

**Notes:**

**Signature:** Melissa Miller **Date:** 5/31/17

KGS

# Field Instrument Calibration Log

**Date:** 5/31/17 **Weather:** 50's cloudy / Rain

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 556 MPS

**Calibrated By:** JCA **Serial Number:** 07b00122

| Parameters | Cal. Expiration Date | Morning Calibration Time 900 | Cal. Temperature °C | Afternoon Calibration Time 1400 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 12/31/17 | 1.410 / 1.413 | 16.97 | 1.420 | 17.31 |
| pH (7) | 12/31/2018 | 6.93 / 7.00 | | 6.97 | |
| pH (4) | 12/31/2018 | 4.09 / 4.00 | | 4.10 | |
| pH (10) | 12/31/2018 | 9.93 / 10.00 | | 10.17 | |
| ORP (240 mv) | 5/21/2018 | 237.2 / 240.1 | | 237.3 | |
| Dissolved Oxygen (%) | N/A | 93.6% / 109.2% | | 103.6% | |
| Dissolved Oxygen (mg/L) | | – | | – | |
| Barometric Pressure (mmHg) | | – | | – | |

**Notes:**

**Signature:** [signature] **Date:** 5/31/17

KGS

**Field Instrument Calibration Log**

**Project/Site Name:** Shepley's Hill Landfill
**Calibrated By:** Ian Valentino
**Instrument:** YSI
**Serial Number:** 11J102413
**Date:** 5/31/17
**Weather:** Slight Rain

| Parameters | Morning Calibration Time 0805 | Cal. Temperature °C | Afternoon Calibration Time 1240 | Cal. Temperature °C |
|---|---|---|---|---|
| Conductivity (µS/cm°) | 1.388 → 1.413 | 13.07 | 1.654 | 14.24 |
| pH (7) | 7.48 → 7.00 | 13.34 | 6.96 | 14.18 |
| pH (4) | 4.28 → 4.00 | 13.11 | 4.54 | 14.16 |
| pH (10) | 9.66 → 10.00 | 12.52 | 9.40 | 14.55 |
| ORP (mv) | 215.7 → 246 | 13.00 | 240.3 | 14.51 |
| Dissolved Oxygen (mg/L) | 12.30 | 10.65 | 11.09 | 13.76 |
| Barometric Pressure (mmHg) | 767.8 | 13.00 | 766.5 | 13.86 |
| | | | | |

**Notes:**

**Signature:**

**Date:** 5/31/17

KGS

# Field Instrument Calibration Log

**Date:** 6/1/17

**Weather:** Sunny/overcast Scattered Showers 77°F

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017

**Instrument:** YSI 650 MDS

**Calibrated By:** Melissa Miller

**Serial Number:** COL1207AP

| Parameters | Cal. Expiration Date | Morning Calibration Time 805 | Cal. Temperature °C | Afternoon Calibration Time 1205 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 10/17 | 1.416 – 1.413 | 15.71 | 1.411 → 1.413 | 17.23 |
| pH (7) | 10/18 | 7.05 → 7.00 | 16.53 | 6.98 → 7.00 | 18.37 |
| pH (4) | 10/18 | 3.87 → 4.00 | 16.57 | 3.92 → 4.00 | 18.40 |
| pH (10) | 10/17 | 9.99 → 10.00 | 16.29 | 9.89 → 10.00 | 18.13 |
| ORP (240 mv) | 6/21 | 235.5 → 240.0 | 15.76 | 238.2 → 240.0 | 17.68 |
| Dissolved Oxygen (%) | N/A | 101.3 → 100.0 | 15.48 | 100.9 → 100.0 | 17.32 |
| Dissolved Oxygen (mg/L) | N/A | 10.10 → 9.96 | 15.49 | 10.06 → 9.90 | 17.34 |
| Barometric Pressure 760.0 (mmHg) | N/A | — | — | — | — |

**Notes:**

**Signature:** Melissa A Miller

**Date:** 6/1/17

KGS

# Field Instrument Calibration Log

**Date:** 6/1/17 **Weather:** 70's

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 556 MPS

**Calibrated By:** [illegible] **Serial Number:** 07H100122

| Parameters | Cal. Expiration Date | Morning Calibration Time 710 | Cal. Temperature °C | Afternoon Calibration Time 1340 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 12/31/17 | 1.397 / 1.413 | 16.49 | 1.420 | 17.09 |
| pH (7) | 12/31/18 | 6.89 / 7.00 | | 7.03 | |
| pH (4) | 12/31/18 | 3.79 / 4.00 | | 4.09 | |
| pH (10) | 12/31/18 | 10.11 / 10.00 | | 10.02 | |
| ORP (240 mv) | 5/21/18 | 236.4 / 240.0 | | 240.3 | |
| Dissolved Oxygen (%) | N/A | 111.1% / 100.0% | | 102.1% | |
| Dissolved Oxygen (mg/L) | | — | | — | |
| Barometric Pressure (mmHg) | | — | | — | |

**Notes:**

**Signature:** [illegible] **Date:** 6/1/17

KGS

## Field Instrument Calibration Log

**Project/Site Name:** Shelley's Hill Landfill
**Calibrated By:** Ian Valentine
**Instrument:** YSI 556 MPS
**Serial Number:** 11J102413
**Date:** 6/1/17
**Weather:** Sunny

| Parameters | Morning Calibration Time 0745 | Cal. Temperature °C | Afternoon Calibration Time 1401 | Cal. Temperature °C |
|---|---|---|---|---|
| Conductivity (µS/cm°) | 1.400 → 1.413 | 13.74 | 1.399 | 19.96 |
| pH (7) | 7.21 → 7.00 | 13.97 | 6.95 | 20.59 |
| pH (4) | 4.04 → 4.00 | 13.87 | 4.29 | 20.78 |
| pH (10) | 9.74 → 10.00 | 14.05 | 9.85 | 20.60 |
| ORP (mv) | 238.9 → 240.0 | 13.80 | 231.8 | 20.23 |
| Dissolved Oxygen (mg/L) | 11.41 | 12.31 | 10.20 | 17.46 |
| Barometric Pressure (mmHg) | 763.3 | 12.31 | 762.6 | 17.46 |
| | | | | |

**Notes:**

**Signature:**

**Date:** 6/1/17

KGS

# Field Instrument Calibration Log

**Date:** 6/2/17 **Weather:** Sunny 53-71°F

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 650 MDS

**Calibrated By:** Melissa Miller **Serial Number:** 001207 AD

| Parameters | Cal. Expiration Date | Morning Calibration Time 805 | Cal. Temperature °C | Afternoon Calibration Time 1215 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 10/17 | 1.438 → 1.413 | 15.65 | 1.390 → 1.413 | 20.44 |
| pH (7) | 10/18 | 7.44 → 7.00 | 17.41 | 6.93 → 7.00 | 19.05 |
| pH (4) | 10/18 | 3.90 → 4.00 | 17.34 | 4.25 → 4.00 | 19.17 |
| pH (10) | 10/17 | 9.01 → 10.00 | 16.82 | 9.83 → 10.00 | 20.09 |
| ORP (240 mv) | 6/21 | 235.9 → 240.0 | 19.06 | 240.1 → | 20.10 |
| Dissolved Oxygen (%) | N/A | 101.7 → 100.0 | 13.99 | 99.7 → 100 | 19.76 |
| Dissolved Oxygen (mg/L) | N/A | 10.48 → 10.31 | 13.99 | 9.11 → 9.14 | 19.76 |
| Barometric Pressure 760 (mmHg) | NA | — | — | — | — |

**Notes:**

**Signature:** Melissa A Miller **Date:** 6/2/17

KGS

# Field Instrument Calibration Log

**Date:** 6/2/17 **Weather:** clear / 70's

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 556 MPS

**Calibrated By:** VGA **Serial Number:** 07K100172

| Parameters | Cal. Expiration Date | Morning Calibration Time 705 | Cal. Temperature °C | Afternoon Calibration Time _____ | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 12/31/17 | 1.408 / 1.413 | 16.97 | 1.419 | 17.06 |
| pH (7) | 12/31/17 | 6.99 / 7.00 | | 7.03 | |
| pH (4) | 12/31/17 | 4.07 / 4.00 | | 4.00 | |
| pH (10) | 12/31/17 | 10.15 / 10.00 | | 10.06 | |
| ORP (240 mv) | 5/21/18 | 236.3 / 240.0 | | 239.9 | |
| Dissolved Oxygen (%) | N/A | 97.6% / 100.0% | | 103.1% | |
| Dissolved Oxygen (mg/L) | – | – | | | |
| Barometric Pressure (mmHg) | – | – | | | |

**Notes:**

**Signature:** [signature] **Date:** 6/2/17

KGS

**Field Instrument Calibration Log**

**Project/Site Name:** Shepley's Hill landfill
**Calibrated By:** Ian Valentine
**Instrument:** YSI 556 MPS
**Serial Number:** 15102413
**Date:** 6/2/17
**Weather:** Sunny

| Parameters | Morning Calibration Time 0748 | Cal. Temperature °C | Afternoon Calibration Time 1216 | Cal. Temperature °C |
|---|---|---|---|---|
| Conductivity (µS/cm°) | 1.527 → 1.413 | 13.48 | 1.303 | 20.15 |
| pH (7) | 7.52 → 7.00 | 13.71 | 7.03 | 19.50 |
| pH (4) | 3.94 → 4.00 | 14.98 | 4.23 | 18.83 |
| pH (10) | 9.85 → 10.00 | 13.71 | 9.76 | 19.85 |
| ORP (mv) | 237.4 → 240.0 | 14.97 | 223.7 | 20.9 |
| Dissolved Oxygen (mg/L) | 11.64 | 10.88 | | |
| Barometric Pressure (mmHg) | 764.1 | 10.88 | | |
| | | | | |

**Notes:**

**Signature:** [signature]

**Date:** 6/2/17

KGS

# Field Instrument Calibration Log

**Date:** 6/5/17

**Weather:** Overcast / scattered showers

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017

**Instrument:** YSI 650 MDS

**Calibrated By:** Melissa Miller

**Serial Number:** 00L1207 AD

| Parameters | Cal. Expiration Date | Morning Calibration Time 815 | Cal. Temperature °C | Afternoon Calibration Time 1255 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 10/17 | 1.426 → 1.413 | 15.02 | 1.397 → 1.413 | ~~15.08~~ 15.68 MM |
| pH (7) | 10/18 | 7.38 → 7.00 | 15.50 | 6.77 → 7.00 | 15.57 |
| pH (4) | 10/18 | 3.95 → 4.00 | 15.51 | 4.09 → 4.0 | 15.46 |
| pH (10) | 10/17 | 9.99 → 10.00 | 15.33 | 9.93 → 10.00 | 15.63 |
| ORP (240 mv) | 6/21 | 243.6 → 240.0 | 15.12 | 241.5 → 240.0 | 15.40 |
| Dissolved Oxygen (%) | NA | 102.7 → 100 | 14.69 | 100.7 → 100.0 | 14.93 |
| Dissolved Oxygen (mg/L) | NA | 10.42 → 10.15 | 14.67 | 10.17 → 10.10 | 14.93 |
| Barometric Pressure 760 (mmHg) | NA ~~760~~ | — | — | — | — |

**Notes:**

**Signature:** Melissa Miller

**Date:** 6/5/17

KGS

# Field Instrument Calibration Log

**Date:** 6/5/17 **Weather:** Rain

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 556 MPS

**Calibrated By:** LLA **Serial Number:** 07H00122

| Parameters | Cal. Expiration Date | Morning Calibration Time 705 | Cal. Temperature °C | Afternoon Calibration Time 1330 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 12/31/17 | 1.399 / 1.413 | 16.43 | 1.918 | |
| pH (7) | 12/31/17 | 6.86 / 7.00 | | 7.03 | |
| pH (4) | 12/31/17 | 3.96 / 4.00 | | 4.07 | |
| pH (10) | 12/31/17 | 9.76 / 10.00 | | 10.03 | |
| ORP (240 mv) | 5/21/18 | 234.2 / 240.0 | | 241.6 | |
| Dissolved Oxygen (%) | N/A | 107.6% / 100.1% | | 101.7% | |
| Dissolved Oxygen (mg/L) | — | | | | |
| Barometric Pressure (mmHg) | — | | | | |

**Notes:**

**Signature:** [signature] **Date:** 6/5/17

KGS

**Field Instrument Calibration Log**

**Project/Site Name:** Sitepleys Hill landFill **Instrument:** YSI **Date:** 6/5/17
**Calibrated By:** Jon Valentine **Serial Number:** 11J102413 **Weather:** Cloudy

| Parameters | Morning Calibration Time 0750 | Cal. Temperature °C | Afternoon Calibration Time 1245 | Cal. Temperature °C |
|---|---|---|---|---|
| Conductivity (µS/cm°) | 1.251 → 1.413 | 14.54 | 1.234 | 14.50 |
| pH (7) | 6.97 → 7.00 | 15.42 | 6.50 | 14.90 |
| pH (4) | 4.05 → 4.00 | 15.63 | 3.99 | 13.50 |
| pH (10) | 9.82 → 10.00 | 14.35 | 10.11 | 15.01 |
| ORP (mv) | 233.5 → 240.0 | 15.02 | 255 | 15.01 |
| Dissolved Oxygen (mg/L) | 11.32 | 12.00 | 11.32 | 14.85 |
| Barometric Pressure (mmHg) | 761.8 | 11.92 | 761.8 | 12.86 |
| | | | | |

**Notes:**

**Signature:** [signature] **Date:** 6/5/17

KGS

# Field Instrument Calibration Log

**Date:** 6/6/17 **Weather:** RAIN / COLD

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 650 MDS

**Calibrated By:** Melissa Miller **Serial Number:** 00L1207 AP

| Parameters | Cal. Expiration Date | Morning Calibration Time 1105 | Cal. Temperature °C | Afternoon Calibration Time 1347 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 10/17 | 1.451 → 1.413 | 15.03 | 1.398 → 1.413 | 13.82 |
| pH (7) | 10/18 | 7.39 → 7.00 | 14.11 | 7.05 → 7.00 | 12.98 |
| pH (4) | 10/18 | 4.02 → 4.00 | 14.26 | 3.98 → 4.00 | 13.07 |
| pH (10) | 10/17 | 9.85 → 9.99 | 15.10 | 9.97 → 10.00 | 13.90 |
| ORP (240 mv) | 6/21 | 240.4 → 240.0 | 14.73 | 240.1 → 240.0 | 13.52 |
| Dissolved Oxygen (%) | NA | 103.6 → 100.0 | 14.31 | 90.9 → 100.0 | 13.16 |
| Dissolved Oxygen (mg/L) | NA | 10.60 → 10.24 | 14.31 | 9.39 → 10.49 | 13.16 |
| Barometric Pressure 760 (mmHg) | NA | — | — | — | — |

**Notes:**

**Signature:** Melissa A Miller **Date:** 6/6/17

KGS

# Field Instrument Calibration Log

**Date:** 6/6/17

**Weather:** Heavy Rain

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017

**Instrument:** YSI 556 MPS

**Calibrated By:** [illegible]

**Serial Number:** 07 61 00 122

| Parameters | Cal. Expiration Date | Morning Calibration Time 710 | Cal. Temperature °C | Afternoon Calibration Time 1500 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 12/31/17 | 1.367 / 1.413 | 15.97 | 1.420 | |
| pH (7) | 12/31/17 | 6.83 / 6.99 | | 7.02 | |
| pH (4) | 12/31/17 | 4.11 / 4.00 | | 4.01 | |
| pH (10) | 12/31/17 | 9.86 / 10.01 | | 9.98 | |
| ORP (240 mv) | 5/21/18 | 236.7 / 240.0 | | 239.0 | |
| Dissolved Oxygen (%) | N/A | 96.4% / 100.2% | | 101.6% | |
| Dissolved Oxygen (mg/L) | – | | | | |
| Barometric Pressure (mmHg) | – | | | | |

**Notes:**

**Signature:** [illegible]

**Date:** 6/6/17

KGS

# Field Instrument Calibration Log

**Project/Site Name:** Shepley's Hill Landfill **Instrument:** YSI **Date:** 6/6/17

**Calibrated By:** Ian Valentino **Serial Number:** 11J102413 **Weather:** rain

| Parameters | Morning Calibration Time 0800 | Cal. Temperature °C | Afternoon Calibration Time 1400 | Cal. Temperature °C |
|---|---|---|---|---|
| Conductivity (µS/cm$^c$) | 1.464 → 1.413 | 8.96 | 1.151 | 8.76 |
| pH (7) | 6.97 → 7.00 | 9.61 | 7.01 | 9.70 |
| pH (4) | 4.17 → 4.00 | 9.25 | 3.97 | 9.80 |
| pH (10) | 9.73 → 10.00 | 9.87 | 10.10 | |
| ORP (mv) | 245.5 → 240 | 9.68 | 260 | |
| Dissolved Oxygen (mg/L) | 12.33 | 8.26 | 12.33 | |
| Barometric Pressure (mmHg) | 761.5 | 8.26 | 761.5 | |
| | | | | |

**Notes:**

**Signature:** [signature] **Date:** 6/7/17

KGS

# Field Instrument Calibration Log

**Date:** 6/7/17

**Weather:** sunny / clear skies

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017

**Instrument:** YSI 650 MDS

**Calibrated By:** Melissa Miller

**Serial Number:** 00L1207AD

| Parameters | Cal. Expiration Date | Morning Calibration Time 800 | Cal. Temperature °C | Afternoon Calibration Time NA | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 10/17 | 1.381 → 1.413 | 11.70 | — | — |
| pH (7) | 10/18 | 6.96 → 7.00 | 11.53 | — | — |
| pH (4) | 10/18 | 4.05 → 4.00 | 11.56 | — | — |
| pH (10) | 10/17 | 9.99 → 10.00 | 11.55 | — | — |
| ORP (240 mv) | 6/21 | 258.7 → 240.0 | 11.44 | — | — |
| Dissolved Oxygen (%) | NA | 110.8 → 100.0 | 15.75 | — | — |
| Dissolved Oxygen (mg/L) | NA | 11.30 → 9.93 | 15.75 | | |
| Barometric Pressure 760 (mmHg) | NA | — | — | — | — |

**Notes:** Reconditioned DO. Probe, sampled AM only

**Signature:** Melissa A. Miller

**Date:** 6/7/17

KGS

# Field Instrument Calibration Log

**Date:** 6/7/17 **Weather:** Partly Cloudy

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 556 MPS

**Calibrated By:** UGA **Serial Number:** 97B100122

| Parameters | Cal. Expiration Date | Morning Calibration Time 650 | Cal. Temperature °C | Afternoon Calibration Time 1345 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 12/31/17 | 1.502 / 1.419 | 16.47 | 1.420 | |
| pH (7) | 12/31/17 | 6.87 / 7.00 | | 7.06 | |
| pH (4) | 12/31/17 | 3.93 / 4.00 | | 4.03 | |
| pH (10) | 12/31/17 | 9.79 / 10.00 | | 10.03 | |
| ORP (240 mv) | 5/21/18 | 230.9 / 240.1 | | 237.6 | |
| Dissolved Oxygen (%) | N/A | 99.6% / 100.0% | | 102.3% | |
| Dissolved Oxygen (mg/L) | | | | | |
| Barometric Pressure (mmHg) | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 6/7/17

KGS

# Field Instrument Calibration Log

**Project/Site Name:** Shepley's Hill Landfill **Instrument:** YSI **Date:** 6/7/17
**Calibrated By:** Ian Valentine **Serial Number:** 11J102413 **Weather:** Sunny

| Parameters | Morning Calibration Time 0800 | Cal. Temperature °C | Afternoon Calibration Time 1200 | Cal. Temperature °C |
|---|---|---|---|---|
| Conductivity (µS/cm°) | 1.386→1.413 | 9.06 | 1.470 | 12.87 |
| pH (7) | 6.98→7.00 | 10.12 | 6.92 | 16.35 |
| pH (4) | 4.05→4.00 | 9.36 | 4.20 | 20.55 |
| pH (10) | 9.96→10.00 | 10.26 | 10.10 | 20.32 |
| ORP (mv) | 241.3→240 | 9.99 | 245.2 | 16.40 |
| Dissolved Oxygen (mg/L) | 11.76 - | 10.43 | 11.76 | 16.30 |
| Barometric Pressure (mmHg) | 764.6 | 10.50 | 764.6 | 16.30 |
| | | | | |

**Notes:**

**Signature:** [signature] **Date:** 6/7/17

KGS

# Field Instrument Calibration Log

**Date:** 6/8/17 **Weather:** Sunny / clear skys

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 650 MDS

**Calibrated By:** Melissa Miller **Serial Number:** 00L1207 AP

| Parameters | Cal. Expiration Date | Morning Calibration Time NA | Cal. Temperature °C | Afternoon Calibration Time 1235 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 10/17 | — | — | 1.426 → 1.413 | 21.40 |
| pH (7) | 10/18 | — | — | 7.21 → 7.00 | 20.33 |
| pH (4) | 10/18 | — | — | 3.75 → 4.00 | 19.93 |
| pH (10) | 10/17 | — | — | 9.89 → 10.00 | 20.36 |
| ORP (240 mv) | 6/21 | — | — | 230.2 → 240.0 | 21.53 |
| Dissolved Oxygen (%) | NA | — | — | 8.06 → 100.00 | 22.71 |
| Dissolved Oxygen (mg/L) | NA | — | — | 8.05 → 8.53 | 22.71 |
| Barometric Pressure 760 (mmHg) | NA | — | — | — | — |

**Notes:** Sampled PM only.

**Signature:** Melissa A. Miller **Date:** 6/8/17

KGS

# Field Instrument Calibration Log

**Date:** 6/8/17 **Weather:** Sunny 70's

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 556 MPS

**Calibrated By:** MA **Serial Number:** 07K100179

| Parameters | Cal. Expiration Date | Morning Calibration Time 710 | Cal. Temperature °C | Afternoon Calibration Time 1340 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 12/31/17 | 1.407 / 1.413 | 16.66 | 1.423 | 17.34 |
| pH (7) | 12/31/17 | 6.83 / 7.00 | | 7.02 | |
| pH (4) | 12/31/17 | 4.07 / 4.00 | | 3.98 | |
| pH (10) | 12/31/17 | 9.93 / 10.00 | | 10.01 | |
| ORP (240 mv) | 5/24/18 | 239.6 / 240.0 | | 241.3 | |
| Dissolved Oxygen (%) | N/A | 106.7% / 100.0% | | 101.6% | |
| Dissolved Oxygen (mg/L) | — | | | | |
| Barometric Pressure (mmHg) | — | | | | |

**Notes:**

**Signature:** [signature] **Date:** 6/8/17

KGS

**Field Instrument Calibration Log**

**Project/Site Name:** Stepleg's Hill Landfill **Instrument:** YSI **Date:** 6/8/17

**Calibrated By:** Ian Valentin **Serial Number:** 11J 102413 **Weather:** Sunny

| Parameters | Morning Calibration Time 0806 | Cal. Temperature °C | Afternoon Calibration Time 1230 | Cal. Temperature °C |
|---|---|---|---|---|
| Conductivity (µS/cm°) | 1.422 → 1.413 | 15.22 | 1.423 | 18.25 |
| pH (7) | 7.39 → 7.00 | 15.61 | 7.14 | 18.35 |
| pH (4) | 4.01 → 4.00 | 15.89 | 4.10 | 17.65 |
| pH (10) | 9.48 → 10.00 | 15.58 | 10.13 | 16.45 |
| ORP (mv) | 234.7 → 246.0 | 15.67 | 245.0 | 18.35 |
| Dissolved Oxygen (%) | 99.4% | 13.82 | 99.3 | 16.43 |
| Barometric Pressure (mmHg) | 766.5 | 13.45 | 764.8 | 16.43 |
| | | | | |

**Notes:**

**Signature:** [signature] **Date:** 6/8/17

KGS

# Field Instrument Calibration Log

**Date:** 6/9/17 **Weather:** Sunny / Partial Clouds

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 650 MDS

**Calibrated By:** Melissa Miller **Serial Number:** 00L 1207 AD

| Parameters | Cal. Expiration Date | Morning Calibration Time 815 | Cal. Temperature °C | Afternoon Calibration Time 1212 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 10/17 | 1.361 → 1.413 | 16.53 | 1.420 → 1.413 | 20.91 |
| pH (7) | 10/18 | 7.13 → 7.00 | 18.15 | 6.95 → 7.00 | 19.60 |
| pH (4) | 10/18 | 3.90 → 4.00 | 18.23 | 4.01 → 4.00 | 19.79 |
| pH (10) | 10/17 | 9.68 → 10.00 | 17.94 | 9.79 → 10.00 | 20.14 |
| ORP (240 mv) | 6/21 | 241.8 → 240.0 | 16.97 | 242.2 → 240.0 | 20.61 |
| Dissolved Oxygen (%) | NA | 98.8 → 100.00 | 16.28 | 98.4 → 100 | 22.18 |
| Dissolved Oxygen (mg/L) | NA | 9.70 → 9.82 | 16.28 | 8.58 → 8.72 | 22.18 |
| Barometric Pressure 760 (mmHg) | NA | — | — | — | — |

**Notes:**

**Signature:** Melissa A. Miller **Date:** 6/9/17

KGS

# Field Instrument Calibration Log

**Date:** 6/12/17 **Weather:** Hot/clear skies

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 650 MDS

**Calibrated By:** Melissa Miller **Serial Number:** 00L1207AD

| Parameters | Cal. Expiration Date | Morning Calibration Time 0910 | Cal. Temperature °C | Afternoon Calibration Time 1320 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 10/17 | 1.407 → 1.413 | 22.75 | 1.406 → 1.413 | 28.26 |
| pH (7) | 10/18 | 7.23 → 7.00 | 23.01 | 6.79 → 7.00 | 25.65 |
| pH (4) | 10/18 | 3.84 → 4.00 | 23.06 | 4.09 → 4.00 | 25.85 |
| pH (10) | 10/17 | 9.85 → 10.00 | 22.83 | 9.95 → 10.00 | 26.24 |
| ORP (240 mv) | 6/21 | 235.7 → 240.0 | 22.51 | 236.3 → 240.0 | 27.50 |
| Dissolved Oxygen (%) | NA | 107.9 → 100.0 | 24.24 | 119.6 → 100.0 | 29.28 |
| Dissolved Oxygen (mg/L) | NA | 9.02 → 8.38 | 24.24 | 9.15 → 7.65 | 29.28 |
| Barometric Pressure 760 (mmHg) | NA | — | — | — | — |

**Notes:**

**Signature:** Melissa A. Miller **Date:** 6/12/17

KGS

# Field Instrument Calibration Log

**Date:** 6/13/17 (13)

**Weather:** Sunny 90's

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017

**Instrument:** YSI 556 MPS

**Calibrated By:** MA

**Serial Number:** 07K100122

| Parameters | Cal. Expiration Date | Morning Calibration Time 705 | Cal. Temperature °C | Afternoon Calibration Time 1400 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 12/31/17 | 1.397 / 1.412 | 18.37 | 1.410 | 19.21 |
| pH (7) | 12/31/17 | 6.87 / 7.00 | | 7.03 | |
| pH (4) | 12/31/17 | 3.79 / 4.00 | | 4.01 | |
| pH (10) | 12/31/17 | 10.10 / 10.00 | | 9.97 | |
| ORP (240 mv) | 5/21/18 | 236.4 / 240.1 | | 239.4 | |
| Dissolved Oxygen (%) | MA | 102.1% / 100.1% | | 101.3% | |
| Dissolved Oxygen (mg/L) | — | | | | |
| Barometric Pressure (mmHg) | — | | | | |

**Notes:**

**Signature:** [signature]

**Date:** 6/13/17

KGS

# Field Instrument Calibration Log

Date: 6/13/17

Weather: Hot clear skies

Project/Site Name: 1024-003 Shepley's Landfill Spring 2017

Instrument: YSI 650 MDS

Calibrated By: Melissa Miller

Serial Number: 00L1207 AD

| Parameters | Cal. Expiration Date | Morning Calibration Time 830 | Cal. Temperature °C | Afternoon Calibration Time 1235 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 10/17 | 1.395 → 1.413 | 23.87 | 1.400 → 1.413 | 29.93 |
| pH (7) | 10/18 | 7.09 → 7.00 | 25.06 | 7.14 → 7.00 | 27.82 |
| pH (4) | 10/18 | 4.01 → 4.00 | 25.14 | 3.74 → 4.00 | 28.05 |
| pH (10) | 10/17 | 9.85 → 10.00 | 24.83 | 9.85 → 10.00 | 28.76 |
| ORP (240 mv) | 6/21 | 238.2 → 240.0 | 23.99 | 236.9 → 240.0 | 29.72 |
| Dissolved Oxygen (%) | NA | 112.7 → 100.0 | 23.94 | 93.5 → 100.0 | 29.73 |
| Dissolved Oxygen (mg/L) | NA | 9.50 → 8.43 | 23.94 | 7.11 → 7.60 | 29.73 |
| Barometric Pressure 760 (mmHg) | NA | — | — | — | — |

Notes:

Signature: [signature]

Date: 6/13/17

KGS

# Field Instrument Calibration Log

**Date:** 6/14/17 **Weather:** Clear skies

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 650 MDS

**Calibrated By:** Melissa Miller **Serial Number:** 00L1207 AD

| Parameters | Cal. Expiration Date | Morning Calibration Time 825 | Cal. Temperature °C | Afternoon Calibration Time 1320 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 10/17 | 1.420 → 1.413 | 22.17 | 1.398 → 1.413 | 23.21 |
| pH (7) | 10/18 | 7.19 → 7.00 | 24.26 | 6.98 → 7.00 | 25.63 |
| pH (4) | 10/18 | 3.86 → 4.00 | 24.10 | 3.97 → 4.00 | 25.07 |
| pH (10) | 10/17 | 9.87 → 10.00 | 23.61 | 9.92 → 10.00 | 24.82 |
| ORP (240 mv) | 6/21 | 243.4 → 240.0 | 22.61 | 237.2 → 240.0 | 23.75 |
| Dissolved Oxygen (%) | NA | 114.5 → 100.0 | 20.89 | 123.7 → 100 | 21.23 |
| Dissolved Oxygen (mg/L) | NA | 10.24 → 8.93 | 20.89 | 11.47 → 9.24 | 21.23 |
| Barometric Pressure 760 (mmHg) | NA | — | — | — | — |

**Notes:**

**Signature:** Melissa A. Miller **Date:** 6/14/17

KGS

# Field Instrument Calibration Log

**Date:** 6/14/17 **Weather:** 80's

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 556 MPS

**Calibrated By:** KGA **Serial Number:** 07K100122

| Parameters | Cal. Expiration Date | Morning Calibration Time 710 | Cal. Temperature °C | Afternoon Calibration Time 1400 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 12/31/17 | 1.443 / 1.413 | 17.97 | 1.413 | 19.40 |
| pH (7) | 12/31/17 | 6.88 / 7.00 | | 7.03 | |
| pH (4) | 12/13/17 | 3.97 / 4.00 | | 4.01 | |
| pH (10) | 12/13/17 | 9.78 / 10.00 | | 10.01 | |
| ORP (240 mv) | ~~KGA~~ 5/24/18 | 237.4 / 240.1 | | 238.7 | |
| Dissolved Oxygen (%) | N/A | 94.7% / 101.1% | | 103.0% | |
| Dissolved Oxygen (mg/L) | — | | | | |
| Barometric Pressure (mmHg) | — | | | | |

**Notes:**

**Signature:** [signature] **Date:** 6/14/17

KGS

# Field Instrument Calibration Log

**Date:** 6/15/17 **Weather:** Clear skies

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 650 MDS

**Calibrated By:** Melissa Miller **Serial Number:** 00L1207 AD

| Parameters | Cal. Expiration Date | Morning Calibration Time 815 | Cal. Temperature °C | Afternoon Calibration Time 1240 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 10/17 | 1.392 → 1.413 | 16.24 | 1.408 → 1.413 | 17.73 |
| pH (7) | 10/18 | 6.92 → 7.00 | 18.61 | 6.98 → 7.00 | 19.82 |
| pH (4) | 10/18 | 4.08 → 4.00 | 18.56 | 3.98 → 4.00 | 19.76 |
| pH (10) | 10/17 | 9.93 → 10.00 | 18.06 | 9.97 → 100 | 19.21 |
| ORP (240 mv) | 6/21 | 246.9 → 240.0 | 16.86 | 239.1 → 240.0 | 17.82 |
| Dissolved Oxygen (%) | NA | 106.5 → 100.0 | 15.32 | 98.9 → 100.0 | 16.88 |
| Dissolved Oxygen (mg/L) | NA | 10.62 → 9.97 | 15.38 | 9.79 → 8.14 | 16.88 |
| Barometric Pressure 760 (mmHg) | NA | — | — | — | — |

**Notes:**

**Signature:** Melissa Miller **Date:** 6/15/17

KGS

# Field Instrument Calibration Log

**Date:** 6/15/17 **Weather:** 80s

**Project/Site Name:** 1024-003 Shepley's Landfill Spring 2017 **Instrument:** YSI 556 MPS

**Calibrated By:** VGA **Serial Number:** 07 61 00122

| Parameters | Cal. Expiration Date | Morning Calibration Time 615 | Cal. Temperature °C | Afternoon Calibration Time 1410 | Cal. Temperature °C |
|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 12/31/17 | 1.397 / 1.413 | 16.89 | 1.420 | 18.05 |
| pH (7) | 12/31/17 | 6.73 / 7.00 | | 6.97 | |
| pH (4) | 12/31/17 | 4.02 / 4.00 | | 4.03 | |
| pH (10) | 12/31/17 | 10.09 / 10.00 | | 10.11 | |
| ORP (240 mv) | 5/21/18 | 234.6 / 240.0 | | 238.9 | |
| Dissolved Oxygen (%) | N/A | 106.9% / 100.1% | | 103.1% | |
| Dissolved Oxygen (mg/L) | – | | | | |
| Barometric Pressure (mmHg) | – | | | | |

**Notes:**

**Signature:** [signature] **Date:** 6/15/17

KGS

# Turbidity Instrument Calibration Log

**Project/Site Name:** 1024-003 Shepley's Spring 2017
**Calibrated By:** [illegible]

**Instrument:** LaMotte 2020WE
**Serial Number:** A02735

| Date | Pre-Cal 0 NTU AM | Post-Cal 0 NTU AM | Pre-Cal 10 NTU AM | Post-Cal 10 NTU AM | Pre-Cal 0 NTU PM | Post-Cal 0 NTU PM | Pre-Cal 10 NTU PM | Post-Cal 10 NTU PM |
|---|---|---|---|---|---|---|---|---|
| 5/23 | 0.07 | 0.00 | 9.79 | 10.00 | 0.02 | 0.00 | 9.99 | 10.00 |
| 5/24 | 0.09 | 0.00 | 9.86 | 10.00 | 0.04 | 0.00 | 9.89 | 10.00 |
| 5/25 | 0.03 | 0.00 | 9.89 | 10.00 | 0.03 | 0.00 | 10.03 | 10.00 |
| 5/31 | 0.06 | 0.00 | 10.27 | 10.00 | 0.09 | 0.00 | 10.21 | 10.00 |
| 6/1 | 0.09 | 0.00 | 10.47 | 10.00 | 0.06 | 0.00 | 10.03 | 10.00 |
| 6/2 | 0.01 | 0.00 | 10.31 | 10.00 | 0.13 | 0.00 | 10.15 | 10.00 |
| | | | | | | | | |
| | | | | | | | | |

**Signature:** [illegible]

**Date:** 6/2/17

KGS

# Turbidity Instrument Calibration Log

**Project/Site Name:** Shepley's Hill landfill
**Calibrated By:** Ian Valentino

**Instrument:** LaMotte 2020we
**Serial Number:** 3597-3513

| Date | Pre-Cal 0 NTU AM | Pre-Cal 0 NTU AM | Post-Cal 10 NTU AM | Post-Cal 10 NTU AM | Pre-Cal 0 NTU PM | Pre-Cal 0 NTU PM | Post-Cal 10 NTU PM | Post-Cal 10 NTU PM |
|---|---|---|---|---|---|---|---|---|
| 5/31/17 | 0.00 | 0.01 | 10.00 | 10.00 | 0 | 0 | 10 | 10 |
| 6/1/17 | 0.01 | 0.97 | 10.22 | 10.01 | 0.02 | 0.99 | 10.34 | 10.20 |
| 6/2/17 | 0.00 | 1.03 | 10.01 | 10.04 | 0.03 | 1.01 | 9.78 | 9.75 |
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**Signature:** [signature]

**Date:** 6/2/17

## Turbidity Instrument Calibration Log

**Project/Site Name:** Shepleys Spring '17
**Calibrated By:** Melissa Miller

**Instrument:** La Motte we
**Serial Number:** 3450-2313

| Date | Pre-Cal 0 NTU AM | ~~Pre~~-Cal 0 NTU Post AM | ~~Post~~-Cal 10 NTU Pre AM | Post-Cal 10 NTU AM | Pre-Cal 0 NTU PM | ~~Pre~~-Cal 0 NTU Post PM | ~~Post~~-Cal 10 NTU Pre PM | Post-Cal 10 NTU PM |
|---|---|---|---|---|---|---|---|---|
| 5/23/17 850 / 1205 | 0.13 ~~0.0~~ | 0.0 | 9.41 | 9.47 | 0.07 | 0.05 | 9.97 | 9.99 |
| 5/24/17 823 1220 | 0.01 | 0.0 | 8.96 | 9.72 | 0.05 | 0.01 | 9.92 | 9.98 |
| 5/25/17 823 1305 | 0.04 | 0.1 | 8.55 | 9.92 | 0.03 | 0.00 | 9.97 | 10.0 |
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| | | | | | | | | |

**Signature:** Melissa Miller

**Date:** 5/25/17

KGS

# Turbidity Instrument Calibration Log

**Project/Site Name:** 1024-003 Shepley's Spring 2017
**Calibrated By:** Melissa Miller

**Instrument:** LaMotte 2020 we
**Serial Number:** 3450-2313

| Date | Pre-Cal 0 NTU AM | Post-Cal 0 NTU AM | Pre-Cal 10 NTU AM | Post-Cal 10 NTU AM | Pre-Cal 0 NTU PM | Post-Cal 0 NTU PM | Pre-Cal 10 NTU PM | Post-Cal 10 NTU PM |
|---|---|---|---|---|---|---|---|---|
| 5/31/17 812 / 1236 | 0.00 | 0.00 | 8.83 | 9.76 | 0.09 | 0.05 | 9.46 | 10.01 |
| 6/1/17 750 / 1206 | 0.09 | 0.00 | 7.79 | 9.91 | 0.07 | 0.01 | 8.93 | 10.00 |
| 6/2/17 755 1235 | 0.03 | 0.00 | 8.37 | 9.76 | 0.14 | 0.06 | 8.89 | 9.59 |
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| | | | | | | | | |

**Signature:** Melissa A Miller

**Date:** 6/2/17

KGS

# Turbidity Instrument Calibration Log

**Project/Site Name:** 1024-003 Shepley's Spring 2017
**Calibrated By:** KAR

**Instrument:** Lamotte 2020WE
**Serial Number:** A02735

| Date | Pre-Cal 0 NTU AM | Post-Cal 0 NTU AM | Pre-Cal 10 NTU AM | Post-Cal 10 NTU AM | Pre-Cal 0 NTU PM | Post-Cal 0 NTU PM | Pre-Cal 10 NTU PM | Post-Cal 10 NTU PM |
|---|---|---|---|---|---|---|---|---|
| 6/5/17 | 0.09 | 0.00 | 9.69 | 10.00 | 0.04 | 0.00 | 9.87 | 10.00 |
| 6/6/17 | 0.01 | 0.00 | 10.13 | 10.00 | 0.07 | 0.00 | 10.01 | 10.00 |
| 6/7/17 | 0.09 | 0.00 | 9.73 | 10.00 | 0.01 | 0.00 | 9.86 | 10.00 |
| 6/8/17 | 0.03 | 0.00 | 10.14 | 10.00 | 0.13 | 0.00 | 9.69 | 10.00 |
| 6/13/17 | 0.02 | 0.00 | 9.73 | 10.00 | 0.17 | 0.00 | 10.15 | 10.00 |
| 6/14/17 | 0.13 | 0.00 | 10.17 | 10.00 | 0.06 | 0.00 | 10.03 | 10.00 |
| 6/15/17 | 0.19 | 0.00 | 9.89 | 10.00 | 0.03 | 0.00 | 10.11 | 10.00 |
| | | | | | | | | |

**Signature:** [illegible]

**Date:** 6/15/17

KGS

**Turbidity Instrument Calibration Log**

**Project/Site Name:** Stepleys Hill Landfill
**Calibrated By:** Ian Valentino

**Instrument:** LaMotte 2020we
**Serial Number:** 3597-3513

| Date | Pre-Cal 0 NTU AM | Pre-Cal 0 NTU AM | Post-Cal 10 NTU AM | Post-Cal 10 NTU AM | Pre-Cal 0 NTU PM | Pre-Cal 0 NTU PM | Post-Cal 10 NTU PM | Post-Cal 10 NTU PM |
|---|---|---|---|---|---|---|---|---|
| 6/5/17 | 0.01 | 0.00 | 10.07 | 10.12 | 0.00 | 0.01 | 10.01 | 10.10 |
| 6/6/17 | -0.02 | 0.00 | 10.02 | 9.94 | 0.00 | 0.02 | 10.00 | 10.09 |
| 6/7/17 | -0.04 | 0.00 | 10.15 | 10.01 | 0.01 | 0.04 | 10.15 | 10.10 |
| 6/8/17 | -0.03 | 0.01 | 10.01 | 10.30 | 0.00 | 0.00 | 10.01 | 10.00 |
| | | | | | | | | |
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**Signature:** [signature]

**Date:** 6/8/17

KGS

# Turbidity Instrument Calibration Log

**Project/Site Name:** 1024-003 Shepley's Spring 2017
**Calibrated By:** Melissa Miller

**Instrument:** Lamotte 2020 WE
**Serial Number:** 3450-2313

| Date | Pre-Cal 0 NTU AM | Post-Cal 0 NTU AM | Pre-Cal 10 NTU AM | Post-Cal 10 NTU AM | Pre-Cal 0 NTU PM | Post-Cal 0 NTU PM | Pre-Cal 10 NTU PM | Post-Cal 10 NTU PM |
|---|---|---|---|---|---|---|---|---|
| 6/5/17 800 1245 | 0.13 | 0.00 | 8.45 | 9.79 | 0.07 | 0.05 | 8.82 | 10.01 |
| 6/6/17 1110 1338 | 0.02 | 0.01 | 7.45 | 9.89 | 0.00 | 0.00 | 7.79 | 9.78 |
| 6/7/17 750 | 0.08 | 0.03 | 7.75 | 9.79 | — | — | — | — |
| 6/8/17 1315 | — | — | — | — | 0.09 | 0.05 | 7.99 | 9.78 |
| 6/9/17 845 1240 | 0.08 | 0.03 | 9.05 | 9.991 | 0.08 | 0.06 | 9.61 | 9.99 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

**Signature:** Melissa A Miller

**Date:** 6/9/17

KGS

# Turbidity Instrument Calibration Log

**Project/Site Name:** 1024-003 Shepley's Spring 2017
**Calibrated By:** Melissa Miller

**Instrument:** Lamotte-2020 We
**Serial Number:** 3450-2313

| Date | Pre-Cal 0 NTU AM | Post-Cal 0 NTU AM | Pre-Cal 10 NTU AM | Post-Cal 10 NTU AM | Pre-Cal 0 NTU PM | Post-Cal 0 NTU PM | Pre-Cal 10 NTU PM | Post-Cal 10 NTU PM |
|---|---|---|---|---|---|---|---|---|
| 6/12/17 905 1315 | 0.01 | 0.00 | 7.69 | 9.91 | 0.03 | 0.00 | 9.25 | 9.99 |
| 6/13/17 825 1300 | 0.01 | 0.00 | 11.88 | 9.54 | 0.07 | 0.00 | 7.53 | 9.81 |
| 6/14/17 815 1310 | 0.06 | 0.02 | 8.33 | 9.57 | 0.04 | 0.02 | 9.63 | 9.79 |
| 6/15/17 800 1235 | 0.02 | 0.00 | 8.93 | 9.75 | 0.01 | 0.00 | 9.72 | 9.91 |
| | | | | | | | | |
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**Signature:** Melissa Miller

**Date:** 6/15/17

# Fall 2017 LTM

**Project/Site Name:** Devens/Shepley's Hill Landfill **Date:** 11/2/2017
**Field Team Member:** KGA, MAM, CV, LK **Weather:** Cloudy 50-60's
**Water Level Meter Model:** Heron Dipper T **ATP On/Off:** On

| Location | Well ID | Time (24 hour) | Depth to Water (ft bPVC) | Depth to Bottom (ft bPVC) | Screen Interval (ft TOR) | Formation Type | Comments |
|---|---|---|---|---|---|---|---|
| North Impact Area | SHM-05-39A | 1244 | 11.07 | 38.66 | 36.74 - 38.74 | M | |
| North Impact Area | SHM-05-39B | 1242 | 11.84 | 66.33 | 65.74 - 67.74 | D | |
| North Impact Area | SHM-05-40X | 1237 | 13.93 | 33.14 | 31.93 - 33.93 | M | |
| North Impact Area | SHM-07-03 | 1225 | 19.53 | 33.26 | 24.94 - 34.94 | S | |
| North Impact Area | SHM-07-05X | 1235 | 14.33 | 64.52 | 54.83 - 64.83 | M | |
| North Impact Area | SHM-10-01 | 1030 | 1.91 | 70.72 | 63.46 - 73.46 | D | |
| North Impact Area | SHM-10-02 | 0930 | 15.71 | 64.09 | 55.84 - 65.84 | M | |
| North Impact Area | SHM-10-03 | 0923 | 24.64 | 69.63 | 60.78 - 70.78 | M | |
| North Impact Area | SHM-10-04 | 1002 | 5.11 | 64.49 | 57.61 - 67.61 | M | |
| North Impact Area | SHM-10-05A | 1155 | 24.73 | 59.90 | 49.68 - 59.68 | M | |
| North Impact Area | SHM-10-08 | 0937 | 7.12 | 56.69 | 48.50 - 58.50 | D | |
| North Impact Area | SHM-10-10 | 1047 | 9.19 | 66.57 | 57.71 - 67.71 | D | |
| North Impact Area | SHM-13-01 | 1129 | 1.80 | 50.77 | 41.31 - 51.31 | M | |
| North Impact Area | SHM-13-02 | 1035 | 10.79 | 72.73 | 61.80 - 71.80 | D | |
| North Impact Area | SHM-13-03 | 1055 | 4.31 | 51.01 | 44.14 - 54.14 | D | |
| North Impact Area | SHM-13-04 | 1140 | 18.33 | 29.97 | 19.68 - 29.68 | S | |
| North Impact Area | SHM-13-05 | 1146 | 15.87 | 86.06 | 74.75 - 84.75 | D | |
| North Impact Area | SHM-13-06 | 1043 | 15.61 | 45.68 | 35.66 - 45.66 | D | |
| North Impact Area | SHM-13-07 | 1643 | 6.13 | 35.01 | 26.53 - 36.53 | NA | |
| North Impact Area | SHM-13-08 | 1102 | 19.36 | 54.54 | 54.71 - 64.71 | D | |
| North Impact Area | SHM-13-14D | 1545 | 2.78 | 57.22 | 48.20 - 58.20 | D | |
| North Impact Area | SHM-13-14S | 1550 | 3.48 | 17.13 | 8.36 - 18.36 | S | |
| North Impact Area | SHM-13-15 | 1525 | 3.01 | 62.11 | 54.60 - 64.60 | D | |
| North Impact Area | SHM-99-31A | 1422 | 0.68 | 15.39 | 5.52 - 15.52 | S | |
| North Impact Area | SHM-99-31B | 1426 | 3.47 | 61.47 | 51.87 - 61.87 | M | |
| North Impact Area | SHM-99-31C | 1430 | 3.73 | 78.83 | 69.96 - 79.96 | D | |

| Location | Well ID | Time (24 hour) | Depth to Water (ft bPVC) | Depth to Bottom (ft bPVC) | Screen Interval (ft TOR) | Formation Type | Comments |
|---|---|---|---|---|---|---|---|
| North Impact Area | SHM-99-32X | 1444 | 9.32 | 84.06 | 74.16 - 84.16 | D | |
| North Impact Area | SHM-99-34B | 1450 | 12.12 | 74.14 | 76.72 - 81.72 | D | |
| North Impact Area | SHP-05-48A | 1435 | 3.58 | 5.49 | 5.22 -6.22 | S | |
| North Impact Area | SHP-05-48B | 1437 | 2.17 | 5.22 | 4.93 - 5.93 | S | |
| North Impact Area | SHP-05-49A | 1506 | 5.65 | 6.02 | 5.33 - 6.33 | S | |
| North Impact Area | SHP-05-49B | 1510 | 3.96 | 5.35 | 4.25 - 6.25 | S | NIA = 32 wells |
| Nearfield Area | EPA-PZ-2012-1A | 1350 | 10.62 | 27.97 | 23.88 -28.88 | S | |
| Nearfield Area | EPA-PZ-2012-1B | 1346 | 10.35 | 77.60 | 23.72 - 78.72 | D | |
| Nearfield Area | EPA-PZ-2012-2A | 1248 | 9.96 | 28.34 | 23.66 - 28.66 | S | |
| Nearfield Area | EPA-PZ-2012-2B | 1253 | 10.11 | 83.49 | 78.62 - 83.62 | D | |
| Nearfield Area | EPA-PZ-2012-3A | 1107 | 10.10 | 27.90 | 23.45 - 28.45 | S | |
| Nearfield Area | EPA-PZ-2012-3B | 1112 | 10.11 | 76.95 | 73.32 - 78.32 | D | |
| Nearfield Area | EPA-PZ-2012-4A | 1004 | 14.35 | 27.98 | 23.30 - 28.30 | S | |
| Nearfield Area | EPA-PZ-2012-4B | 1008 | 14.31 | 77.30 | 72.88 - 77.88 | D | |
| Nearfield Area | EPA-PZ-2012-5A | 1303 | 7.19 | 27.37 | 23.68 - 28.68 | S | |
| Nearfield Area | EPA-PZ-2012-5B | 1306 | 6.70 | 85.70 | 83.18 - 88.18 | D | |
| Nearfield Area | EPA-PZ-2012-6A | 0953 | 22.01 | 33.30 | 28.54 - 33.54 | S | |
| Nearfield Area | EPA-PZ-2012-6B | 0956 | 21.92 | 82.15 | 78.23 - 83.23 | D | |
| Nearfield Area | EPA-PZ-2012-7A | 1305 | 22.12 | 29.33 | 24.74 - 29.74 | S | |
| Nearfield Area | EPA-PZ-2012-7B | 1307 | 21.87 | 64.28 | 59.75 - 64.75 | D | |
| Nearfield Area | SHP-2017-01 | 0928 | 18.55 | 79.00 | 70.0 - 75.0 (^) | O | |
| Nearfield Area | SHP-2017-02 | 0934 | 19.24 | 94.50 | 85.0 - 90.0 (^) | O | |
| Nearfield Area | SHL-13 | 1217 | 6.21 | 21.40 | 6.73 - 21.73 | S | |
| Nearfield Area | SHL-22 | 1051 | 7.15 | 113.50 | 105.68 - 115.68 | D/Till | |
| Nearfield Area | SHL-23 | 0940 | 28.76 | 35.70 | 24.85 - 34.85 | O | |
| Nearfield Area | SHL-5 | 1315 | 2.50 | 13.90 | 3.70 - 13.70 | D | |
| Nearfield Area | SHL-8D | 1210 | 7.12 | 69.55 | 70.95 - 72.95 | D | |
| Nearfield Area | SHL-8S | 1207 | 7.27 | 56.60 | 54.14 - 56.14 | S | |
| Nearfield Area | SHL-9 | 1041 | 9.30 | 26.37 | 16.23 - 26.23 | S | |
| Nearfield Area | SHM-10-06 | 1147 | 18.60 | 81.70 | 72.38 -82.38 | D | |

| Location | Well ID | Time (24 hour) | Depth to Water (ft bPVC) | Depth to Bottom (ft bPVC) | Screen Interval (ft TOR) | Formation Type | Comments |
|---|---|---|---|---|---|---|---|
| Nearfield Area | SHM-10-06A | 1155 | 34.02 | 89.95 | 79.58 - 89.58 | D | |
| Nearfield Area | SHM-93-22B | 1055 | 6.91 | 94.00 | 82.55 - 92.55 | M | |
| Nearfield Area | SHM-93-22C | 1047 | 8.38 | 141.10 | 126.07 - 136.07 | D | |
| Nearfield Area | SHM-96-5B | 1324 | 6.08 | 91.59 | 81.54 - 91.54 | D/Till | |
| Nearfield Area | SHM-96-5C | 1330 | 5.49 | 81.00 | 51.00 - 61.00 | M | |
| Nearfield Area | SHP-05-45A | 0918 | 16.08 | 27.25 | 22.16 - 27.16 | S | |
| Nearfield Area | SHP-05-45B | 0920 | 16.87 | 76.70 | 67.39 - 77.39 | M | |
| Nearfield Area | SHP-05-46A | 0904 | 15.42 | 27.25 | 21.87 - 26.87 | M | |
| Nearfield Area | SHP-05-46B | 0855 | 14.74 | 76.65 | 66.57 - 76.57 | S | |
| Nearfield Area | SHP-05-47A | 1334 | 3.79 | 5.93 | 5.04 - 6.04 | S | |
| Nearfield Area | SHP-05-47B | 1337 | 1.69 | 5.91 | 5.07 - 6.07 | S | |
| Nearfield Area | SHP-2016-06A | 1704 | 28.35 | 86.05 | 82.85 - 87.85 | B | |
| Nearfield Area | SHP-2016-06B | 1708 | 22.90 | 112.55 | 103.84 - 113.84 | B | |
| Nearfield Area | SHP-2016-06C | 1711 | 22.80 | 133.95 | 124.87 - 134.87 | B | |
| Nearfield Area | SHP-2016-1A | 1741 | 14.89 | 25.64 | 15.59 - 25.59 | S | |
| Nearfield Area | SHP-2016-1B | 1726 | 16.01 | 86.48 | 77.56 - 87.56 | D | |
| Nearfield Area | SHP-2016-2A | 1504 | 13.65 | 27.39 | 22.20 - 27.20 | S | |
| Nearfield Area | SHP-2016-2B | 1508 | 13.69 | 87.90 | 82.22 - 87.22 | D | |
| Nearfield Area | SHP-2016-3A | 1030 | 10.92 | 27.50 | 22.05 - 27.05 | S | |
| Nearfield Area | SHP-2016-3B | 1035 | 10.86 | 87.90 | 82.05 - 87.05 | D | |
| Nearfield Area | SHP-2016-4A | 1519 | 17.78 | 32.74 | 27.40 - 32.40 | S | |
| Nearfield Area | SHP-2016-4B | 1524 | 17.52 | 92.85 | 87.18 - 92.18 | D | |
| Nearfield Area | SHP-2016-5A | 1015 | 14.72 | 37.75 | 27.13 - 32.13 | S | |
| Nearfield Area | SHP-2016-5B | 1018 | 14.70 | 92.90 | 87.07 - 92.07 | D | |
| Nearfield Area* | SHM-05-41A | 1254 | 10.42 | 40.45 | 41.76 - 43.76 | S | |
| Nearfield Area* | SHM-05-41B | 1252 | 10.25 | 60.87 | 61.83 - 63.83 | M | |
| Nearfield Area* | SHM-05-41C | 1256 | 10.53 | 87.82 | 97.66 - 92.66 | D | |
| Nearfield Area* | SHM-05-42A | 1402 | 4.43 | 44.28 | 43.16 - 45.16 | S | |
| Nearfield Area* | SHM-05-42B | 1406 | 4.52 | 73.38 | 73.15 - 75.15 | M | |
| Nearfield Area* | SHM-10-16 | 1357 | 7.13 | 87.22 | 77.51 - 87.51 | D | Nearfield = 54 wells |

| Location | Well ID | Time (24 hour) | Depth to Water (ft bPVC) | Depth to Bottom (ft bPVC) | Screen Interval (ft TOR) | Formation Type | Comments |
|---|---|---|---|---|---|---|---|
| Landfill Area | N5-P1 | 1438 | 23.80 | 99.76 | 97.69 - 99.69 | B | |
| Landfill Area | N5-P2 | 1434 | 24.11 | 32.73 | 25.23 - 30.23 | B | |
| Landfill Area | N6-P1 | 1201 | 37.25 | 91.29 | 88.39 - 90.39 | B | |
| Landfill Area | N7-P1 | 1034 | 30.95 | 71.32 | 68.41 - 70.41 | B | |
| Landfill Area | N7-P2 | 1025 | 31.18 | 37.34 | 31.86 - 36.86 | O | |
| Landfill Area | SHL-1 | 1351 | 4.83 | 8.13 | 2.51 - 5.51 | O | |
| Landfill Area | SHL-18 | 1229 | 18.26 | 28.77 | 7.89 - 27.89 | O | |
| Landfill Area | SHM-10-07 | 1417 | 27.11 | 50.42 | 41.84 - 51.84 | M | |
| Landfill Area | SHM-10-11 | 1147 | 40.48 | 62.57 | 52.60 - 62.60 | D | |
| Landfill Area | SHM-10-12 | 1321 | 34.01 | 57.29 | 47.60 - 57.60 | M | |
| Landfill Area | SHM-10-13 | 1428 | 25.93 | 73.26 | 63.26 - 73.26 | D | |
| Landfill Area | SHM-10-14 | 1653 | 20.09 | 82.85 | 62.82 - 82.82 | D | |
| Landfill Area | SHM-10-15 | 1446 | 24.42 | 56.66 | 46.73 - 56.73 | M | |
| Landfill Area | SHP-2016-07A | 1334 | 31.44 | 31.79 | 24.32 - 34.32 | B | |
| Landfill Area | SHP-2016-07B | 1330 | 32.85 | 80.62 | 72.35 - 82.35 | B | |
| Landfill Area | SHP-95-27X | 1211 | 14.27 | 42.71 | 32.64 - 42.64 | O | |
| Landfill Area | SHP-99-01B | 1346 | 9.72 | 9.90 | 5.40 - 9.40 | O | |
| Landfill Area | SHP-99-01C | 1341 | 19.80 | 32.08 | 21.69 - 31.69 | B | |
| Landfill Area | SHP-99-29X | 1646 | 23.97 | 30.92 | 20.88 - 30.88 | S | |
| Landfill Area | SHP-99-35X | 1312 | 36.78 | 41.81 | 31.96 - 41.96 | S | Landfill = 20 wells |
| Shepley's Hill | 20-1 | 1605 | 36.86 | 56.50 | 40.74 - 56.44 | B | |
| Shepley's Hill | 27-1 | 1537 | 34.32 | 66.28 | 60.82 - 65.82 | B | |
| Shepley's Hill | 27-2 | 1525 | 44.45 | 69.35 | 60.08 - 70.08 | B | |
| Shepley's Hill | CAP-2B | 1542 | 20.66 | 58.25 | 53.55 -58.55 | B | |
| Shepley's Hill | CH-1D | 1558 | 19.15 | 97.47 | 87.13 - 97.13 | B | |
| Shepley's Hill | CH-1S | 1604 | 18.98 | 43.06 | 38.17 - 43.17 | B | |
| Shepley's Hill | MW-1 | 1550 | 11.50 | 11.52 | 6.58 - 8.58(^) | O | |
| Shepley's Hill | MW-11A | 1607 | 8.75 | 9.00 | 4.18 - 6.18(^) | O | |
| Shepley's Hill | MW-14 | 1600 | Dry | 9.60 | 5.14 - 7.14(^) | O | |
| Shepley's Hill | MW-16 | 1610 | 9.55 | 9.56 | 5.18 - 7.18(^) | O | |

| Location | Well ID | Time (24 hour) | Depth to Water (ft bPVC) | Depth to Bottom (ft bPVC) | Screen Interval (ft TOR) | Formation Type | Comments |
|---|---|---|---|---|---|---|---|
| Shepley's Hill | MW-22 | 1540 | Dry | 8.80 | 4.70 - 6.70(^) | O | |
| Shepley's Hill | MW-4-1 | 1538 | 7.58 | 7.68 | 3.72 - 5.72(^) | O | |
| Shepley's Hill | MW-7 | 1609 | 11.98 | 12.02 | 6.98 - 8.98(^) | O | |
| Shepley's Hill | MW-9 | 1520 | 11.88 | 12.09 | 7.65 - 9.65(^) | O | |
| Shepley's Hill | Q4-1 | 1614 | 30.70 | 42.50 | 32.18 - 42.18 | B | |
| Shepley's Hill | Q5-1 | 1545 | 26.40 | 53.39 | 50.67 - 53.67 | B | |
| Shepley's Hill | Well 3-2 | 1620 | 36.45 | 59.00 | 55.92 - 59.92 | B | Shepley's Hill = 17 wells |
| Barrier Wall | N1-P1 | 1410 | 13.80 | 72.95 | 67.14 - 72.14 | D | |
| Barrier Wall | N1-P2 | 1413 | 13.75 | 48.23 | 42.15 - 47.15 | M | |
| Barrier Wall | N1-P3 | 1416 | 13.40 | 21.09 | 14.30 - 19.30 | S | |
| Barrier Wall | N2-P1 | 1259 | 5.00 | 41.78 | 36.46 - 41.46 | B | |
| Barrier Wall | N2-P2 | 1256 | 5.21 | 12.75 | 5.61 - 10.61 | S | |
| Barrier Wall | N3-P1 | 1210 | 4.30 | 37.98 | 35.02 - 37.02 | S | |
| Barrier Wall | N3-P2 | 1213 | 3.80 | 12.55 | 6.03 - 11.03 | S | |
| Barrier Wall | PZ-12-01 | 1151 | 20.16 | 35.70 | 27.70 - 37.70 | S | |
| Barrier Wall | PZ-12-02 | 1146 | 20.05 | 34.39 | 28.04 - 38.04 | S | |
| Barrier Wall | PZ-12-03 | 1036 | 19.06 | 36.55 | 27.55 - 37.55 | S | |
| Barrier Wall | PZ-12-04 | 1041 | 19.86 | 37.00 | 27.15 - 37.15 | S | |
| Barrier Wall | PZ-12-05 | 1113 | 21.18 | 34.70 | 28.65 - 38.65 | M | |
| Barrier Wall | PZ-12-06 | 1109 | 23.55 | 35.85 | 28.76 - 38.76 | M | |
| Barrier Wall | PZ-12-07 | 1025 | 26.40 | 33.22 | 23.79 - 33.79 | M | |
| Barrier Wall | PZ-12-08 | 1032 | 25.02 | 32.35 | 21.09 - 35.09 | M | |
| Barrier Wall | PZ-12-09 | 1005 | 21.98 | 32.15 | 23.50 - 33.50 | S | |
| Barrier Wall | PZ-12-10 | 1000 | 21.35 | 32.32 | 23.30 - 33.30 | S | |
| Barrier Wall | SHL-10 | 1254 | 29.94 | 38.67 | 25.40 - 40.40 | S | |
| Barrier Wall | SHL-11 | 1157 | 18.20 | 29.85 | 13.52 - 28.52 | S | |
| Barrier Wall | SHL-19 | 1008 | 20.09 | 32.45 | 21.91 - 31.91 | S | |
| Barrier Wall | SHL-20 | 1140 | 18.00 | 50.40 | 40.23 - 50.23 | D | |
| Barrier Wall | SHL-3 | 1236 | 29.57 | 34.15 | 25.15 - 35.15 | M | |
| Barrier Wall | SHL-4 | 1120 | 10.00 | 14.65 | 4.40 - 14.40 | S | |

| Location | Well ID | Time (24 hour) | Depth to Water (ft bPVC) | Depth to Bottom (ft bPVC) | Screen Interval (ft TOR) | Formation Type | Comments |
|---|---|---|---|---|---|---|---|
| Barrier Wall | SHM-11-02 | 1104 | 22.32 | 68.90 | 41.07 - 51.07(^) | B | |
| Barrier Wall | SHM-11-06 | 1500 | 19.42 | 35.82 | 27.84 - 37.84 | S | |
| Barrier Wall | SHM-11-07 | 1051 | 22.35 | 48.00 | 43.61 - 48.61 | B | |
| Barrier Wall | SHP-01-36X | 1315 | 7.15 | 12.89 | 6.96 - 11.98 | S | |
| Barrier Wall | SHP-01-37X | 1323 | 5.95 | 10.44 | 5.12 - 10.12 | S | |
| Barrier Wall | SHP-01-38A | 1234 | 3.59 | 9.06 | 3.59 - 8.59 | S | |
| Barrier Wall | SHP-01-38B | 1237 | 3.72 | 25.52 | 20.15 - 25.15 | D | |
| Barrier Wall | SHP-05-43 | 1349 | 44.60 | 61.21 | 52.29 - 62.29 | S | |
| Barrier Wall | SHP-05-44 | 1341 | 41.55 | 60.74 | 53.99 - 63.99 | M | |
| Barrier Wall | RSK-7 | 1250 | 5.00 | 11.15 | 5.45 - 10.45 | S | |
| Barrier Wall | RSK-15 | 1125 | 8.06 | 14.62 | 9.85 - 14.85 | S | |
| Barrier Wall | RSK-19 | 1243 | 1.58 | 9.66 | 4.98 - 9.98 | S | |
| Barrier Wall | RKS-25 | 1017 | 21.01 | 26.36 | 20.68 - 25.68 | S | |
| Barrier Wall | RSK-27 | 1058 | 22.70 | 26.10 | 21.22 - 26.22 | S | |
| Barrier Wall | RSK-28 | 1055 | 20.75 | 26.10 | 21.40 - 26.40 | S | |
| Barrier Wall | RSK-32 | 1045 | 18.60 | 25.95 | 21.04 - 26.04 | S | |
| Barrier Wall | RSK-34 | 0905 | 15.82 | 24.00 | 18.61 - 23.61 | S | |
| Barrier Wall | RSK-35 | 0900 | 16.71 | 25.51 | 22.65 - 26.65 | S | |
| Barrier Wall | RSK-37 | 1227 | 4.47 | 8.80 | 33.91 - 38.91 | S | Barrier Wall = 42 Wells |
| Upgradient | SHL-12 | 1110 | 22.10 | 28.71 | 16.40 - 31.40 | O | |
| Upgradient | SHL-15 | 1129 | 18.38 | 26.53 | 15.40 - 25.40 | O | |
| Upgradient | SHL-17** | 1014 | 6.86 | 18.49 | 7.91 - 17.91 | O | |
| Upgradient | SHL-24 | 0953 | 14.95 | 120.45 | 111.96 - 121.96 | D/B | |
| Upgradient | SHL-7 | 0934 | 17.19 | 23.74 | 12.55 - 22.55 | O | |
| Upgradient | SHM-93-10D | 1424 | 29.99 | 58.80 | 48.70 - 58.70* | B | |
| Upgradient | SHM-93-18B | 1222 | 17.71 | 91.23 | 80.60 - 90.60 | O | |
| Upgradient | SHM-93-24A | 0947 | 15.20 | 25.84 | 16.23 - 26.23 | O | |
| Upgradient/borders AOC32 | 32M-01-14XOB | 1443 | 25.57 | 30.00 | 19.56 -29.56 | O | |
| Upgradient/borders AOC32 | 32M-92-01X | 1136 | 18.51 | 26.03 | 15.61 - 25.61 | O | |
| Upgradient/borders AOC32 | 32Z-01-07XOB | 1122 | 16.17 | 24.92 | 14.50 - 24.50 | O | |

| Location | Well ID | Time (24 hour) | Depth to Water (ft bPVC) | Depth to Bottom (ft bPVC) | Screen Interval (ft TOR) | Formation Type | Comments |
|---|---|---|---|---|---|---|---|
| Upgradient/borders AOC32 | SHL-25 | 1100 | 36.32 | 36.32 | 25.23 - 35.23 | O | Ugradient = 12 wells |
| Surface Water | PSP-01 | | 2.00 | | | SW | Staff Gauge |
| Surface Water | SHSG-13-01G | | 1.60 | | | SW | Staff Gauge |
| Surface Water | SHSG-13-02G | | 3.30 | | | SW | Staff Gauge |
| Surface Water | SHSG-13-03G | Unable to Locate | | | | SW | Staff Gauge |
| Surface Water | SHSG-14-01G | | 3.10 | | | SW | Staff Gauge = 5 |
| **Total** | **182** | | | | | | |

**Notes:**
(1) LTM/EPA added analyses: dissolved As, Fe, Mn, DOC, alkalinity, chloride and sulfate (per 2015 LTMMP Update)
HYDRAULIC LIST Annual (Fall) Only (per 2015 LTMMP Update)
Destroyed wells removed from program (2017): N4-P1, N4-P2, N4-P3, and SHP-99-34A
^ - screen interval approximated based boring log depth and DTB (no well construction log available)
* - wells listed in LTMMP Table 1 as located in Northern Impact Area but are actually in Nearfield Area
() - screen interval a based on ft below ground surface (ftbgs) not ftTOR
All coordinates are on the Massachusetts State Plane Coordinate System of NAD 1983 and vertically on NAVD 1988.
Control Point S127-S is referenced benchmark.

S - shallow overburden
M - mid overburden
D - deep overburden
O - overburden
B - bedrock
SW - surface water
G. - gauging

**Project/Site Name:** Devens/Shepley's Hill Landfill
**Date:** 11/2/2017
**Field Team Member:** Kevin Anderson, Lynne Klosterman, Chris Vignola, Melissa Miller
**Weather:** Partially Cloudy, 60's
**ATP On/Off:** On
**Water Level Meter Model:** Heron Dipper T

| Location | Well ID | TOR Elevation (ft) | Depth to Water (ft bTOR) | Groundwater Elevations (ft bTOR) | Comments |
|---|---|---|---|---|---|
| North Impact Area | SHM-05-39A | 221.53 | 11.07 | 210.46 | |
| North Impact Area | SHM-05-39B | 221.51 | 11.84 | 209.67 | |
| North Impact Area | SHM-05-40X | 223.34 | 13.93 | 209.41 | |
| North Impact Area | SHM-07-03 | 227.90 | 19.53 | 208.37 | |
| North Impact Area | SHM-07-05X | 223.40 | 14.33 | 209.07 | |
| North Impact Area | SHM-10-01 | 209.65 | 1.91 | 207.74 | |
| North Impact Area | SHM-10-02 | 223.03 | 15.71 | 207.32 | |
| North Impact Area | SHM-10-03 | 232.05 | 24.64 | 207.41 | |
| North Impact Area | SHM-10-04 | 212.61 | 5.11 | 207.50 | |
| North Impact Area | SHM-10-05A | 235.09 | 24.73 | 210.36 | |
| North Impact Area | SHM-10-08 | 214.36 | 7.12 | 207.24 | |
| North Impact Area | SHM-10-10 | 217.11 | 9.19 | 207.92 | |
| North Impact Area | SHM-13-01 | 208.08 | 1.8 | 206.28 | |
| North Impact Area | SHM-13-02 | 218.72 | 10.79 | 207.93 | |
| North Impact Area | SHM-13-03 | 212.05 | 4.31 | 207.74 | |
| North Impact Area | SHM-13-04 | 227.02 | 18.33 | 208.69 | |
| North Impact Area | SHM-13-05 | 225.14 | 15.87 | 209.27 | |
| North Impact Area | SHM-13-06 | 223.89 | 15.61 | 208.28 | |
| North Impact Area | SHM-13-07 | 225.64 | 6.13 | 219.51 | |
| North Impact Area | SHM-13-08 | 227.90 | 19.36 | 208.54 | |
| North Impact Area | SHM-13-14D | 210.68 | 2.78 | 207.9 | |
| North Impact Area | SHM-13-14S | 211.03 | 3.48 | 207.55 | |
| North Impact Area | SHM-13-15 | 210.58 | 3.01 | 207.57 | |
| North Impact Area | SHM-99-31A | 214.34 | 0.68 | 213.66 | |
| North Impact Area | SHM-99-31B | 214.39 | 3.47 | 210.92 | |
| North Impact Area | SHM-99-31C | 214.60 | 3.73 | 210.87 | |

**Water Level Meter Model:** Heron Dipper T

| Location | Well ID | TOR Elevation (ft) | Depth to Water (ft bTOR) | Groundwater Elevations (ft bTOR) | Comments |
|---|---|---|---|---|---|
| North Impact Area | SHM-99-32X | 221.28 | 9.32 | 211.96 | |
| North Impact Area | SHP-99-34B | 224.91 | 12.12 | 212.79 | |
| North Impact Area | SHP-05-48A | 217.31 | 3.58 | 213.73 | |
| North Impact Area | SHP-05-48B | 215.96 | 2.17 | 213.79 | |
| North Impact Area | SHP-05-49A | 216.67 | 5.65 | 211.02 | |
| North Impact Area | SHP-05-49B | 215.14 | 3.96 | 211.18 | NIA = 32 wells |
| Nearfield Area | EPA-PZ-2012-1A | 223.79 | 10.62 | 213.17 | |
| Nearfield Area | EPA-PZ-2012-1B | 223.53 | 10.35 | 213.18 | |
| Nearfield Area | EPA-PZ-2012-2A | 223.38 | 9.96 | 213.42 | |
| Nearfield Area | EPA-PZ-2012-2B | 223.37 | 10.11 | 213.26 | |
| Nearfield Area | EPA-PZ-2012-3A | 222.65 | 10.10 | 212.55 | |
| Nearfield Area | EPA-PZ-2012-3B | 222.57 | 10.11 | 212.46 | |
| Nearfield Area | EPA-PZ-2012-4A | 226.60 | 14.35 | 212.25 | |
| Nearfield Area | EPA-PZ-2012-4B | 226.39 | 14.31 | 212.08 | |
| Nearfield Area | EPA-PZ-2012-5A | 220.01 | 7.19 | 212.823 | |
| Nearfield Area | EPA-PZ-2012-5B | 219.38 | 6.70 | 212.683 | |
| Nearfield Area | EPA-PZ-2012-6A | 234.25 | 22.01 | 212.24 | |
| Nearfield Area | EPA-PZ-2012-6B | 234.08 | 21.92 | 212.16 | |
| Nearfield Area | EPA-PZ-2012-7A | 234.16 | 22.12 | 212.04 | |
| Nearfield Area | EPA-PZ-2012-7B | 234.03 | 21.87 | 212.16 | |
| Nearfield Area | SHP-2017-01 | | 18.55 | | To be surveyed in 2018 |
| Nearfield Area | SHP-2017-02 | | 19.24 | | To be surveyed in 2018 |
| Nearfield Area | SHL-13 | 220.71 | 6.21 | 214.50 | |
| Nearfield Area | SHL-22 | 219.58 | 7.15 | 212.43 | |
| Nearfield Area | SHL-23 | 241.29 | 28.76 | 212.53 | |
| Nearfield Area | SHL-5 | 217.60 | 2.50 | 215.10 | |
| Nearfield Area | SHL-8D | 220.78 | 7.12 | 213.66 | |
| Nearfield Area | SHL-8S | 220.97 | 7.27 | 213.70 | |
| Nearfield Area | SHL-9 | 221.95 | 9.30 | 212.65 | |
| Nearfield Area | SHM-10-06 | 232.91 | 18.60 | 214.31 | |

**Water Level Meter Model:** Heron Dipper T

| Location | Well ID | TOR Elevation (ft) | Depth to Water (ft bTOR) | Groundwater Elevations (ft bTOR) | Comments |
|---|---|---|---|---|---|
| Nearfield Area | SHM-10-06A | 248.54 | 34.02 | 214.52 | |
| Nearfield Area | SHM-93-22B | 219.39 | 6.91 | 212.48 | |
| Nearfield Area | SHM-93-22C | 220.69 | 8.38 | 212.31 | |
| Nearfield Area | SHM-96-5B | 218.92 | 6.08 | 212.84 | |
| Nearfield Area | SHM-96-5C | 218.39 | 5.49 | 212.90 | |
| Nearfield Area | SHP-05-45A | 228.48 | 16.08 | 212.40 | |
| Nearfield Area | SHP-05-45B | 229.11 | 16.87 | 212.24 | |
| Nearfield Area | SHP-05-46A | 228.18 | 15.42 | 212.76 | Verified correct label in field. |
| Nearfield Area | SHP-05-46B | 227.60 | 14.74 | 212.86 | Verified correct label in field. |
| Nearfield Area | SHP-05-47A | 217.39 | 3.79 | 213.60 | |
| Nearfield Area | SHP-05-47B | 215.40 | 1.69 | 213.71 | |
| Nearfield Area | SHP-2016-06A | 241.90 | 28.35 | 213.55 | |
| Nearfield Area | SHP-2016-06B | 241.89 | 22.90 | 218.99 | |
| Nearfield Area | SHP-2016-06C | 241.92 | 22.80 | 219.12 | |
| Nearfield Area | SHP-2016-1A | 227.27 | 14.89 | 212.38 | |
| Nearfield Area | SHP-2016-1B | 227.24 | 16.01 | 211.23 | |
| Nearfield Area | SHP-2016-2A | 225.93 | 13.65 | 212.28 | |
| Nearfield Area | SHP-2016-2B | 225.95 | 13.69 | 212.26 | |
| Nearfield Area | SHP-2016-3A | 223.18 | 10.92 | 212.26 | |
| Nearfield Area | SHP-2016-3B | 223.18 | 10.86 | 212.32 | |
| Nearfield Area | SHP-2016-4A | 229.97 | 17.78 | 212.19 | |
| Nearfield Area | SHP-2016-4B | 229.75 | 17.52 | 212.23 | |
| Nearfield Area | SHP-2016-5A | 227.01 | 14.72 | 212.29 | |
| Nearfield Area | SHP-2016-5B | 226.95 | 14.70 | 212.25 | |
| Nearfield Area* | SHM-05-41A | 222.48 | 10.42 | 212.06 | |
| Nearfield Area* | SHM-05-41B | 222.33 | 10.25 | 212.08 | |
| Nearfield Area* | SHM-05-41C | 222.57 | 10.53 | 212.04 | |
| Nearfield Area* | SHM-05-42A | 216.81 | 4.43 | 212.38 | |
| Nearfield Area* | SHM-05-42B | 216.80 | 4.52 | 212.28 | |
| Nearfield Area* | SHM-10-16 | 219.23 | 7.13 | 212.10 | Nearfield = 54 wells |

**Water Level Meter Model:** Heron Dipper T

| Location | Well ID | TOR Elevation (ft) | Depth to Water (ft bTOR) | Groundwater Elevations (ft bTOR) | Comments |
|---|---|---|---|---|---|
| Landfill Area | N5-P1 | 242.65 | 23.80 | 218.85 | |
| Landfill Area | N5-P2 | 242.69 | 24.11 | 218.58 | |
| Landfill Area | N6-P1 | 259.02 | 37.25 | 221.77 | |
| Landfill Area | N7-P1 | 255.59 | 30.95 | 224.64 | |
| Landfill Area | N7-P2 | 256.04 | 31.18 | 224.86 | |
| Landfill Area | SHL-1 | 272.27 | 4.83 | 267.44 | |
| Landfill Area | SHL-18 | 237.56 | 18.26 | 219.30 | |
| Landfill Area | SHM-10-07 | 246.82 | 27.11 | 219.71 | |
| Landfill Area | SHM-10-11 | 263.76 | 40.48 | 223.28 | |
| Landfill Area | SHM-10-12 | 255.17 | 34.01 | 221.16 | |
| Landfill Area | SHM-10-13 | 244.77 | 25.93 | 218.84 | |
| Landfill Area | SHM-10-14 | 237.62 | 20.09 | 217.53 | |
| Landfill Area | SHM-10-15 | 243.68 | 24.42 | 219.26 | |
| Landfill Area | SHP-2016-07A | 265.30 | 31.44 | 233.86 | |
| Landfill Area | SHP-2016-07B | 265.33 | 32.85 | 232.48 | |
| Landfill Area | SHP-95-27X | 237.45 | 14.27 | 223.18 | |
| Landfill Area | SHP-99-01B | 273.16 | 9.72 | 263.44 | |
| Landfill Area | SHP-99-01C | 274.15 | 19.80 | 254.35 | |
| Landfill Area | SHP-99-29X | 243.34 | 23.97 | 219.37 | |
| Landfill Area | SHP-99-35X | 258.49 | 36.78 | 221.71 | Landfill = 20 wells |
| Shepley's Hill | 20-1 | 278.52 | 36.86 | 241.66 | |
| Shepley's Hill | 27-1 | 270.66 | 34.32 | 236.34 | |
| Shepley's Hill | 27-2 | 275.15 | 44.45 | 230.70 | |
| Shepley's Hill | CAP-2B | 250.21 | 20.66 | 229.55 | |
| Shepley's Hill | CH-1D | 250.59 | 19.15 | 231.44 | |
| Shepley's Hill | CH-1S | 250.63 | 18.98 | 231.65 | |
| Shepley's Hill | MW-1 | 251.84 | 11.50 | 240.34 | |
| Shepley's Hill | MW-11A | 258.57 | 8.75 | 249.82 | |
| Shepley's Hill | MW-14 | 256.61 | Dry | NA | |
| Shepley's Hill | MW-16 | 270.27 | 9.55 | 260.72 | |

**Water Level Meter Model:** Heron Dipper T

| Location | Well ID | TOR Elevation (ft) | Depth to Water (ft bTOR) | Groundwater Elevations (ft bTOR) | Comments |
|---|---|---|---|---|---|
| Shepley's Hill | MW-22 | 267.70 | Dry | NA | |
| Shepley's Hill | MW-4-1 | 247.33 | 7.58 | 239.75 | |
| Shepley's Hill | MW-7 | 249.10 | 11.98 | 237.12 | |
| Shepley's Hill | MW-9 | 243.91 | 11.88 | 232.03 | |
| Shepley's Hill | Q4-1 | 268.38 | 30.70 | 237.68 | |
| Shepley's Hill | Q5-1 | 260.99 | 26.40 | 234.59 | |
| Shepley's Hill | Well 3-2 | 268.20 | 36.45 | 231.75 | Shepley's Hill = 17 wells |
| Barrier Wall | N1-P1 | 229.92 | 13.80 | 216.12 | |
| Barrier Wall | N1-P2 | 229.93 | 13.75 | 216.18 | |
| Barrier Wall | N1-P3 | 230.08 | 13.40 | 216.68 | |
| Barrier Wall | N2-P1 | 222.01 | 5.00 | 217.01 | Corrected labels in field. |
| Barrier Wall | N2-P2 | 222.16 | 5.21 | 216.95 | Corrected labels in field. |
| Barrier Wall | N3-P1 | 220.83 | 4.30 | 216.53 | |
| Barrier Wall | N3-P2 | 220.84 | 3.80 | 217.04 | |
| Barrier Wall | PZ-12-01 | 237.55 | 20.16 | 217.39 | |
| Barrier Wall | PZ-12-02 | 237.79 | 20.05 | 217.74 | |
| Barrier Wall | PZ-12-03 | 236.40 | 19.06 | 217.34 | |
| Barrier Wall | PZ-12-04 | 238.20 | 19.86 | 218.34 | |
| Barrier Wall | PZ-12-05 | 238.73 | 21.18 | 217.55 | |
| Barrier Wall | PZ-12-06 | 242.18 | 23.55 | 218.63 | |
| Barrier Wall | PZ-12-07 | 244.59 | 26.40 | 218.19 | |
| Barrier Wall | PZ-12-08 | 244.83 | 25.02 | 219.81 | |
| Barrier Wall | PZ-12-09 | 241.93 | 21.98 | 219.95 | |
| Barrier Wall | PZ-12-10 | 242.28 | 21.35 | 220.93 | |
| Barrier Wall | SHL-10 | 248.02 | 29.94 | 218.08 | |
| Barrier Wall | SHL-11 | 235.47 | 18.20 | 217.27 | |
| Barrier Wall | SHL-19 | 240.50 | 20.09 | 220.41 | |
| Barrier Wall | SHL-20 | 235.95 | 18.00 | 217.95 | |
| Barrier Wall | SHL-3 | 246.95 | 29.57 | 217.38 | |
| Barrier Wall | SHL-4 | 227.48 | 10.00 | 217.48 | |

**Water Level Meter Model:** Heron Dipper T

| Location | Well ID | TOR Elevation (ft) | Depth to Water (ft bTOR) | Groundwater Elevations (ft bTOR) | Comments |
|---|---|---|---|---|---|
| Barrier Wall | SHM-11-02 | 240.73 | 22.32 | 218.41 | |
| Barrier Wall | SHM-11-06 | 236.17 | 19.42 | 216.75 | |
| Barrier Wall | SHM-11-07 | 240.83 | 22.35 | 218.48 | |
| Barrier Wall | SHP-01-36X | 223.95 | 7.15 | 216.8 | |
| Barrier Wall | SHP-01-37X | 222.79 | 5.95 | 216.84 | |
| Barrier Wall | SHP-01-38A | 220.86 | 3.59 | 217.27 | |
| Barrier Wall | SHP-01-38B | 221.03 | 3.72 | 217.31 | |
| Barrier Wall | SHP-05-43 | 260.71 | 44.60 | 216.11 | |
| Barrier Wall | SHP-05-44 | 258.14 | 41.55 | 216.59 | |
| Barrier Wall | RSK-7 | 222.01 | 5.00 | 217.01 | |
| Barrier Wall | RSK-15 | 225.54 | 8.06 | 217.48 | |
| Barrier Wall | RSK-19 | 218.76 | 1.58 | 217.18 | |
| Barrier Wall | RKS-25 | 239.21 | 21.01 | 218.20 | |
| Barrier Wall | RSK-27 | 241.45 | 22.70 | 218.75 | |
| Barrier Wall | RSK-28 | 239.24 | 20.75 | 218.49 | |
| Barrier Wall | RSK-32 | 236.91 | 18.60 | 218.31 | |
| Barrier Wall | RSK-34 | 233.16 | 15.82 | 217.34 | |
| Barrier Wall | RSK-35 | 233.64 | 16.71 | 216.93 | |
| Barrier Wall | RSK-37 | 220.55 | 4.47 | 216.08 | Barrier Wall = 42 Wells |
| Upgradient | SHL-12 | 248.62 | 22.10 | 226.52 | |
| Upgradient | SHL-15 | 259.92 | 18.38 | 241.54 | |
| Upgradient | SHL-17** | 233.79 | 6.86 | 226.93 | |
| Upgradient | SHL-24 | 238.75 | 14.95 | 223.80 | |
| Upgradient | SHL-7 | 236.33 | 17.19 | 219.14 | |
| Upgradient | SHM-93-10D | 248.01 | 29.99 | 218.02 | |
| Upgradient | SHM-93-18B | 237.31 | 17.91 | 219.40 | |
| Upgradient | SHM-93-24A | 238.42 | 15.20 | 223.22 | |
| Upgradient/borders AOC32 | 32M-01-14XOB | 256.56 | 25.57 | 230.99 | |
| Upgradient/borders AOC32 | 32M-92-01X | 260.17 | 18.51 | 241.66 | |
| Upgradient/borders AOC32 | 32Z-01-07XOB | 259.48 | 16.17 | 243.31 | |

**Water Level Meter Model:** Heron Dipper T

| Location | Well ID | TOR Elevation (ft) | Depth to Water (ft bTOR) | Groundwater Elevations (ft bTOR) | Comments |
|---|---|---|---|---|---|
| Upgradient/borders AOC32 | SHL-25 | 258.01 | 36.32 | 221.69 | Ugradient = 12 wells |

**Notes:**
HYDRAULIC LIST Annual (Fall) Only (per 2015 LTMMP Update)
Destroyed wells removed from program (2017): N4-P1, N4-P2, N4-P3, and SHP-99-34A
^ - screen interval approximated based boring log depth and DTB (no well construction log available)
* - wells listed in LTMMP Table 1 as located in Northern Impact Area but are actually in Nearfield Area
All coordinates are on the Massachusetts State Plane Coordinate System of NAD 1983 and vertically on NAVD 1988. Control Point S127-S is referenced
revisions made after QC of TOR

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** P2-12-02

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/3/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 20.05 |
| Depth to bottom (ft BTOR) | 34.39 |
| Screen Interval (ft BTOR) | 28.04 → 38.04 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 955 / 1025
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): —

YSI 556 MPS LIJ 100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 955 | 200 | 20.22 | 13.06 | 6.26 | 506 | 0.84 | -54.1 | 1.87 | Clear |
| 1000 | ↓ | ↓ | 13.08 | 6.30 | 491 | 0.47 | -56.9 | 1.78 | ↓ |
| 1005 | ↓ | ↓ | 13.07 | 6.31 | 480 | 0.37 | -60.5 | 1.73 | ↓ |
| 1010 | ↓ | ↓ | 13.09 | 6.30 | 479 | 0.35 | -62.7 | 1.72 | ↓ |
| 1015 | ↓ | ↓ | 13.12 | 6.30 | 477 | 0.34 | -63.1 | 1.71 | ↓ |
| 1020 | ↓ | ↓ | 13.14 | 6.31 | 477 | 0.33 | -63.7 | 1.72 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** P2-12-02-Fall17 @ 1025 Full list

[signature]
**Signature**

11/3/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** PZ-12-01

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/3/17
Location: Fort Devens Massachusetts Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | ✓ | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 20.16 |
| Depth to bottom (ft BTOR) | 35.70 |
| Screen Interval (ft BTOR) | 27.70 - 37.70 |
| Total volume purged (gal) | 5.0 |

**Sampling Type**

Purging Method geotech Tubing type poly Dedicated pump (Y/N) Tubing
Purge start/stop time 1135/1220 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) –
YSI 556/12S & IJ 10/12 / Lamotte 2020e 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1135 | 200 | 20.38 | 13.92 | 6.43 | 586 | 0.79 | -59.6 | 21.8 | Clear |
| 1140 | ↓ | 20.38 | 13.86 | 6.45 | 569 | 0.56 | -59.1 | 19.2 | ↓ |
| 1145 | ↓ | ↓ | 13.87 | 6.45 | 566 | 0.52 | -58.1 | 17.7 | ↓ |
| 1150 | ↓ | ↓ | 14.19 | 6.45 | 569 | 0.53 | -62.1 | 13.20 | ↓ |
| 1155 | ↓ | ↓ | 14.22 | 6.43 | 568 | 0.53 | -64.1 | 13.17 | ↓ |
| 1200 | ↓ | ↓ | 14.00 | 6.43 | 564 | 0.52 | -62.7 | 9.07 | ↓ |
| 1205 | ↓ | ↓ | 13.86 | 6.42 | 562 | 0.52 | -62.7 | 8.01 | ↓ |
| 1210 | ↓ | ↓ | 14.07 | 6.43 | 564 | 0.51 | -62.6 | 7.99 | ↓ |
| 1215 | ↓ | ↓ | 14.09 | 6.43 | 562 | 0.52 | -63.1 | 7.93 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Y

**Comments** PZ-12-01 - Fall 17 @ 1220 Full list

[signature]
**Signature**

11/3/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-11

Project: Shepley's Hill Landfill- Fall 2017 | Date: 11/3/17
Location: Fort Devens Massachusetts | Sampler: VHA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 18.20 |
| Depth to bottom (ft BTOR) | 29.85 |
| Screen Interval (ft BTOR) | 13.52 → 28.52 |
| Total volume purged (gal) | 5.0 |

**Sampling Type**

Purging Method: geotech | Tubing type: Poly | Dedicated pump (Y/N): Tubing
Purge start/stop time: 1250/1330 | Tubing diameter: 1/4" | Air source: N/A
Field Instrument (Model/S/N): YSI 556MPS 17J100112 / Lamotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1250 | 200 | 18.37 | 13.14 | 6.60 | 596 | 0.31 | -75.6 | 36.1 | Clear |
| 1255 | ↓ | ↓ | 13.09 | 6.60 | 597 | 0.27 | -77.7 | 26.9 | ↓ |
| 1300 | ↓ | ↓ | 13.10 | 6.61 | 599 | 0.25 | -79.4 | 23.0 | ↓ |
| 1305 | ↓ | ↓ | 13.19 | 6.61 | 596 | 0.20 | -79.3 | 18.9 | ↓ |
| 1310 | ↓ | ↓ | 13.18 | 6.61 | 594 | 0.18 | -79.2 | 14.7 | ↓ |
| 1315 | ↓ | ↓ | 13.18 | 6.61 | 593 | 0.18 | -79.2 | 14.3 | ↓ |
| 1320 | ↓ | ↓ | 13.18 | 6.61 | 591 | 0.17 | -79.1 | 14.2 | ↓ |
| 1325 | ↓ | ↓ | 13.19 | 6.61 | 590 | 0.17 | -79.0 | 14.2 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y | Duplicate (Y/N): N | MS/MSD (Y/N): N
Filter Size: 1.45 | Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Yes

**Comments** SHL-11 - Fall 17 @ 1330 Full list

Signature | Date: 11/3/17

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** P2-12-06

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/6/17
Location: Fort Devens Massachusetts Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 23.55 |
| Depth to bottom (ft BTOR) | 35.85 |
| Screen Interval (ft BTOR) | 28.76 → 38.76 |
| Total volume purged (gal) | 5.0 |

**Sampling Type**

Purging Method geotech Tubing type Poly Dedicated pump (Y/N) Tubing
Purge start/stop time 1004 800/840 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) —
YSI 556 MPS 11J100112 / LaMotte 2020wq 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 800 | 200 | 23.73 | 13.06 | 6.12 | 290 | 0.91 | -30.3 | 23.3 | clear |
| 805 | ↓ | 23.73 | 13.04 | 6.11 | 287 | 0.69 | -33.1 | 14.7 | ↓ |
| 810 | ↓ | ↓ | 13.02 | 6.10 | 285 | 0.65 | -34.8 | 11.5 | ↓ |
| 815 | ↓ | ↓ | 13.01 | 6.09 | 283 | 0.64 | -35.2 | 9.90 | ↓ |
| 820 | ↓ | ↓ | 13.02 | 6.08 | 282 | 0.63 | -36.7 | 8.15 | ↓ |
| 825 | ↓ | ↓ | 13.07 | 6.08 | 281 | 0.60 | -37.1 | 7.03 | ↓ |
| 830 | ↓ | ↓ | 13.09 | 6.08 | 280 | 0.58 | -38.9 | 7.01 | ↓ |
| 835 | ↓ | ↓ | 13.10 | 6.08 | 279 | 0.57 | -39.7 | 6.97 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): Y MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: SHL-DUP-01-Fall17 @ 845

Dedicated Tubing: (Y/N) Y

**Comments** P2-12-06-Fall17 @ 840 Fall 17

[illegible] 11/6/17
**Signature** Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** P2-42-03

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/6/17
Location: Fort Devens Massachusetts Sampler: VGT

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 19.06 |
| Depth to bottom (ft BTOR) | 36.55 |
| Screen Interval (ft BTOR) | 27.55 → 37.55 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method geotech Tubing type poly Dedicated pump (Y/N) Tubing
Purge start/stop time 1040/1115 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) —
YSI 556 MPS 115 60 112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1040 | 200 | 19.29 | 13.28 | 6.33 | 425 | 1.06 | -46.1 | 12.6 | Clear |
| 1045 | | | 13.21 | 6.39 | 423 | 0.99 | -53.3 | 9.48 | |
| 1050 | | | 13.22 | 6.37 | 422 | 0.94 | -55.1 | 9.46 | |
| 1055 | | | 13.29 | 6.39 | 421 | 0.84 | -54.2 | 9.42 | |
| 1100 | | | 13.22 | 6.40 | 419 | 0.75 | -55.2 | 9.40 | |
| 1105 | | | 13.27 | 6.43 | 417 | 0.52 | -58.9 | 9.37 | |
| 1110 | | | 13.09 | 6.44 | 417 | 0.48 | -59.9 | 9.31 | |
| 1115 | ✓ | ✓ | 13.07 | 6.44 | 416 | 0.47 | -60.1 | 9.32 | ✓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Y

**Comments** P2-42-03-Fall17 @ 1120 Full list

**Signature** Date 11/6/17

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** P2-12-08

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/6/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 25.02 |
| Depth to bottom (ft BTOR) | 32.55 |
| Screen Interval (ft BTOR) | 21.09 → 35.09 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1220/1250
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: – N/A
Field Instrument (Model/S/N): ~~N/A~~ –

YSI 556 MPS 11J 100 112 / Lamotte 2020WE 8249-9116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1220 | 200 | 25.22 | 14.45 | 5.91 | 205 | 1.38 | 73.7 | 25.7 | clear |
| 1225 | ↓ | ↓ | 14.12 | 5.93 | 201 | 0.79 | 72.1 | 25.6 | ↓ |
| 1230 | ↓ | ↓ | 14.13 | 5.82 | 201 | 0.54 | 71.8 | 25.5 | ↓ |
| 1235 | ↓ | ↓ | 14.09 | 5.82 | 200 | 0.53 | 70.9 | 25.4 | ↓ |
| 1240 | ↓ | ↓ | 13.93 | 5.82 | 196 | 0.49 | 68.1 | 24.3 | ↓ |
| 1245 | ↓ | ↓ | 13.94 | 5.82 | 194 | 0.48 | 68.0 | 24.2 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** P2-12-08- Fall 17 @ 1250 Full list

[signature]
**Signature**

11/6/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** P2-12-07

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/6/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 26.40 |
| Depth to bottom (ft BTOR) | 33.22 |
| Screen Interval (ft BTOR) | 23.79 → 33.79 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1330/1400
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): —

YSI 556MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1330 | 200 | 26.88 | 13.41 | 6.44 | 204 | 3.77 | 22.3 | 23.0 | Clear |
| 1335 | ↓ | ↓ | 13.31 | 6.38 | 206 | 3.49 | 22.4 | 19.7 | ↓ |
| 1340 | ↓ | ↓ | 13.14 | 6.36 | 209 | 3.32 | 22.7 | 18.2 | ↓ |
| 1345 | ↓ | ↓ | 13.14 | 6.36 | 209 | 3.30 | 22.8 | 17.9 | ↓ |
| 1350 | ↓ | ↓ | 13.15 | 6.37 | 211 | 3.28 | 22.9 | 17.8 | ↓ |
| 1355 | ↓ | ↓ | 13.14 | 6.37 | 212 | 3.26 | 22.9 | 17.9 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** P2-12-07- Fall17 @ 1400 Full list

[signature]
**Signature**

11/6/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** PZ-12-04

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/6/2017
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | ~~X~~ | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | ~~X~~ | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 20.07 |
| Depth to bottom (ft BTOR) | 37.00 |
| Screen Interval (ft BTOR) | 27.15-37.15 |
| Total volume purged (gal) | 4 |

**Sampling Type**

Purging Method Geotech
Purge start/stop time 1008/1120
Tubing type poly
Tubing diameter 1/4"
Dedicated pump (Y/N) N
Air source N/A
Field Instrument (Model/S/N) YSI 556 MPS: 15C103559

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1028 | 200 | 20.07 | 13.51 | 6.22 | 518 | ~~7.4~~ | -103.8 | 6.46 | clear |
| 1033 | 200 | 20.07 | 13.46 | 6.20 | 480 | ~~6.20~~ | -94.8 | 4.00 | clear |
| 1039 | 200 | 20.07 | 13.42 | 6.21 | 474 | ~~4.2~~ | -91.4 | 3.06 | clear |
| 1044 | 200 | 20.07 | 13.40 | 6.21 | 473 | 0.43 | -88.9 | 2.12 | clear |
| 1049 | 200 | 20.07 | 13.33 | 6.21 | 474 | 0.38 | -81.7 | 4.29 | clear |
| 1057 | 200 | 20.07 | 13.45 | 6.22 | 475 | 0.36 | -79.6 | 9.48 | clear |
| 1104 | 200 | 20.07 | 13.44 | 6.22 | 475 | 0.22 | -78.7 | 10.34 | clear |
| 1111 | 200 | 20.07 | 13.31 | 6.22 | 474 | 0.33 | -78.2 | 9.42 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Signature

11/6/2017
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** PZ-12-05

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/6/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | | X | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 21.3 |
| Depth to bottom (ft BTOR) | 34.70 |
| Screen Interval (ft BTOR) | 28.65 - 38.65 |
| Total volume purged (gal) | 4.5 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 1144/1303
Tubing type: Poly
Tubing diameter: 3/8"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS: 15C103559

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1205 | 200 | 21.3 | 14.15 | 6.21 | 228 | 2.16 | -29.0 | 3.19 | clear |
| 1210 | 200 | 21.3 | 13.03 | 6.05 | 227 | 0.37 | -29.9 | 1.31 | clear |
| 1215 | 200 | 21.3 | 13.16 | 6.14 | 227 | 0.30 | -39.5 | 1.05 | clear |
| 1220 | 200 | 21.3 | 12.87 | 6.17 | 227 | 0.35 | -41.5 | 1.37 | clear |
| 1225 | 200 | 21.3 | 12.93 | 6.18 | 226 | 0.18 | -38.8 | 0.87 | clear |
| 1230 | 200 | 21.3 | 12.59 | 5.95 | 225 | 0.20 | -29.6 | 1.00 | clear |
| 1235 | 200 | 21.3 | 12.51 | 6.02 | 224 | 0.18 | -29.6 | 1.14 | clear |
| 1240 | 200 | 21.3 | 12.43 | 6.07 | 225 | 0.13 | -38.7 | 1.19 | clear |
| 1245 | 200 | 21.3 | 12.48 | 6.12 | 225 | 0.16 | -43.1 | 1.29 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

± 1.03

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Signature

11/6/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHM-11-02

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/6/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | | | X |
| Well gripper present | | | X |
| Bolts present | | | X |
| Locked (stickup wells) | | X | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | Steel |
| Depth to water (ft BTOR) | 22.44 |
| Depth to bottom (ft BTOR) | 68.90 |
| Screen Interval (ft BTOR) | 41.07 - 51.07 |
| Total volume purged (gal) | 4 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 1314/1425
Tubing type: Teflon
Tubing diameter: 3/8"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS: 15C103559

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1330 | 200 | 22.44 | 13.73 | 6.66 | 335 | 4.80 | -47.7 | 9.83 | clear |
| 1335 | 200 | 25.95 | 13.24 | 7.10 | 338 | 0.59 | -131.6 | 4.52 | clear |
| 1340 | 200 | 24.33 | 13.06 | 7.27 | 347 | 0.53 | -147.6 | 4.52 | clear |
| 1345 | 200 | 24.52 | 12.87 | 7.29 | 365 | 0.50 | -130.6 | 11.10 | clear |
| 1350 | 200 | 24.52 | 12.87 | 7.30 | 379 | 0.53 | -188.4 | 12.04 | clear |
| 1355 | 200 | 24.62 | 12.99 | 7.32 | 390 | 0.37 | -173.3 | 9.50 | clear |
| 1400 | 200 | 24.62 | 13.03 | 7.31 | 403 | 0.39 | -156.1 | 9.40 | clear |
| 1405 | 200 | 24.75 | 13.05 | 7.31 | 422 | 0.37 | -158.0 | 8.00 | clear |
| 1410 | 200 | 24.75 | 13.06 | 7.32 | 442 | 0.40 | -160.9 | 5.31 | clear |
| 1415 | 200 | 24.75 | 13.07 | 7.29 | 480 | 0.40 | -166.7 | 5.71 | clear |
| 1420 | 200 | 24.75 | 13.06 | 7.26 | 500 | 0.31 | -177.6 | 5.25 | clear |
| ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Flood
**Signature**

11/6/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** PZ-12-10

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/7/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | NC | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 21.74 |
| Depth to bottom (ft BTOR) | 32.82 |
| Screen Interval (ft BTOR) | 23.30-33.30 |
| Total volume purged (gal) | 3 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 0900/1030
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): ~~YSI~~

YSI 556 MPS: 15C103559

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0925 | 150 | 21.74 | 11.94 | 7.73 | 109 | 8.95 | 162.2 | 3.89 | clear |
| 0930 | 150 | 21.74 | 11.69 | 6.52 | 84 | 7.91 | 179.1 | 2.17 | clear |
| 0935 | 150 | 21.74 | 11.70 | 6.36 | 80 | 7.62 | 171.1 | 2.19 | clear |
| 0940 | 150 | 21.74 | 11.77 | 6.32 | 77 | 7.30 | 164.5 | 1.11 | clear |
| 0945 | 150 | 21.74 | 11.39 | 6.31 | 74 | 7.75 | 161.8 | 1.60 | clear |
| 0950 | 150 | 21.74 | 11.48 | 6.30 | 76 | 6.96 | 152.6 | 0.91 | clear |
| 0955 | 150 | 21.74 | 11.83 | 6.31 | 75 | 6.87 | 144.6 | 1.82 | clear |
| 1000 | 150 | 21.74 | 11.70 | 6.30 | 75 | 7.47 | 141.6 | 1.11 | clear |
| 1005 | 150 | 21.74 | 11.90 | 6.30 | 74 | 7.16 | 132.6 | 2.64 | clear |
| 1010 | 150 | 21.74 | 12.02 | 6.30 | 74 | 7.24 | 129.9 | 1.95 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Flood
**Signature**

11/7/2017
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** PZ-12-09

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/7/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 22.75 |
| Depth to bottom (ft BTOR) | 32.15 |
| Screen Interval (ft BTOR) | 23.50 -33.50 |
| Total volume purged (gal) | 4.5 |

**Sampling Type**

Purging Method Geotech
Purge start/stop time 1050/1155
Tubing type POLY
Tubing diameter 1/4"
Dedicated pump (Y/N) N
Air source N/A
Field Instrument (Model/S/N) YSI 556 MPS: 15C103559

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1110 | 200 | 22.75 | 12.06 | 6.92 | 160 | 3.21 | 122.9 | 3.75 | clear |
| 1115 | 200 | 22.75 | 11.97 | 6.94 | 144 | 4.59 | 102.7 | 3.52 | clear |
| 1120 | 200 | 22.75 | 11.86 | 6.93 | 135 | 7.25 | 94.7 | 1.47 | clear |
| 1125 | 200 | 22.75 | 11.80 | 6.91 | 133 | 7.01 | 89.2 | 1.11 | clear |
| 1130 | 200 | 22.75 | 11.83 | 6.91 | 131 | 7.90 | 88.4 | 1.80 | clear |
| 1135 | 200 | 22.75 | 11.83 | 6.91 | 131 | 7.87 | 87.6 | 1.57 | clear |
| 1140 | 200 | 22.75 | 11.73 | 6.90 | 132 | 7.79 | 85.0 | 1.91 | clear |
| 1145 | 200 | 22.75 | 11.87 | 6.91 | 131 | 7.48 | 83.4 | 1.95 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing (Y/N) Y

**Comments**

Signature

11/7/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHL-19

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/7/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft BTOR) | 32.45 |
| Depth to bottom (ft BTOR) | 22.75 |
| Screen Interval (ft BTOR) | 21.91 – 31.91 |
| Total volume purged (gal) | 3.5 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 1220 / 1320
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): ——

YSI 556 MPS: 15C103559

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1240 | 200 | 22.75 | 12.76 | 6.60 | 158 | 7.19 | 123.3 | 3.97 | clear |
| 1245 | 200 | 22.75 | 12.68 | 6.54 | 160 | 7.11 | 102.0 | 2.66 | clear |
| 1250 | 200 | 22.75 | 12.65 | 6.53 | 160 | 7.19 | 96.3 | 3.07 | clear |
| 1255 | 200 | 22.75 | 12.64 | 6.52 | 158 | 7.03 | 94.0 | 3.65 | clear |
| 1300 | 200 | 22.75 | 12.64 | 6.53 | 158 | 7.03 | 92.4 | 2.66 | clear |
| 1305 | 200 | 22.75 | 12.62 | 6.52 | 157 | 7.24 | 90.9 | 2.78 | clear |
| 1310 | 200 | 22.75 | 12.63 | 6.51 | 156 | 7.25 | 90.9 | 2.74 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** Jarief Flood

**Signature**

11/7/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-4

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/7/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | | X | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 10.15 |
| Depth to bottom (ft BTOR) | 14.65 |
| Screen Interval (ft BTOR) | 4.40 - 14.40 |
| Total volume purged (gal) | 4 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 1335/
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS: 15C103559

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1350 | 200 | 10.15 | 12.17 | 6.64 | 172 | 0.67 | -24.5 | 8.22 | clear |
| 1355 | 200 | 10.15 | 12.25 | 6.64 | 171 | 0.37 | -46.4 | 6.64 | clear |
| 1400 | 200 | 10.15 | 12.20 | 6.64 | 169 | 0.38 | -43.1 | 4.94 | clear |
| 1405 | 200 | 10.15 | 12.23 | 6.63 | 167 | 0.24 | -45.8 | 4.52 | clear |
| 1410 | 200 | 10.15 | 12.22 | 6.63 | 167 | 0.23 | -43.2 | 4.00 | clear |
| 1415 | 200 | 10.15 | 12.24 | 6.62 | 166 | 0.30 | -41.8 | 3.04 | clear |
| 1420 | 200 | 10.15 | 12.26 | 6.62 | 165 | 0.15 | -38.7 | 4.89 | clear |
| 1425 | 200 | 10.15 | 12.25 | 6.63 | 164 | 0.23 | -38.3 | 4.27 | clear |
| 1430 | 200 | 10.15 | 12.27 | 6.62 | 163 | 0.17 | -38.2 | 4.14 | clear |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments** [illegible]

[illegible]
**Signature**

11/7/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHP-01-38A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/7/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | Steel |
| Depth to water (ft BTOR) | 3.59 |
| Depth to bottom (ft BTOR) | 9.06 |
| Screen Interval (ft BTOR) | 3.59 → 8.59 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 950/1020
Tubing type: 3/8"
Tubing diameter: poly
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): ~
YSI 556MPS 11T100112 / LaMotte 2020wE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 950 | 200 | (unable to gauge | 13.48 | 6.37 | 194 | 0.95 | -22.5 | 4.30 | Clear |
| 955 | ↓ | due to well + | 14.00 | 6.31 | 189 | 0.63 | -23.1 | 3.19 | ↓ |
| 1000 | ↓ | tubing size) | 14.01 | 6.32 | 186 | 0.42 | -24.3 | 3.21 | ↓ |
| 1005 | ↓ | | 13.98 | 6.31 | 185 | 0.33 | -24.2 | 3.19 | ↓ |
| 1010 | ↓ | | 13.97 | 6.31 | 184 | 0.31 | -24.1 | 3.17 | ↓ |
| 1015 | ↓ | | 13.96 | 6.30 | 183 | 0.30 | -24.0 | 3.16 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): ~~N/A~~ Y
Dup ID/Time: ~~N/A~~ SHL-DUP-04-Fall17 @ 1025
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SHP-01-38A - Fall17 @ 1020 Full list

[signature]
**Signature**

11/7/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHL-20

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/7/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft BTOR) | 18.00 |
| Depth to bottom (ft BTOR) | 50.40 |
| Screen Interval (ft BTOR) | 40.23 → 50.23 |
| Total volume purged (gal) | 6.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1100/1140
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): ✓
YSI 556MPS 11J1001 / Lamotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1100 | 200 | 18.04 | 11.49 | 6.43 | 467 | 0.40 | -56.4 | 26.7 | Clear |
| 1105 | ↓ | ↓ | 11.59 | 6.50 | 469 | 0.37 | -58.9 | 18.9 | ↓ |
| 1110 | ↓ | ↓ | 11.67 | 6.51 | 470 | 0.36 | -61.2 | 13.0 | ↓ |
| 1115 | ↓ | ↓ | 11.70 | 6.51 | 471 | 0.36 | -61.9 | 11.0 | ↓ |
| 1120 | ↓ | ↓ | 11.71 | 6.52 | 472 | 0.35 | -61.8 | 9.97 | ↓ |
| 1125 | ↓ | ↓ | 11.73 | 6.52 | 473 | 0.34 | -61.9 | 9.80 | ↓ |
| 1130 | ↓ | ↓ | 11.72 | 6.52 | 474 | 0.33 | -62.1 | 9.83 | ↓ |
| 1135 | ↓ | ↓ | 11.73 | 6.52 | 474 | 0.32 | -62.3 | 9.82 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): Y
Dup ID/Time: SHL-DUP-02 @ 1145
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SHL-20- Fall17 @ 1140 Full list

[signature]
**Signature**

11/7/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMM- 11-06

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/7/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 19.42 |
| Depth to bottom (ft BTOR) | 35.82 |
| Screen Interval (ft BTOR) | 27.84-37.84 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1210/1235
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556MPS 11T100112 / Lamotte 2020we 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1210 | 200 | 19.52 | 11.44 | 6.51 | 419 | 0.76 | -51.8 | 1022 | Clear |
| 1215 | ↓ | 19.52 | 11.47 | 6.52 | 417 | 0.47 | -52.6 | 8.39 | ↓ |
| 1220 | ↓ | ↓ | 11.44 | 6.53 | 415 | 0.35 | -53.5 | 7.34 | ↓ |
| 1225 | ↓ | ↓ | 11.47 | 6.52 | 414 | 0.33 | -54.2 | 7.24 | ↓ |
| 1230 | ↓ | ↓ | 11.46 | 6.52 | 413 | 0.31 | -54.9 | 7.21 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments** SMM-11-06- Fall17 @ 1235 Fall 1st

[illegible]
**Signature**

11/7/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-10-07

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/7/17
Sampler: MAL

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 27.11 |
| Depth to bottom (ft BTOR) | 50.42 |
| Screen Interval (ft BTOR) | 41.84 → 51.84 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1330 / 1405
Tubing type: teflon lined poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): —

YSI 556 MPS 11T 100 112 / Lamotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1330 | 200 | 27.63 | 11.13 | 6.67 | 375 | 1.87 | -67.7 | 15.5 | Clear |
| 1335 | ↓ | ↓ | 11.09 | 6.67 | 369 | 0.99 | -67.9 | 13.9 | ↓ |
| 1340 | ↓ | ↓ | 11.09 | 6.67 | 368 | 0.64 | -68.1 | 12.4 | ↓ |
| 1345 | ↓ | ↓ | 11.12 | 6.67 | 364 | 0.57 | -69.9 | 9.11 | ↓ |
| 1350 | ↓ | ↓ | 11.14 | 6.66 | 364 | 0.52 | -70.3 | 7.99 | ↓ |
| 1355 | ↓ | ↓ | 11.15 | 6.66 | 362 | 0.49 | -71.2 | 7.94 | ↓ |
| 1400 | ↓ | ↓ | 11.18 | 6.66 | 360 | 0.47 | -72.9 | 7.93 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Added

**Comments** SHM-10-07-Fall17 @ 1405 Full list

**Signature**

11/7/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SML-85

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/8/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 7.27 |
| Depth to bottom (ft BTOR) | 56.60 |
| Screen Interval (ft BTOR) | 54.14 → 56.14 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 835/905
Tubing type: poly
Tubing diameter: 3/8"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS [illegible] / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 835 | 200 | 8.53 | 10.23 | 6.13 | 100 | 4.28 | 112.5 | 7.83 | clear |
| 840 | ↓ | ↓ | 10.21 | 6.27 | 90 | 4.09 | 83.1 | 7.13 | ↓ |
| 845 | | | 10.17 | 6.32 | 87 | 4.02 | 69.2 | 7.00 | |
| 850 | | | 10.09 | 6.29 | 86 | 4.03 | 69.7 | 5.97 | |
| 855 | | | 10.02 | 6.28 | 85 | 4.04 | 68.8 | 5.93 | |
| 900 | | | 10.01 | 6.28 | 85 | 4.03 | 68.7 | 5.91 | |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SML-85 - Fall 17 @ 905 Full list

Signature

11/8/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SML-8D

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/8/17
Sampler: N/A

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 7.12 |
| Depth to bottom (ft BTOR) | 69.55 |
| Screen Interval (ft BTOR) | 70.95 → 72.95 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 940/1010
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): —

YSI 556 MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 940 | 200 | 7.58 | 10.05 | 6.38 | 136 | 0.54 | 50.3 | 8.97 | clear |
| 945 | ↓ | ↓ | 10.01 | 6.40 | 136 | 0.47 | 51.2 | 5.99 | ↓ |
| 950 | | | 9.98 | 6.41 | 136 | 0.37 | 46.1 | 4.97 | |
| 955 | | | 10.11 | 6.43 | 135 | 0.30 | 39.9 | 4.69 | |
| 1000 | | | 10.12 | 6.44 | 136 | 0.26 | 38.8 | 4.67 | |
| 1005 | | | 10.11 | 6.44 | 137 | 0.25 | 38.3 | 4.66 | |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SML-8D-Fall17 @ 1010 Full list

**Signature**

11/8/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** EPA-PZ-2012-2A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/8/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 9.96 |
| Depth to bottom (ft BTOR) | 28.34 |
| Screen Interval (ft BTOR) | 23.66 → 28.66 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: ~~[illegible]~~ 1050/1115
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): ~
YSI 556MPS 11J100112 / LaMotte 2020WE 8149-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1050 | 200 | 10.83 | 9.86 | 6.29 | .68 | 4.83 | 56.4 | 13.7 | Clear |
| 1055 | ↓ | ↓ | 9.90 | 6.29 | 63 | 4.77 | 57.9 | 9.21 | ↓ |
| 1100 | ↓ | ↓ | 9.95 | 6.27 | 60 | 4.75 | 58.8 | 7.12 | ↓ |
| 1105 | ↓ | ↓ | 9.97 | 6.27 | 59 | 4.73 | 59.1 | 6.97 | ↓ |
| 1110 | ↓ | ↓ | 9.96 | 6.26 | 58 | 4.72 | 59.3 | 6.96 | ↓ |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** EPA-PZ-2012-2A-Fall17 @1115 Full List

[signature]
**Signature**

11/8/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-82-2012-2B

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/8/17
Location: Fort Devens Massachusetts Sampler: KA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft BTOR) | 10.11 |
| Depth to bottom (ft BTOR) | 83.49 |
| Screen Interval (ft BTOR) | 78.62 → 83.62 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method geotech Tubing type Teflon line poly Dedicated pump (Y/N) Tubing added
Purge start/stop time 1205/1235 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) YSI 556MPS 17F100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1205 | 200 | 10.57 | 9.73 | 6.45 | 356 | 1.23 | 30.9 | 8.55 | 11.21 | clear |
| 1210 | ↓ | ↓ | 9.73 | 6.46 | 369 | 1.07 | 28.9 | 4.86 | 8.01 | ↓ |
| 1215 | | | 9.74 | 6.46 | 371 | 0.98 | 25.2 | 4.41 | 4.87 | |
| 1220 | | | 9.73 | 6.46 | 381 | 0.98 | 24.0 | 4.70 | 4.03 | |
| 1225 | | | 9.76 | 6.46 | 383 | 0.99 | 23.1 | | 3.99 | |
| 1230 | ↓ | ↓ | 9.78 | 6.46 | 386 | 0.97 | 22.9 | | 3.97 | ↓ |
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Acceptance Criteria: <0.3ft ±3% ±0.1 ±3% ±10% ± 10mv 10%

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: 1.45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Added

**Comments** EPA-82-2012-2B Fall 17 @ 1235 Fall 1st

Signature

11/8/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-2012-4B

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/8/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 14.35 |
| Depth to bottom (ft BTOR) | 77.30 |
| Screen Interval (ft BTOR) | 72.88 - 77.88 |
| Total volume purged (gal) | 3 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 0815/0945
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS: 15C103559

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0835 | 200 | 14.35 | 9.86 | 7.11 | 607 | 1.65 | -20.0 | 4.90 | clear |
| 0840 | 200 | 14.35 | 10.16 | 6.73 | 553 | 0.66 | -103.4 | 3.78 | clear |
| 0845 | 200 | 14.35 | 10.51 | 6.72 | 547 | 0.65 | -92.5 | 3.57 | clear |
| 0850 | 200 | 14.35 | 10.47 | 6.72 | 548 | 0.60 | -89.8 | 3.94 | clear |
| 0855 | 200 | 14.35 | 10.49 | 6.74 | 548 | 0.72 | -80.3 | 3.62 | clear |
| 0900 | 200 | 14.35 | 10.47 | 6.75 | 550 | 0.60 | -75.7 | 2.63 | clear |
| 0905 | 200 | 14.35 | 10.56 | 6.75 | 549 | 0.73 | -78.9 | 1.83 | clear |
| 0910 | 200 | 14.35 | 10.57 | 6.75 | 549 | 0.82 | -77.9 | 2.51 | clear |
| 0915 | 200 | 14.35 | 10.60 | 6.76 | 549 | 0.25 | -80.2 | 1.94 | clear |
| 0920 | 200 | 14.35 | 10.70 | 6.76 | 548 | 0.25 | -79.5 | 2.40 | clear |
| 0925 | 200 | 14.35 | 10.65 | 6.76 | 550 | 0.21 | -76.7 | 1.65 | clear |
| 0930 | 200 | 14.35 | 10.66 | 6.76 | 550 | 0.22 | -73.2 | 2.09 | clear |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): Y
Dup ID/Time: SHL-DUP-06/0940
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Flood
**Signature**

11/8/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-2012-4A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/8/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 14.46 |
| Depth to bottom (ft BTOR) | 27.98 |
| Screen Interval (ft BTOR) | 23.30 – 28.30 |
| Total volume purged (gal) | 3 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 1005/1125
Tubing type: POLY
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS: 15C103559

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1025 | 200 | 14.46 | 12.30 | 6.57 | 349 | 1.50 | -4.7 | 3.61 | clear |
| 1030 | 200 | 14.46 | 12.39 | 6.50 | 348 | 0.30 | -5.5 | 2.57 | clear |
| 1035 | 200 | 14.46 | 12.40 | 6.48 | 347 | 0.37 | -3.8 | 2.04 | clear |
| 1040 | 200 | 14.46 | 12.43 | 6.47 | 347 | 0.25 | -4.2 | 3.91 | clear |
| 1045 | 200 | 14.46 | 12.36 | 6.47 | 347 | 0.23 | -4.4 | 1.63 | clear |
| 1050 | 200 | 14.46 | 12.38 | 6.46 | 346 | 0.21 | -4.7 | 3.15 | clear |
| 1055 | 200 | 14.46 | 12.35 | 6.46 | 346 | 0.26 | -5.2 | 1.44 | clear |
| 1100 | 200 | 14.46 | 12.38 | 6.46 | 346 | 0.16 | -3.4 | 1.82 | clear |
| 1105 | 200 | 14.46 | 12.34 | 6.45 | 347 | 0.12 | -2.7 | 1.07 | clear |
| 1110 | 200 | 14.46 | 12.40 | 6.45 | 347 | | -2.3 | 1.73 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Flood
**Signature**

11/8/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-2012-3A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/8/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 10.28 |
| Depth to bottom (ft BTOR) | 27.90 |
| Screen Interval (ft BTOR) | 23.45-28.45 |
| Total volume purged (gal) | 3.5 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 1150/1310
Tubing type: Teflon
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS: 15C103559

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1210 | 200 | 10.28 | 12.31 | 6.34 | 378 | 1.15 | 22.9 | 3.76 | clear |
| 1215 | 200 | 10.41 | 11.35 | 6.21 | 376 | 0.50 | 18.2 | 6.84 | clear |
| 1220 | 200 | 10.41 | 11.32 | 6.19 | 375 | 0.16 | 15.8 | 4.01 | clear |
| 1225 | 200 | 10.41 | 11.27 | 6.27 | 375 | 0.08 | 13.2 | 2.36 | clear |
| 1230 | 200 | 10.41 | 11.23 | 6.28 | 375 | 0.06 | 11.7 | 1.32 | clear |
| 1235 | 200 | 10.41 | 11.15 | 6.26 | 373 | 0.04 | 10.3 | 1.12 | clear |
| 1240 | 200 | 10.41 | 11.18 | 6.22 | 372 | 0.03 | 9.9 | 1.22 | clear |
| 1245 | 200 | 10.41 | 11.15 | 6.20 | 372 | 0.02 | 10.2 | 1.31 | clear |
| 1250 | 200 | 10.41 | 11.19 | 6.16 | 371 | 0.01 | 8.2 | 0.96 | clear |
| 1255 | 200 | 10.41 | 11.22 | 6.16 | 371 | 0.02 | 8.1 | 1.83 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Flood
**Signature**

11/8/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-10-14

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/9/17
Location: Fort Devens Massachusetts Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 20.09 |
| Depth to bottom (ft BTOR) | 82.85 |
| Screen Interval (ft BTOR) | 62.82 → 82.82 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 840/905
Tubing type: teflon lined poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): added tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556MPS 11J100112 / LaMotte 2020wE 8247-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 840 | 200 | 20.05 | 10.99 | 6.49 | 461 | 1.08 | -53.0 | 5.55 | Clear |
| 845 | ↓ | ↓ | 11.13 | 6.49 | 433 | 0.70 | -51.6 | 4.80 | ↓ |
| 850 | ↓ | ↓ | 11.12 | 6.49 | 432 | 0.70 | -49.4 | 4.71 | ↓ |
| 855 | ↓ | ↓ | 11.13 | 6.49 | 431 | 0.68 | -49.3 | 4.70 | ↓ |
| 900 | ↓ | ↓ | 11.11 | 6.49 | 430 | 0.66 | -49.1 | 4.70 | ↓ |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Added

**Comments** SHM-10-14 - Fall 17 @ 905

[illegible]
**Signature**

11/9/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-99-29X

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/9/17
Location: Fort Devens Massachusetts Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 23.97 |
| Depth to bottom (ft BTOR) | 30.92 |
| Screen Interval (ft BTOR) | 20.88 → 30.88 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method geotech Tubing type poly Dedicated pump (Y/N) Tubing
Purge start/stop time 945 / 1010 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) —
YSI 556MPS 115100 112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 945 | 200 | 23.93 | 10.54 | 6.51 | 222 | 0.94 | 8.6 | 12.1 | clear |
| 950 | ↓ | ↓ | 10.57 | 6.50 | 213 | 0.69 | 5.0 | 9.01 | ↓ |
| 955 | | | 10.59 | 6.48 | 209 | 0.44 | 4.5 | 8.75 | |
| 1000 | | | 10.69 | 6.47 | 208 | 0.42 | 4.3 | 8.72 | |
| 1005 | | | 10.71 | 6.47 | 207 | 0.40 | 4.0 | 8.70 | |
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): Y MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Y

**Comments** SHP-99-29X- Fall17 @ 1010 Full list

**Signature** 11/9/17 **Date**

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-10-15

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/9/17
Location: Fort Devens Massachusetts Sampler: KA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | ✓ |
| Bolts present | | ✓ | ✓ |
| Locked (stickup wells) | | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 24.42 |
| Depth to bottom (ft BTOR) | 56.66 |
| Screen Interval (ft BTOR) | 46.73 → 56.73 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech Tubing type: poly Dedicated pump (Y/N): Tubing
Purge start/stop time: 1045 / 1120 Tubing diameter: 1/4" Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 17J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1045 | 200 | 24.43 | 10.36 | 6.69 | 323 | 1.24 | -32.4 | 6.51 | clear |
| 1050 | ↓ | ↓ | 10.36 | 6.69 | 323 | 1.19 | -31.9 | 5.99 | ↓ |
| 1055 | | | 10.35 | 6.70 | 324 | 0.54 | -31.3 | 5.87 | |
| 1100 | | | 10.36 | 6.70 | 323 | 0.52 | -31.0 | 5.61 | |
| 1105 | | | 10.37 | 6.70 | 324 | 0.49 | -31.0 | 5.55 | |
| 1110 | | | 10.35 | 6.70 | 324 | 0.48 | -30.7 | 5.54 | |
| 1115 | | | 10.40 | 6.70 | 327 | 0.47 | -30.2 | 5.52 | ✓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Y

**Comments** SHM-10-15 - Fall17 @ 1120 Full list

**Signature** 11/9/17 **Date**

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** N5-P1

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/9/17
Location: Fort Devens Massachusetts Sampler: MA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 23.80 |
| Depth to bottom (ft BTOR) | 49.76 |
| Screen Interval (ft BTOR) | 9.76 → 19.69 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method geotech Tubing type teflon lined poly Dedicated pump (Y/N) N
Purge start/stop time 1210/1235 Tubing diameter 1/4" Air source MA
Field Instrument (Model/S/N) —
YSI 556 MPS 11J 100112 / Lamotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1210 | 200 | 24.17 | 11.03 | 6.85 | 356 | 1.17 | -28.0 | 14.1 | clear |
| 1215 | ↓ | ↓ | 11.04 | 6.83 | 369 | 0.93 | -25.1 | 4.31 | ↓ |
| 1220 | ↓ | ↓ | 11.05 | 6.81 | 376 | 0.89 | -24.1 | 4.20 | ↓ |
| 1225 | ↓ | ↓ | 11.06 | 6.82 | 378 | 0.87 | -23.7 | 4.19 | ↓ |
| 1230 | ↓ | ↓ | 11.06 | 6.81 | 381 | 0.85 | -23.0 | 4.18 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): Y MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: SHL-DUP-03-Fall17 @ 1240

Dedicated Tubing: (Y/N) Added

**Comments** N5-P1-Fall17 @ 1235 Full list

**Signature** **Date** 11/9/17

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMM-10-13

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/9/17
Location: Fort Devens Massachusetts Sampler: MGT

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 25.93 |
| Depth to bottom (ft BTOR) | 73.26 |
| Screen Interval (ft BTOR) | 63.26 → 73.26 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method geotech Tubing type teflon lined poly Dedicated pump (Y/N) N
Purge start/stop time 1430 / 1500 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) —
YSI 556MPS IIJ 100112 / Lamotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1430 | 200 | 26.17 | 11.57 | 6.77 | 406 | 0.81 | -57.3 | 11.19 | clear |
| 1435 | ↓ | ↓ | 11.61 | 6.74 | 400 | 0.77 | -58.7 | 8.97 | ↓ |
| 1440 | ↓ | ↓ | 11.67 | 6.75 | 401 | 0.46 | -59.1 | 4.91 | ↓ |
| 1445 | ↓ | ↓ | 11.70 | 6.75 | 398 | 0.39 | -60.3 | 4.70 | ↓ |
| 1450 | ↓ | ↓ | 11.72 | 6.75 | 397 | 0.37 | -60.9 | 4.87 | ↓ |
| 1455 | ↓ | ↓ | 11.73 | 6.76 | 394 | 0.36 | -61.2 | 4.84 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) added

**Comments** SMM-10-13 - Fall 17 @ 1500 Full list

**Signature** 11/9/17 **Date**

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-2012-3B

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/9/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 10.5 |
| Depth to bottom (ft BTOR) | 76.95 |
| Screen Interval (ft BTOR) | 73.32 - 78.32 |
| Total volume purged (gal) | 4 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 0825/0930
Tubing type: Teflon
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): ——
YSI 556 MPS: 15C103559

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0840 | 200 | 10.5 | 9.38 | 7.30 | 580 | 1.81 | 53.3 | 34.6 | gray |
| 0845 | 200 | 10.5 | 9.56 | 6.95 | 494 | 0.54 | [illegible] | 29.4 | gray/clear |
| 0850 | 200 | 10.5 | 9.64 | 6.95 | 493 | 0.50 | -98.3 | 11.62 | clear |
| 0855 | 200 | 10.5 | 9.78 | 6.96 | 494 | 0.64 | -95.1 | 11.19 | clear |
| 0900 | 200 | 10.5 | 9.98 | 6.96 | 494 | 0.54 | -90.4 | 12.1 | clear |
| 0905 | 200 | 10.5 | 10.23 | 6.96 | 496 | 0.27 | -89.0 | 10.34 | clear |
| 0910 | 200 | 10.5 | 10.35 | 6.97 | 497 | 0.20 | -87.6 | 11.16 | clear |
| 0915 | 200 | 10.5 | 10.47 | 6.98 | 497 | 0.17 | -90.8 | 10.78 | clear |
| 0920 | 200 | 10.5 | 10.70 | 6.98 | 496 | 0.38 | -92.2 | 11.04 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Read
**Signature**

11/9/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** EPA-PZ-2012-6B

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/9/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 22.15 |
| Depth to bottom (ft BTOR) | 82.15 |
| Screen Interval (ft BTOR) | 78.23 - 83.23 |
| Total volume purged (gal) | 3.5 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 0950/1125
Tubing type: Teflon
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): —

YSI 556 MPS: 15C103559

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1010 | 200 | 22.15 | 8.85 | 7.36 | 176 | 1.86 | -57.0 | 23.0 | grey/clear |
| 1015 | 200 | 22.15 | 9.06 | 7.19 | 169 | 0.47 | -71.3 | 13.5 | clear/foggy |
| 1020 | 200 | 22.15 | 9.15 | 7.16 | 165 | 0.34 | -79.6 | 12.96 | clear/foggy |
| 1025 | 200 | 22.15 | 9.01 | 7.15 | 165 | 0.33 | -84.3 | 10.00 | clear/foggy |
| 1030 | 200 | 22.15 | 9.09 | 7.12 | 164 | 0.27 | -86.1 | 38.8 | clear/foggy |
| 1035 | 200 | 22.15 | 9.13 | 7.13 | 161 | 0.24 | -92.2 | 47.9 | clear/foggy |
| 1040 | 200 | 22.15 | 9.17 | 7.14 | 165 | 0.33 | -93.5 | 51.3 | clear/foggy |
| 1045 | 200 | 22.15 | 9.24 | 7.15 | 166 | 0.23 | -95.3 | 26.6 | clear/foggy |
| 1050 | 200 | 22.15 | 9.15 | 7.15 | 166 | 0.22 | -96.9 | 14.9 | clear ~~foggy~~ |
| 1055 | 200 | 22.15 | 9.23 | 7.15 | 166 | 0.23 | -97.3 | 10.62 | clear |
| 1100 | 200 | 22.15 | 9.21 | 7.15 | 165 | 0.28 | -97.5 | 9.84 | clear |
| 1105 | 200 | 22.15 | 9.30 | 7.15 | 165 | 0.20 | -97.7 | 4.52 | clear |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments** Additional two readings below

Jenith Flood — Signature
11/9/17 — Date

| Time | Flow | DTW | Temp | pH | SPC | DO | ORP | Turbidity | Color |
|---|---|---|---|---|---|---|---|---|---|
| 1110 | 200 | 22.15 | 9.34 | 7.13 | 165 | 0.21 | -97.8 | 4.32 | clear |
| 1115 | 200 | 22.15 | 9.34 | 7.14 | 165 | 0.19 | -97.7 | 4.55 | clear |

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-2012-6A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/9/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 22.2 |
| Depth to bottom (ft BTOR) | 33.30 |
| Screen Interval (ft BTOR) | 28.54 - 33.54 |
| Total volume purged (gal) | 3.5 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 1135/
Tubing type: Teflon
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS: 15C103559

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1155 | 200 | 22.2 | 9.44 | 7.01 | 112 | 6.31 | 29.0 | 14.09 | clear |
| 1200 | 200 | 22.2 | 9.32 | 6.87 | 111 | 4.78 | 24.0 | 9.93 | clear |
| 1205 | 200 | 22.2 | 9.37 | 6.87 | 111 | 5.33 | 24.7 | 10.80 | clear |
| 1210 | 200 | 22.2 | 9.35 | 6.84 | 111 | 4.86 | 27.4 | 8.90 | clear |
| 1215 | 200 | 22.2 | 9.64 | 6.83 | 110 | 4.67 | 29.5 | 5.43 | clear |
| 1220 | 200 | 22.2 | 9.74 | 6.84 | 110 | 4.78 | 31.3 | 3.04 | clear |
| 1225 | 200 | 22.2 | 10.01 | 6.84 | 111 | 4.70 | 34.3 | 2.96 | clear |
| 1230 | 200 | 22.2 | 9.91 | 6.83 | 110 | 4.94 | 36.1 | 3.59 | clear |
| 1235 | 200 | 22.2 | 9.22 | 6.83 | 110 | 4.99 | 38.5 | 4.15 | clear |
| 1240 | 200 | 22.2 | 9.20 | 6.80 | 111 | 5.08 | 43.4 | 4.34 | clear |
| 1245 | 200 | 22.2 | 9.23 | 6.81 | 112 | 5.17 | 43.8 | 3.35 | clear |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Flood
**Signature**

11/9/2017
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHM-96-5B

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/10/17
Sampler: VA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | ✓ |
| Bolts present | ✓ | | |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft BTOR) | 6.08 |
| Depth to bottom (ft BTOR) | 91.59 |
| Screen Interval (ft BTOR) | 81.54 → 91.54 |
| Total volume purged (gal) | 6.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 840/915
Tubing type: Poly
Tubing diameter: 3/8"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): –

YSI 556MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 840 | 200 | 6.57 | 10.38 | 6.78 | 436 | 1.08 | -27.6 | 39.7 | clear |
| 845 | ↓ | ↓ | 10.36 | 6.79 | 427 | 0.96 | -27.9 | 34.2 | ↓ |
| 850 | ↓ | ↓ | 10.32 | 6.80 | 422 | 0.73 | -28.4 | 29.1 | ↓ |
| 855 | ↓ | ↓ | 10.30 | 6.80 | 419 | 0.53 | -29.3 | 26.2 | ↓ |
| 900 | ↓ | ↓ | 10.27 | 6.79 | 409 | 0.57 | -27.1 | 25.9 | ↓ |
| 905 | ↓ | ↓ | 10.24 | 6.79 | 406 | 0.64 | -26.3 | 25.4 | ↓ |
| 910 | ↓ | ↓ | 10.23 | 6.79 | 403 | 0.66 | -26.1 | 25.3 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SHM-96-5B - Fall 17 @ 915 Full list

[signature]
**Signature**

11/10/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-96-5C

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/10/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft BTOR) | 5.49 |
| Depth to bottom (ft BTOR) | 81.00 |
| Screen Interval (ft BTOR) | 51.00 → 61.00 |
| Total volume purged (gal) | 6.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1020/1100
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): —
YSI 556 MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1020 | 200 | 5.84 | 9.52 | 6.67 | 372 | 0.97 | -8.2 | 9.77 | clear |
| 1025 | ↓ | ↓ | 9.50 | 6.67 | 370 | 0.77 | -8.0 | 7.29 | ↓ |
| 1030 | | | 9.49 | 6.67 | 369 | 0.70 | -7.5 | 7.21 | |
| 1035 | | | 9.48 | 6.67 | 367 | 0.67 | -9.3 | 6.04 | |
| 1040 | | | 9.43 | 6.67 | 367 | 0.59 | -11.0 | 5.37 | |
| 1045 | | | 9.41 | 6.67 | 366 | 0.50 | -12.6 | 4.97 | |
| 1050 | | | 9.60 | 6.66 | 365 | 0.49 | -12.7 | 4.94 | |
| 1055 | | | 9.62 | 6.66 | 365 | 0.47 | -12.9 | 4.92 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SHM-96-5C - Fall 17 @ 1100 Full list

[signature]
**Signature**

11/10/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-5

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/10/17
Sampler: N/A

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 2.50 |
| Depth to bottom (ft BTOR) | 13.90 |
| Screen Interval (ft BTOR) | 3.70 → 13.70 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1150/1220
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 11J100115 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1150 | 200 | 3.67 | 12.20 | 6.40 | 99 | 0.36 | 605 | 21.7 | clear |
| 1155 | ↓ | ↓ | 12.31 | 6.39 | 99 | 0.27 | 62.7 | 2.99 | ↓ |
| 1200 | | | 12.34 | 6.38 | 99 | 0.20 | 63.9 | 3.77 | |
| 1205 | | | 12.39 | 6.38 | 100 | 0.20 | 63.5 | 3.40 | |
| 1210 | | | 12.43 | 6.37 | 100 | 0.19 | 63.6 | 3.35 | |
| 1215 | | | 12.44 | 6.38 | 100 | 0.19 | 63.7 | 3.34 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): ~~Y~~ N

Dedicated Tubing: (Y/N) Y

**Comments** SHL-5- Fall 17 @ 1220 Fall 17

**Signature**

11/10/17
**Date**

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-2012-5A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/10/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 7.7 |
| Depth to bottom (ft BTOR) | 27.37 |
| Screen Interval (ft BTOR) | 23.68 - 28.68 |
| Total volume purged (gal) | 4 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 0945/
Tubing type: Teflon
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): ——

YSI 650 MDS: 08J100820

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1010 | 200 | 7.7 | 9.22 | 6.00 | 0.104 | 1.10 | 126.0 | 3.18 | clear |
| 1015 | 200 | 7.7 | 9.34 | 5.84 | 0.088 | 0.67 | 89.5 | 3.35 | clear |
| 1020 | 200 | 7.7 | 9.39 | 5.84 | 0.087 | 0.51 | 76.7 | 2.53 | clear |
| 1025 | 200 | 7.7 | 9.34 | 5.82 | 0.086 | 0.60 | 67.7 | 1.92 | clear |
| 1030 | 200 | 7.7 | 9.40 | 5.82 | 0.085 | 0.53 | 61.2 | 2.19 | clear |
| 1035 | 200 | 7.7 | 9.39 | 5.82 | 0.085 | 0.56 | 59.0 | 2.40 | clear |
| 1040 | 200 | 7.7 | 9.50 | 5.82 | 0.085 | 0.56 | 56.7 | 2.78 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Flood
**Sighature**

11/10/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-2012-5B

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/10/17
Location: Fort Devens Massachusetts Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 7.19 |
| Depth to bottom (ft BTOR) | 85.70 |
| Screen Interval (ft BTOR) | 83.18 - 88.18 |
| Total volume purged (gal) | 4 |

**Sampling Type**

Purging Method: Geotech Tubing type: Teflon Dedicated pump (Y/N): N
Purge start/stop time: 1100 / 1215 Tubing diameter: 1/4" Air source: N/A
Field Instrument (Model/S/N):
YSI 650 MDS: 08J100320

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1120 | 200 | 7.19 | 9.44 | 6.40 | 0.422 | 1.85 | 79.2 | 16.5 | clear/foggy |
| 1125 | 200 | 7.19 | 9.43 | 6.59 | 0.433 | 2.10 | 82.1 | 11.5 | clear |
| 1130 | 200 | 7.19 | 9.42 | 6.63 | 0.435 | 1.24 | 82.4 | 9.31 | clear |
| 1135 | 200 | 7.19 | 9.37 | 6.65 | 0.435 | 1.08 | 83.4 | 7.90 | clear |
| 1140 | 200 | 7.19 | 9.36 | 6.66 | 0.435 | 1.06 | 84.2 | 7.84 | clear |
| 1145 | 200 | 7.19 | 9.36 | 6.68 | 0.435 | 1.04 | 84.6 | 6.39 | clear |
| 1150 | 200 | 7.19 | 9.31 | 6.69 | 0.435 | 1.19 | 85.4 | 5.27 | clear |
| 1155 | 200 | 7.19 | 9.32 | 6.69 | 0.435 | 1.16 | 85.7 | 4.51 | clear |
| 1200 | 200 | 7.19 | 9.32 | 6.69 | 0.434 | 1.18 | 86.2 | 3.80 | clear |
| 1205 | 200 | 7.19 | 9.32 | 6.69 | 0.435 | 1.18 | 86.3 | 3.24 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: 0.45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Flood
**Signature**

11/10/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-93-22B

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/13/17
Location: Fort Devens Massachusetts Sampler: MA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft BTOR) | 6.91 |
| Depth to bottom (ft BTOR) | 94.00 |
| Screen Interval (ft BTOR) | 82.55 → 92.55 |
| Total volume purged (gal) | 8.0 |

**Sampling Type**

Purging Method geotech Tubing type Poly Dedicated pump (Y/N) Y bin
Purge start/stop time 1010/1040 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) YSI 556 MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1010 | 200 | 7.43 | 9.84 | 6.51 | 439 | 0.68 | -51.0 | 11.13 | clear |
| 1015 | ↓ | ↓ | 9.79 | 6.50 | 432 | 0.59 | -49.2 | 9.27 | ↓ |
| 1020 | ↓ | ↓ | 9.77 | 6.50 | 425 | 0.46 | -45.0 | 7.89 | ↓ |
| 1025 | ↓ | ↓ | 9.80 | 6.49 | 421 | 0.44 | -42.1 | 7.77 | ↓ |
| 1030 | ↓ | ↓ | 9.78 | 6.49 | 419 | 0.42 | -41.9 | 7.69 | ↓ |
| 1035 | ↓ | ↓ | 9.77 | 6.48 | 418 | 0.41 | -41.7 | 7.68 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Y

**Comments** SHM-93-22B-Fall17 @ 1040 Full list

Signature

11/13/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-22

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/13/17
Location: Fort Devens Massachusetts Sampler: WA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | | | ✓ |
| Bolts present | | | |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft BTOR) | 7.15 |
| Depth to bottom (ft BTOR) | 113.50 |
| Screen Interval (ft BTOR) | 105.68 → 115.68 |
| Total volume purged (gal) | 8.0 |

**Sampling Type**

Purging Method: geotech Tubing type: Poly Dedicated pump (Y/N): Tubing
Purge start/stop time: 1140/1210 Tubing diameter: 1/4" Air source: N/A
Field Instrument (Model/S/N): YSI 556MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1140 | 200 | 7.61 | 10.15 | 6.75 | 478 | 0.39 | 20.5 | 11.1 | Clear |
| 1145 | ↓ | ↓ | 10.21 | 6.73 | 479 | 0.34 | 26.2 | 8.99 | ↓ |
| 1150 | | | 10.19 | 6.73 | 482 | 0.32 | 34.5 | 6.21 | |
| 1155 | | | 10.39 | 6.73 | 490 | 0.29 | 36.9 | 5.99 | |
| 1200 | | | 10.31 | 6.73 | 493 | 0.27 | 37.2 | 5.97 | |
| 1205 | | | 10.36 | 6.74 | 497 | 0.26 | 37.9 | 5.96 | |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Y

**Comments** SHL-22-Fall17 @ 1210 Full list

Signature: [signature] Date: 11/13/17

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-93-22C

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/13/17
Location: Fort Devens Massachusetts Sampler: KR

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft BTOR) | 8.38 |
| Depth to bottom (ft BTOR) | 141.10 |
| Screen Interval (ft BTOR) | 126.07 → 136.07 |
| Total volume purged (gal) | 8.0 |

**Sampling Type**

Purging Method peristaltic Tubing type teflon lined poly Dedicated pump (Y/N) Added tubing
Purge start/stop time 1300/1325 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) YSI 556 MPS 11J100112 / LaMotte 2020WE 8247-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1300 | 200 | 10.97 | 9.90 | 7.24 | 296 | 3.31 | 37.5 | 6.90 | clear |
| 1305 | ↓ | 10.41 | 10.01 | 7.27 | 291 | 3.17 | 35.9 | 5.49 | ↓ |
| 1310 | ↓ | 10.80 | 10.03 | 7.31 | 289 | 3.10 | 34.7 | 5.21 | ↓ |
| 1315 | ↓ | 11.03 | 10.11 | 7.30 | 287 | 3.07 | 33.1 | 5.18 | ↓ |
| 1320 | ↓ | 11.39 | 10.09 | 7.29 | 286 | 3.01 | 32.9 | 5.12 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) added

**Comments** SHM-93-22C - Fall 17 @ 1325 Full list

**Signature** 11/13/17 **Date**

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-01-37X

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/13/17
Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| metal ~~PVC~~ casing intact | X | | |
| CAP Well ~~gripper~~ present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | metal |
| Depth to water (ft BTOR) | [redacted] um → 6.80 |
| Depth to bottom (ft BTOR) | 10.44 |
| Screen Interval (ft BTOR) | 5.12-10.12 |
| Total volume purged (gal) | 3.5 |

**Sampling Type**

Purging Method Peristaltic
Purge start/stop time 1130/1145
Tubing type teflon lined
Tubing diameter 1/4"
Dedicated pump (Y/N) N
Air source NA
Field Instrument (Model/S/N)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1150 | 450 | 6.00 | 11.69 | 6.47 | 304 | 2.24 | 15.8 | 4.93 | clear |
| 1155 | 250 | 6.60 | 11.51 | 6.46 | 303 | 1.71 | 17.9 | 4.78 | clear |
| 1200 | 125 | 6.73 | 11.28 | 6.45 | 302 | 1.86 | 19.8 | 4.69 | clear |
| 1205 | 125 | 6.75 | 11.20 | 6.43 | 301 | 1.96 | 22.9 | 3.64 | clear |
| 1210 | 125 | 6.76 | 11.21 | 6.43 | 301 | 1.93 | 24.4 | 2.93 | clear |
| 1215 | 125 | 6.75 | 11.21 | 6.43 | 301 | 1.92 | 25.9 | 2.90 | clear |
| 1220 | 125 | 6.77 | 11.22 | 6.42 | 301 | 1.91 | 25.4 | 2.88 | clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

SHP-01-37X_FAL17 @ 1222

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45 um
Duplicate (Y/N): N
Dup ID/Time:
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments**

Signature

11/13/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-01-36X

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/13/17
Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | — |
| PVC casing intact | X | | |
| Well ~~gripper~~ cap present | X | | |
| Bolts present | | | — |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | Metal |
| Depth to water (ft BTOR) | 7.01 |
| Depth to bottom (ft BTOR) | 12.89 |
| Screen Interval (ft BTOR) | 6.96-11.98 |
| Total volume purged (gal) | 3.0 |

**Sampling Type**

Purging Method Peristaltic
Purge start/stop time 1015/1035
Tubing type Teflon line
Tubing diameter 1/4"
Dedicated pump (Y/N) N
Air source NA
Field Instrument (Model/S/N) YSI 600XL

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1040 | 400 | 7.15 | 12.35 | 6.31 | 293 | 1.14 | 3.4 | 4.45 | Clear |
| 1045 | 200 | 7.10 | 12.38 | 6.31 | 293 | 1.04 | 2.0 | 3.16 | Clear |
| 1050 | 125 | 7.09 | 12.25 | 6.30 | 293 | 1.08 | 5.7 | 2.57 | clear |
| 1055 | 125 | 7.05 | 12.18 | 6.31 | 293 | 1.09 | 6.6 | 1.78 | Clear |
| 1100 | 125 | 7.06 | 12.15 | 6.30 | 293 | 1.08 | 7.0 | 1.25 | Clear |
| 1105 | 125 | 7.05 | 12.12 | 6.30 | 293 | 1.08 | 7.2 | 1.22 | clear |
| 1110 | 125 | 7.07 | 12.11 | 6.31 | 293 | 1.08 | 7.5 | 1.20 | Clear |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHP-01-36X_FAL17 @ 1112
Field Filtered (Y/N): Y
Filter Size: .45 um
Duplicate (Y/N): N
Dup ID/Time:
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N): Yes

**Comments**

Melissa A. Miller
**Signature**

11/13/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMM-13-08

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/14/17
Location: Fort Devens Massachusetts Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 19.36 |
| Depth to bottom (ft BTOR) | 54.54 |
| Screen Interval (ft BTOR) | 54.71 → 64.71 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: grafoch
Purge start/stop time: 930/1000
Tubing type: ~~PP~~ poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 930 | 200 | 20.19 | 11.34 | 7.14 | 504 | 1.25 | -117.9 | 15.2 | clear |
| 935 | ↓ | ↓ | 11.21 | 7.09 | 501 | 0.89 | -117.8 | 12.1 | ↓ |
| 940 | ↓ | ↓ | 11.18 | 7.07 | 489 | 0.69 | -117.7 | 7.01 | ↓ |
| 945 | ↓ | ↓ | 11.13 | 7.07 | 470 | 0.58 | -117.6 | 7.01 | ↓ |
| 950 | ↓ | ↓ | 11.11 | 7.06 | 467 | 0.57 | -117.4 | 6.97 | ↓ |
| 955 | ↓ | ↓ | 11.07 | 7.05 | 464 | 0.55 | -117.3 | 6.94 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SMM-13-08 - Fall 17 @ 1000 Full list

[illegible]
**Signature**

11/14/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-13-06

Project: Shepley's Hill Landfill- Fall 2017 Date: 4/14/17
Location: Fort Devens Massachusetts Sampler: VIA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | ✓ |
| Bolts present | ✓ | | |
| Locked (stickup wells) | | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 15.61 |
| Depth to bottom (ft BTOR) | 45.68 |
| Screen Interval (ft BTOR) | 35.66 → 45.66 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method peristaltic Tubing type teflon lined poly Dedicated pump (Y/N) Tubing
Purge start/stop time 1100/1130 Tubing diameter 3/8" Air source N/A
Field Instrument (Model/S/N) YSI 556MPS 15100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1100 | 200 | 17.11 | 11.44 | 7.05 | 500 | 0.74 | -108.9 | 20.6 | clear |
| 1105 | ↓ | ↓ | 11.59 | 7.06 | 507 | 0.47 | -106.7 | 18.6 | ↓ |
| 1110 | ↓ | ↓ | 11.53 | 7.07 | 511 | 0.47 | -104.2 | 17.4 | ↓ |
| 1115 | ↓ | ↓ | 11.53 | 7.07 | 515 | 0.35 | -103.8 | 17.1 | ↓ |
| 1120 | ↓ | ↓ | 11.57 | 7.07 | 517 | 0.34 | -103.2 | 17.0 | ↓ |
| 1125 | ↓ | ↓ | 11.60 | 7.07 | 518 | 0.32 | -102.1 | 17.2 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): ~~N~~ Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Y

**Comments** SHM-13-06 - Fall 17 @ 1130 Full list

**Signature** 4/14/17 **Date**

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-13-04

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/14/17
Location: Fort Devens Massachusetts Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 18.73 |
| Depth to bottom (ft BTOR) | 29.97 |
| Screen Interval (ft BTOR) | 19.68 → 29.68 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1235 / 1310
Tubing type: teflon lined poly
Tubing diameter: 3/8"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1235 | 200 | 18.79 | 11.77 | 6.66 | 810 | 2.95 | 64.3 | 15.3 | Clear |
| 1240 | ↓ | ↓ | 11.80 | 6.66 | 817 | 2.72 | 64.4 | 9.21 | ↓ |
| 1245 | | | 11.84 | 6.66 | 822 | 2.56 | 64.4 | 5.66 | |
| 1250 | | | 11.87 | 6.65 | 818 | 2.31 | 64.5 | 5.00 | |
| 1255 | | | 11.83 | 6.65 | 814 | 2.28 | 64.9 | 4.97 | |
| 1300 | | | 11.88 | 6.65 | 813 | 2.22 | 65.0 | 4.94 | |
| 1305 | ↓ | ↓ | 11.90 | 6.65 | 813 | 2.19 | 65.1 | 4.93 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SHM-13-04-Fall17 @ 1310 Full list

**Signature** [illegible]

Date 11/14/17

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-202-1A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/14/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 11.2 |
| Depth to bottom (ft BTOR) | 27.97 |
| Screen Interval (ft BTOR) | 23.88 - 28.88 |
| Total volume purged (gal) | 3.5 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 0830 /
Tubing type: Teflon
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N):

YSI 560 MDS: 08J100320

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0850 | 200 | 11.2 | 8.62 | 7.31 | 189 | 2.15 | 239.4 | 5.01 | clear |
| 0855 | 200 | 11.2 | 8.67 | 6.75 | 157 | 1.80 | 218.2 | 3.21 | clear |
| 0900 | 200 | 11.2 | 8.72 | 6.68 | 143 | 1.78 | 203.5 | 2.63 | clear |
| 0905 | 200 | 11.2 | 8.80 | 6.68 | 139 | 1.73 | 197.3 | 2.71 | clear |
| 0910 | 200 | 11.2 | 8.82 | 6.72 | 137 | 1.70 | 183.9 | 2.12 | clear |
| 0915 | 200 | 11.2 | 8.80 | 6.76 | 136 | 1.67 | 175.2 | 2.29 | clear |
| 0920 | 200 | 11.2 | 8.76 | 6.78 | 135 | 1.69 | 167.3 | 2.21 | clear |
| 0925 | 200 | 11.2 | 8.78 | 6.79 | 135 | 1.69 | 167.0 | 1.60 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Signature

11/14/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-PZ-2012-1B

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/14/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 11.04 |
| Depth to bottom (ft BTOR) | 77.60 |
| Screen Interval (ft BTOR) | 23.72 - 78.72 |
| Total volume purged (gal) | 3.5 |

**Sampling Type**
Purging Method: Geotech
Purge start/stop time: 0940/
Tubing type: Teflon
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 650 MDS: 08J100320

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1000 | 200 | 11.04 | 8.92 | 6.70 | 465 | 2.62 | 154.8 | 6.78 | clear |
| 1005 | 200 | 11.04 | 8.84 | 6.92 | 516 | 2.99 | 80.1 | 7.19 | clear |
| 1010 | 200 | 11.04 | 9.00 | 7.06 | 527 | 3.02 | 56.8 | 5.58 | clear |
| 1015 | 200 | 11.04 | 9.08 | 7.16 | 536 | 3.02 | 37.1 | 5.01 | clear |
| 1020 | 200 | 11.04 | 9.09 | 7.19 | 539 | 3.01 | 29.3 | 4.19 | clear |
| 1025 | 200 | 11.04 | 9.06 | 7.20 | 540 | 3.07 | 24.3 | 4.22 | clear |
| 1030 | 200 | 11.04 | 9.08 | 7.22 | 540 | 3.06 | 22.5 | 3.57 | clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Reed
**Signature**

11/14/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP - 2016 - 1A

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/14/17
Location: Fort Devens Massachusetts Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 16.25 |
| Depth to bottom (ft BTOR) | 25.64 |
| Screen Interval (ft BTOR) | 15.59 - 25.59 |
| Total volume purged (gal) | 3 |

**Sampling Type**

Purging Method Geotech Tubing type Teflon Dedicated pump (Y/N) N
Purge start/stop time 1115/ Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) ——

YSI 650 MDS: 08J100320

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1135 | 200 | 16.25 | 10.95 | 7.68 | 79 | 6.78 | 41.4 | 2.73 | clear |
| 1140 | 200 | 16.25 | 11.13 | 7.50 | 76 | 6.41 | 51.6 | 1.77 | clear |
| 1145 | 200 | 16.25 | 11.20 | 7.22 | 74 | 6.04 | 68.4 | 2.07 | clear |
| 1150 | 200 | 16.25 | 11.20 | 7.13 | 71 | 5.96 | 75.0 | 2.03 | clear |
| 1155 | 200 | 16.25 | 11.24 | 7.05 | 71 | 5.89 | 82.8 | 1.78 | clear |
| 1200 | 200 | 16.25 | 11.20 | 7.00 | 70 | 5.98 | 95.1 | 1.62 | clear |
| 1205 | 200 | 16.25 | 10.66 | 6.89 | 70 | 5.34 | 116.8 | 1.99 | clear |
| 1210 | 200 | 16.25 | 10.67 | 6.89 | 71 | 5.67 | 117.9 | 1.44 | clear |
| 1215 | 200 | 16.25 | 10.62 | 6.90 | 70 | 6.33 | 117.9 | 1.21 | clear |
| 1220 | 200 | 16.25 | 10.85 | 6.93 | 70 | 6.31 | 122.5 | 1.30 | clear |
| 1225 | 200 | 16.25 | 10.84 | 6.93 | 70 | 6.07 | 122.8 | 1.27 | clear |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): Y
Filter Size: 0.45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Flood 11/14/17
**Signature** Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHP-2016-1B

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/14/17
Location: Fort Devens Massachusetts Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 16.6 |
| Depth to bottom (ft BTOR) | 86.48 |
| Screen Interval (ft BTOR) | 77.56-87.56 |
| Total volume purged (gal) | 3 |

**Sampling Type**

Purging Method Geotech Tubing type Teflon Dedicated pump (Y/N) N
Purge start/stop time 1335/1500 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) YSI 650 MDS: 08J100370

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm[c]) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1400 | 200 | 17.15 | 9.90 | 6.92 | 212 | 3.41 | 50.4 | 1.95 | clear |
| 1405 | 200 | 17.15 | 9.88 | 7.06 | 219 | 1.57 | 12.7 | 2.58 | clear |
| 1410 | 200 | 17.15 | 9.87 | 7.17 | 228 | 1.36 | -11.3 | 4.03 | clear |
| 1415 | 200 | 17.15 | 9.83 | 7.25 | 245 | 1.13 | -24.2 | 14.8 | clear |
| 1420 | 200 | 17.15 | 9.74 | 7.27 | 261 | 1.29 | -32.1 | 13.5 | clear |
| 1425 | 200 | 17.15 | 9.75 | 7.29 | 264 | 1.39 | -35.2 | 14.1 | clear |
| 1430 | 200 | 17.15 | 9.81 | 7.31 | 270 | 1.34 | -38.3 | 5.96 | clear |
| 1435 | 200 | 17.15 | 9.83 | 7.35 | 273 | 1.43 | -40.8 | 5.50 | clear |
| 1440 | 200 | 17.15 | 9.82 | 7.35 | 273 | 1.35 | -41.9 | 2.79 | clear |
| 1445 | 200 | 17.15 | 9.80 | 7.36 | 280 | 1.47 | -46.0 | 2.65 | clear |
| 1450 | 200 | 17.15 | 9.81 | 7.35 | 281 | 1.48 | -46.7 | 3.07 | clear |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: 0.45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N)

**Comments**

Signature: [signature] Date: 11/14/17

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-15

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/15/17
Location: Fort Devens Massachusetts Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft BTOR) | 18.38 |
| Depth to bottom (ft BTOR) | 26.53 |
| Screen Interval (ft BTOR) | 15.40 → 25.40 |
| Total volume purged (gal) | 6.0 |

**Sampling Type**

Purging Method: peristaltic Tubing type: poly Dedicated pump (Y/N): Tubing
Purge start/stop time: 840/905 Tubing diameter: 1/4" Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 840 | 200 | 19.08 | 13.16 | 6.28 | 277 | 0.58 | 28.2 | 4.95 | clear |
| 845 | ↓ | ↓ | 13.23 | 6.36 | 274 | 0.47 | 17.2 | 4.87 | ↓ |
| 850 | ↓ | ↓ | 13.29 | 6.34 | 273 | 0.39 | 14.0 | 4.83 | ↓ |
| 855 | ↓ | ↓ | 13.22 | 6.37 | 273 | 0.34 | 13.5 | 4.80 | ↓ |
| 900 | ↓ | ↓ | 13.25 | 6.36 | 271 | 0.34 | 13.2 | 4.79 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): Y MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: SHL-DUP-11-Fall17 @ 910

Dedicated Tubing: (Y/N) Y

**Comments** SHL-15-Fall17 @ 905 Fall first

Signature

11/15/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-93-18B

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/15/17
Location: Fort Devens Massachusetts Sampler: VLK

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft BTOR) | 17.91 |
| Depth to bottom (ft BTOR) | 91.23 |
| Screen Interval (ft BTOR) | 80.60 → 90.60 |
| Total volume purged (gal) | 6.0 |

**Sampling Type**

Purging Method: geotech Tubing type: poly Dedicated pump (Y/N): Tubing
Purge start/stop time: 1015/1045 Tubing diameter: 1/4" Air source: ~~Y~~ N/A
Field Instrument (Model/S/N): YSI 556 MPS 15 100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1015 | 200 | 18.25 | 10.79 | 6.72 | 328 | 0.91 | 72.6 | 1.17 | clear |
| 1020 | ↓ | ↓ | 11.0 | 6.72 | 327 | 0.87 | 76.9 | 1.09 | ↓ |
| 1025 | | | 11.03 | 6.73 | 325 | 0.73 | 84.1 | 0.90 | |
| 1030 | | | 11.0 | 6.73 | 323 | 0.65 | 86.3 | 0.87 | |
| 1035 | | | 10.98 | 6.73 | 322 | 0.64 | 87.2 | 0.86 | |
| 1040 | | | 10.97 | 6.74 | 320 | 0.62 | 88.1 | 0.84 | |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Y

**Comments** SHM-93-18B - Fall 17 @ 1225 Fall 1st

**Signature** 11/15/17 Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-7

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/15/17
Location: Fort Devens Massachusetts Sampler: WGA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | | ✓ | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 17.19 |
| Depth to bottom (ft BTOR) | 23.74 |
| Screen Interval (ft BTOR) | 12.55 → 22.55 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: peristaltic Tubing type: poly Dedicated pump (Y/N): Tubing
Purge start/stop time: 1150/1225 Tubing diameter: 1/4" Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 11J100112 / Lamotte 2020 WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1150 | 200 | 16.85 | 11.67 | 6.73 | 158 | 1.02 | 83.4 | 10.31 | clear |
| 1155 | ↓ | ↓ | 11.80 | 6.70 | 158 | 0.88 | 84.9 | 9.01 | ↓ |
| 1200 | ↓ | ↓ | 11.72 | 6.69 | 158 | 0.67 | 86.7 | 7.67 | ↓ |
| 1205 | ↓ | ↓ | 11.74 | 6.69 | 159 | 0.43 | 86.9 | 7.01 | ↓ |
| 1210 | ↓ | ↓ | 11.76 | 6.76 | 160 | 0.41 | 87.4 | 6.23 | ↓ |
| 1215 | ↓ | ↓ | 11.77 | 6.70 | 161 | 0.39 | 87.8 | 6.19 | ↓ |
| 1220 | ↓ | ↓ | 11.79 | 6.70 | 162 | 0.39 | 87.9 | 6.18 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: 1.45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Y

**Comments** SHL-7 - Fall 17 @ 1225 Full list

Signature

11/15/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-PZ -16-03A

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/15/17
Location: Fort Devens Massachusetts Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 12.13 |
| Depth to bottom (ft BTOR) | 27.50 |
| Screen Interval (ft BTOR) | 22.05 - 27.05 |
| Total volume purged (gal) | 3 |

**Sampling Type**

Purging Method Geotech Tubing type Poly Dedicated pump (Y/N) N
Purge start/stop time 0815/0930 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) ~~YSI 650 MDS: 08J100320~~

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0840 | 200 | 12.13 | 8.34 | 8.59 | 261 | 3.24 | 81.9 | 2.63 | clear |
| 0845 | 200 | 12.13 | 8.50 | 7.99 | 202 | 2.25 | 7.0 | 2.25 | clear |
| 0850 | 200 | 12.13 | 8.50 | 7.89 | 187 | 1.75 | -14.1 | 2.30 | clear |
| 0855 | 200 | 12.13 | 8.49 | 7.85 | 176 | 2.03 | -26.0 | 1.82 | clear |
| 0900 | 200 | 12.13 | 8.51 | 7.90 | 174 | 1.93 | -30.4 | 2.93 | clear |
| 0905 | 200 | 12.13 | 8.45 | 7.91 | 171 | 2.01 | -31.5 | 2.29 | clear |
| 0910 | 200 | 12.13 | 8.49 | 7.96 | 171 | 1.87 | -31.4 | 1.89 | clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: 0.45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Flood 11/15/17
**Signature** Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-PZ-16-03B

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/15/17
Location: Fort Devens Massachusetts Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 11.34 |
| Depth to bottom (ft BTOR) | 87.90 |
| Screen Interval (ft BTOR) | 82.05 - 87.05 |
| Total volume purged (gal) | 3 |

**Sampling Type**

Purging Method Geotech Tubing type Teflon Dedicated pump (Y/N) N
Purge start/stop time 0945/1050 Tubing diameter 1/4" Air source N/A
YSI 650 MDS: 08J100320 Field Instrument (Model/S/N)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1010 | 200 | 11.34 | 8.26 | 7.75 | 480 | 2.79 | -19.2 | 1.91 | clear |
| 1015 | 200 | 11.34 | 8.64 | 7.80 | 486 | 2.72 | -28.3 | 1.75 | clear |
| 1020 | 200 | 11.34 | 8.77 | 7.82 | 497 | 2.60 | -33.3 | 1.36 | clear |
| 1025 | 200 | 11.34 | 8.85 | 7.83 | 504 | 2.53 | -38.3 | 1.55 | clear |
| 1030 | 200 | 11.34 | 8.87 | 7.85 | 508 | 2.51 | -42.1 | 1.26 | clear |
| 1035 | 200 | 11.34 | 8.91 | 7.87 | 512 | 2.51 | -45.4 | 1.15 | clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: 0.45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Flood 11/15/17
**Signature** Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHL-9

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/15/17
Location: Fort Devens Massachusetts Sampler: DMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 10.3 |
| Depth to bottom (ft BTOR) | 26.37 |
| Screen Interval (ft BTOR) | 16.23 – 26.23 |
| Total volume purged (gal) | 5 |

**Sampling Type**

Purging Method Geotech Tubing type Teflon Dedicated pump (Y/N) N
Purge start/stop time 1105/1300 Tubing diameter 3/8" Air source N/A
Field Instrument (Model/S/N) YSI 650 MDS: 08J100820

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1130 | 200 | 10.3 | 10.23 | 8.30 | 395 | 2.63 | -1.7 | 58 | clear/light orange |
| 1135 | 200 | 10.3 | 10.19 | 8.08 | 394 | 1.67 | 4.9 | 55.3 | light orange |
| 1140 | 200 | 10.3 | 10.20 | 7.92 | 395 | 1.64 | 8.2 | 23.7 | clear |
| 1145 | 200 | 10.3 | 10.15 | 7.89 | 397 | 1.71 | 8.0 | 13.8 | clear |
| 1150 | 200 | 10.3 | 10.16 | 7.88 | 401 | 2.06 | 7.5 | 8.87 | clear |
| 1155 | 200 | 10.3 | 10.23 | 7.89 | 405 | 1.96 | 7.0 | 12.5 | clear |
| 1205 | 200 | 10.3 | 10.27 | 7.90 | 411 | 1.64 | 5.1 | 8.24 | clear |
| 1210 | 200 | 10.3 | 10.27 | 7.89 | 415 | 1.72 | 4.8 | 7.42 | clear |
| 1215 | 200 | 10.3 | 10.25 | 7.89 | 416 | 1.93 | 4.7 | 5.60 | clear |
| 1220 | 200 | 10.3 | 10.20 | 7.89 | 417 | 1.94 | 4.7 | 4.21 | clear |
| 1225 | 200 | 10.3 | 10.05 | 7.89 | 418 | 1.99 | 4.6 | 4.98 | clear |
| 1230 | 200 | 10.3 | 10.17 | 7.89 | 418 | 2.06 | 4.9 | 4.77 | clear |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): Y MS/MSD (Y/N): N
Filter Size: 0.45 Dup ID/Time:

Dedicated Tubing: (Y/N)

**Comments** Water was very brown/orange for first ~20 min of purging.

Jenifer Flood
**Signature**

11/15/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHM-13-05

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/16/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | ✓ |
| Locked (stickup wells) | | | ✓ |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 15.87 |
| Depth to bottom (ft BTOR) | 86.06 |
| Screen Interval (ft BTOR) | 74.75 → 84.75 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 855/925
Tubing type: teflon lined poly
Tubing diameter: 3/8"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): ~

YSI 556 MPS 11J100112 / LaMotte 2020 GE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 855 | 200 | 16.61 | 10.93 | 6.74 | 542 | 0.70 | -32.6 | 6.90 | clear |
| 900 | ↓ | ↓ | 10.71 | 6.81 | 600 | 0.67 | -38.7 | 4.13 | ↓ |
| 905 | ↓ | ↓ | 10.75 | 6.93 | 663 | 0.51 | -44.1 | 3.97 | ↓ |
| 910 | ↓ | ↓ | 10.73 | 6.97 | 659 | 0.41 | -45.9 | 3.30 | ↓ |
| 915 | ↓ | ↓ | 10.72 | 6.98 | 657 | 0.38 | -46.5 | 3.21 | ↓ |
| 920 | ↓ | ↓ | 10.71 | 6.98 | 656 | 0.37 | -46.9 | 3.20 | ↓ |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) yes

**Comments** SHM-13-05-Fall17 @ 925 Full list

[signature]
**Signature**

11/16/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-4A

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/16/17
Location: Fort Devens Massachusetts Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 18.64 |
| Depth to bottom (ft BTOR) | 32.74 |
| Screen Interval (ft BTOR) | 27.40-32.40 |
| Total volume purged (gal) | 3.5 |

**Sampling Type**

Purging Method Geotech Tubing type Poly Dedicated pump (Y/N) N
Purge start/stop time 0830/0995 Tubing diameter "A" Air source N/A
Field Instrument (Model/S/N) ——

YSI 650 MDS: 08J100320

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0850 | 200 | 18.64 | 7.01 | 9.14 | 162 | 8.32 | 201.3 | 37.4 | clear |
| 0855 | 200 | 18.64 | 7.16 | 9.07 | 122 | 2.62 | 138.5 | 37.9 | clear |
| 0900 | 200 | 18.64 | 7.28 | 8.85 | 106 | 2.13 | 82.3 | 33.3 | clear |
| 0905 | 200 | 18.64 | 7.25 | 8.71 | 101 | 2.04 | 59.1 | 28.5 | clear |
| 0910 | 200 | 18.64 | 7.19 | 8.57 | 96 | 1.94 | 32.1 | 27.8 | clear |
| 0915 | 200 | 18.64 | 7.16 | 8.47 | 95 | 1.96 | 15.3 | 24.6 | clear |
| 0920 | 200 | 18.64 | 7.13 | 8.41 | 94 | 1.94 | 4.3 | 24.9 | clear |
| 0925 | 200 | 18.64 | 7.16 | 8.35 | 93 | 1.94 | 0.0 | 21.3 | clear |
| 0930 | 200 | 18.64 | 7.18 | 8.31 | 92 | 2.09 | -3.2 | 21.6 | clear |
| 0935 | 200 | 18.64 | 7.19 | 8.30 | 91 | 2.08 | -6.5 | 20.9 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: 0.45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N)

**Comments**

Signature: [signature] Date: 11/16/17

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-4B

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/16/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 18.1 |
| Depth to bottom (ft BTOR) | 92.85 |
| Screen Interval (ft BTOR) | 87.18 - 92.18 |
| Total volume purged (gal) | 3 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 0955 / 1100
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): —

YSI 650 MDS: 08J100320

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1015 | 200 | 18.1 | 7.44 | 7.71 | 505 | 4.42 | -13.0 | 4.18 | clear |
| 1020 | 200 | 18.1 | 7.33 | 7.72 | 513 | 3.10 | -31.6 | 2.87 | clear |
| 1025 | 200 | 18.1 | 7.50 | 7.76 | 517 | 3.42 | -46.8 | 2.52 | clear |
| 1030 | 200 | 18.1 | 7.59 | 7.77 | 522 | 3.64 | -52.7 | 2.41 | clear |
| 1035 | 200 | 18.1 | 7.66 | 7.77 | 523 | 3.66 | -54.9 | 2.29 | clear |
| 1040 | 200 | 18.1 | 7.68 | 7.79 | 524 | 3.76 | -58.9 | 2.65 | clear |
| | | | | | | | | | |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): Y
Dup ID/Time: 1050
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Signature

11/16/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-5A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/16/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 15.2 |
| Depth to bottom (ft BTOR) | 37.76 |
| Screen Interval (ft BTOR) | 27.13 - 32.13 |
| Total volume purged (gal) | 3.5 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 1130/1240
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): ——

YSI 650 MDS: 08J100320

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1155 | 200 | 15.39 | 8.34 | 8.28 | 182 | 1.65 | -56.5 | 6.13 | clear |
| 1200 | 200 | 15.39 | 8.39 | 8.24 | 178 | 1.74 | -56.3 | 6.70 | clear |
| 1205 | 200 | 15.39 | 8.35 | 8.19 | 175 | 1.55 | -55.6 | 5.56 | clear |
| 1210 | 200 | 15.39 | 8.33 | 8.19 | 174 | 1.67 | -56.2 | 5.61 | clear |
| 1215 | 200 | 15.39 | 8.28 | 8.19 | 174 | 1.54 | -59.6 | 5.51 | clear |
| 1220 | 200 | 15.39 | 8.19 | 8.19 | 174 | 1.60 | -59.4 | 5.74 | clear |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Signature

11/16/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-10-05A

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/16/17
Location: Fort Devens Massachusetts Sampler: MA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | |
| Locked (stickup wells) | | | ✓ |

**Well Information**

| | |
|---|---|
| Diameter | 1.5" |
| Material | PVC |
| Depth to water (ft BTOR) | 24.73 |
| Depth to bottom (ft BTOR) | 59.90 |
| Screen Interval (ft BTOR) | 49.68 → 59.68 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method peristaltic Tubing type poly Dedicated pump (Y/N) Tubing
Purge start/stop time 1025/1050 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) YSI 556MPS 11J100112 / LaMotte 2020WE 8240-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1025 | 200 | 25.30 | 11.94 | 6.74 | 237 | 1.92 | 145.2 | 9.21 | Clear |
| 1030 | ↓ | ↓ | 11.87 | 6.69 | 237 | 1.79 | 149.7 | 4.40 | ↓ |
| 1035 | ↓ | ↓ | 11.99 | 6.68 | 239 | 1.66 | 158.1 | 4.21 | ↓ |
| 1040 | ↓ | ↓ | 11.93 | 6.68 | 240 | 1.63 | 161.0 | 4.19 | ↓ |
| 1045 | ↓ | ↓ | 11.92 | 6.68 | 242 | 1.60 | 161.9 | 4.17 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Y

**Comments** SHM-10-05A- Fall17 @ 1030

**Signature** 11/16/17 **Date**

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-10-06

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/16/17
Location: Fort Devens Massachusetts Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 18.60 |
| Depth to bottom (ft BTOR) | 81.70 |
| Screen Interval (ft BTOR) | 72.38 → 82.38 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech Tubing type: Poly Dedicated pump (Y/N): Tubing
Purge start/stop time: 1140/1210 Tubing diameter: 1/4" Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 11J100 112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1140 | 200 | 19.17 | 9.67 | 6.87 | 474 | 0.52 | -82.0 | 3.90 | Clear |
| 1145 | ↓ | ↓ | 9.69 | 6.88 | 478 | 0.43 | -81.2 | 3.80 | ↓ |
| 1150 | ↓ | ↓ | 9.71 | 6.88 | 479 | 0.36 | -80.1 | 3.71 | ↓ |
| 1155 | ↓ | ↓ | 9.74 | 6.89 | 480 | 0.34 | -79.9 | 3.60 | ↓ |
| 1200 | ↓ | ↓ | 9.73 | 6.89 | 481 | 0.33 | -79.6 | 3.59 | ↓ |
| 1205 | ↓ | ↓ | 9.72 | 6.90 | 483 | 0.31 | -79.1 | 3.57 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): Y MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Y

**Comments** SHM-10-06-Fall17 @1210 Full list

**Signature** 11/16/17 **Date**

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** EPA-P2-2012-7A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/17/17
Sampler: VA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | |
| Locked (stickup wells) | | | ✓ |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 22.12 |
| Depth to bottom (ft BTOR) | 29.33 |
| Screen Interval (ft BTOR) | 24.74 → 29.74 |
| Total volume purged (gal) | 3.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 850/915
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): —

YSI 556MPS 11T100112 / Mach 2020VE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 850 | 200 | 22.40 | 10.42 | 6.39 | 546 | 3.25 | 150.1 | 11.10 | clear |
| 855 | ↓ | ↓ | 10.20 | 6.40 | 547 | 3.14 | 154.7 | 6.66 | ↓ |
| 900 | ↓ | ↓ | 10.14 | 6.40 | 548 | 3.07 | 157.4 | 4.59 | ↓ |
| 905 | ↓ | ↓ | 10.18 | 6.39 | 549 | 3.02 | 160.1 | 4.54 | ↓ |
| 910 | ↓ | ↓ | 10.19 | 6.41 | 549 | 3.01 | 161.3 | 4.52 | ↓ |
| | | | | | | | | | |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** EPA-P2-2012-7A-Fall17 @ 915 Full list

[signature]
**Signature**

11/17/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** EPA-P2-2012-7B

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/17/17
Location: Fort Devens Massachusetts Sampler: MG

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | |
| Locked (stickup wells) | | | ✓ |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 21.87 |
| Depth to bottom (ft BTOR) | 64.28 |
| Screen Interval (ft BTOR) | 52.75 → 64.75 |
| Total volume purged (gal) | 3.0 |

**Sampling Type**

Purging Method geotech Tubing type poly Dedicated pump (Y/N) Tubing
Purge start/stop time 950/1030 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) —
YSI 556 MPS 11J100112 / Lamotte 2020 WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 950 | 200 | 22.40 | 10.16 | 6.81 | 147 | 0.65 | -63.9 | 4.71 | Clear |
| 955 | ↓ | ↓ | 10.13 | 6.87 | 144 | 0.51 | -69.1 | 4.31 | ↓ |
| 1000 | ↓ | ↓ | 10.00 | 6.87 | 142 | 0.47 | -74.8 | 4.24 | ↓ |
| 1005 | ↓ | ↓ | 10.00 | 6.88 | 142 | 0.38 | -90.1 | 4.20 | ↓ |
| 1010 | ↓ | ↓ | 9.97 | 6.91 | 141 | 0.37 | -91.2 | 4.00 | ↓ |
| 1015 | ↓ | ↓ | 9.96 | 6.92 | 140 | 0.35 | -93.8 | 3.91 | ↓ |
| 1020 | ↓ | ↓ | 9.97 | 6.92 | 140 | 0.33 | -93.9 | 3.90 | ↓ |
| 1025 | ↓ | ↓ | 9.99 | 6.91 | 140 | 0.33 | -94.1 | 3.89 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Y

**Comments** EPA-P2-2012-7B- Fall17 @1205 Full list

**Signature** **Date** 11/17/17

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SMM- 10-16

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/17/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 7.13 |
| Depth to bottom (ft BTOR) | 87.22 |
| Screen Interval (ft BTOR) | 77.51 → 87.51 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1130/1205
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 11J100112 / LaMotte 2020 WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1130 | 200 | 7.68 | 9.09 | 6.91 | 420 | 0.78 | -67.0 | 13.1 | clear |
| 1135 | ↓ | ↓ | 9.07 | 6.90 | 423 | 0.62 | -69.1 | 6.00 | ↓ |
| 1140 | ↓ | ↓ | 9.14 | 6.92 | 424 | 0.41 | -72.1 | 4.93 | ↓ |
| 1145 | ↓ | ↓ | 9.25 | 6.95 | 426 | 0.35 | -74.7 | 4.90 | ↓ |
| 1150 | ↓ | ↓ | 9.27 | 6.94 | 427 | 0.33 | -75.0 | 4.77 | ↓ |
| 1155 | ↓ | ↓ | 9.28 | 6.94 | 428 | 0.31 | -75.3 | 4.75 | ↓ |
| 1200 | ↓ | ↓ | 9.30 | 6.93 | 429 | 0.30 | -75.5 | 4.74 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): Y
Dup ID/Time: SML-DUP-08-Fall17 @ 1210
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SMM-10-16-Fall17 @ 1205

[signature]
**Signature**

11/17/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-07-05X

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/17/17
Sampler: L. Klosterman

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | ✓ | |
| Locked (stickup wells) | | | ✓ |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 13.35 |
| Depth to bottom (ft BTOR) | 65.2' |
| Screen Interval (ft BTOR) | 54-64' |
| Total volume purged (gal) | 2.0 |

**Sampling Type**

Purging Method: Peristaltic
Purge start/stop time: 0916/1005
Sampling Start: 1005
Tubing type: Teflon lined Poly
Tubing diameter: 0.25
Sampling End: 1018
Dedicated pump (Y/N): .
Air source: — N/A
Field Instrument (Model/S/N): YSI 650 MDS 08J100320

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0930 | 200 | 19.62 | 9.54 | 7.20 | 497 | 5.86 | -86.4 | 4.66 | clear |
| 0935 | 200 | 20.85 | 9.58 | 7.19 | 492 | 1.85 | -94.8 | 4.19 | clear |
| 0940 | 150 | 21.60 | 9.57 | 7.17 | 491 | 0.72 | -97.7 | 5.15 | clear |
| 0945 | 125 | 22.35 | 9.50 | 7.18 | 481 | 0.38 | -100.2 | 3.17 | clear |
| 0950 | 125 | 23.42 | 9.60 | 7.20 | 479 | 0.31 | -105.7 | 2.52 | clear |
| 0955 | 125 | 24.26 | 9.49 | 7.19 | 478 | 0.14 | -106.6 | 2.60 | clear |
| 1000 | 125 | 25.60 | 9.50 | 7.18 | 473 | 0.19 | -106.2 | 2.80 | clear |
| 1005 | 125 | 26.05 | 9.48 | 7.17 | 472 | 0.18 | -106.3 | 2.85 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45 µm
Duplicate (Y/N): N
Dup ID/Time:
MS/MSD (Y/N): N
Collected SHM-07-05X @ 1005
Dedicated Tubing: (Y/N) N

**Comments** DTW would not stabilize even as flow rate was reduced. Two tubing volumes were removed at minimum.

Lynne Klosterman
**Signature**

11/17/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-05-40X

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/17/17
Sampler: L. Klosterman

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | ✓ | |
| Locked (stickup wells) | | | ✓ |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 12.52 |
| Depth to bottom (ft BTOR) | 33.2 |
| Screen Interval (ft BTOR) | 32-34 |
| Total volume purged (gal) | 2.0 |

**Sampling Type**

Purging Method: Peristaltic
Purge start/stop time: 1028/1130
Tubing type: LDPE-Teflon lined
Tubing diameter: 0.25
Dedicated ~~pump~~ Tubing (Y/N):
Air source: N/A
Field Instrument (Model/S/N): YSI 650 MDS 08J100320
Sample Start: 1130 Sample End: 1146

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1055 | 150 | 14.42 | 9.85 | 6.86 | 195 | 0.01 | -36.5 | 13.57 | clear |
| 1100 | 150 | 14.40 | 9.87 | 6.75 | 244 | 0.17 | -46.9 | 10.56 | clear |
| 1105 | 150 | 14.40 | 9.92 | 6.70 | 267 | 0.12 | -48.9 | 7.04 | clear |
| 1110 | 150 | 14.40 | 10.01 | 6.70 | 291 | 0.21 | -53.1 | 5.35 | clear |
| 1115 | 150 | 14.40 | 9.72 | 6.71 | 317 | 0.07 | -58.8 | 4.89 | clear |
| 1120 | 150 | 14.40 | 9.59 | 6.71 | 326 | 0.18 | -60.7 | 4.26 | clear |
| 1125 | 150 | 14.40 | 9.56 | 6.72 | 330 | 0.21 | -64.3 | 3.75 | clear |
| 1130 | 150 | 14.40 | 9.60 | 6.73 | 331 | 0.20 | -66.1 | 3.45 | clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

Collected Sample at 1130

**Sampling Details**

Field Filtered (Y/N): Y
Duplicate (Y/N): Y SHL-Dup-10
MS/MSD (Y/N): N
Filter Size: 0.45 µm
Dup ID/Time: 1145 / SHL-Dup-10

Dedicated Tubing: (Y/N)

**Comments** Purged 1.0 gal before initial reading due to very turbid conditions.

Lynn Klosterman
**Signature**

11/17/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-07-03

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/17/17
Location: Fort Devens Massachusetts Sampler: L. Klosterman

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | ✓ | |
| Locked (stickup wells) | | | ✓ |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 19.64 |
| Depth to bottom (ft BTOR) | 33.3 |
| Screen Interval (ft BTOR) | 25-35' |
| Total volume purged (gal) | 2.0 |

**Sampling Type**

Purging Method Peristaltic Tubing type Poly - Teflon lined Dedicated pump (Y/N)
Purge start/stop time 1213/1305 Tubing diameter 0.25 Air source N/A
Sample Start 1305 Sample End 1320 Field Instrument (Model/S/N) YSI 650 MDS 08J100320

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1225 | 125 | 20.50 | 10.30 | 6.46 | 219 | 0.16 | 43.8 | 35.3 | cloudy |
| 1230 | 125 | 20.28 | 10.08 | 6.30 | 292 | 0.06 | 50.6 | 31.0 | " |
| 1235 | 125 | 20.22 | 10.09 | 6.20 | 351 | 0.32 | 52.6 | 23.1 | " |
| 1240 | 125 | 20.20 | 9.98 | 6.14 | 386 | 0.66 | 53.7 | 17.7 | clear |
| 1245 | 125 | 20.21 | 9.99 | 6.14 | 405 | 0.34 | 53.8 | 16.9 | clear |
| 1250 | 125 | 20.20 | 10.01 | 6.12 | 418 | 0.62 | 55.7 | 12.2 | clear |
| 1255 | 125 | 20.19 | 10.09 | 6.10 | 430 | 0.64 | 57.1 | 11.6 | clear |
| 1300 | 125 | 20.20 | 10.11 | 6.11 | 431 | 0.62 | 57.7 | 11.26 | clear |
| 1305 | 125 | 20.20 | 10.11 | 6.09 | 435 | 0.60 | 59.4 | 11.15 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Duplicate (Y/N): MS/MSD (Y/N):
Filter Size: 0.45 µm Dup ID/Time: N/A Collected Sample at 1305

Dedicated Tubing: (Y/N)

**Comments**

Lynne Klosterman
**Signature**

11/17/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-5B

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/20/17
Location: Fort Devens Massachusetts Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 15.38 |
| Depth to bottom (ft BTOR) | 92.90 |
| Screen Interval (ft BTOR) | 87.07-92.07 |
| Total volume purged (gal) | 3 |

**Sampling Type**

Purging Method Geotech Tubing type Poly Dedicated pump (Y/N) N
Purge start/stop time 0835 0940 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) ____

YSI 650 MDS: 08J100320

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0900 | 200 | 15.38 | 8.81 | 9.41 | 561 | 21.89 | 117.8 | 7.17 | clear |
| 0905 | 200 | 15.38 | 8.30 | 8.78 | 528 | 79.04 | -42.0 | 4.07 | clear |
| 0910 | 200 | 15.38 | 9.05 | 8.56 | 524 | 86.86 | -66.2 | 3.30 | clear |
| 0915 | 200 | 15.38 | 9.12 | 8.45 | 520 | 86.64 | -67.5 | 2.73 | clear |
| 0920 | 200 | 15.38 | 9.11 | 8.44 | 518 | 86.67 | -68.1 | 2.60 | clear |
| 0925 | 200 | 15.38 | 9.08 | 8.44 | 518 | 86.76 | -64.1 | 1.96 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: 0.45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N)

**Comments** ____

Jennifer Flood
**Signature**

11/20/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHP-2016-2A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/20/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 14.5 |
| Depth to bottom (ft BTOR) | 27.39 |
| Screen Interval (ft BTOR) | 22.20 - 27.20 |
| Total volume purged (gal) | 3 |

**Sampling Type**

Purging Method Geotech
Purge start/stop time 0955/1110
Tubing type Poly
Tubing diameter 1/4"
Dedicated pump (Y/N) N
Air source N/A
Field Instrument (Model/S/N) YSI 650 MDS: 08J100320

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1015 | 200 | 14.5 | 9.38 | 9.69 | 262 | 85.74 | -260.8 | 25.8 | clear |
| 1020 | 200 | 14.5 | 9.26 | 10.66 | 240 | 86.23 | -273.4 | 22.2 | clear |
| 1025 | 200 | 14.5 | 9.27 | 11.02 | 230 | 86.36 | -265.0 | 20.9 | clear |
| 1030 | 200 | 14.5 | 9.36 | 11.33 | 221 | 86.05 | -252.6 | 17.6 | clear |
| 1035 | 200 | 14.5 | 9.22 | 11.51 | 217 | 86.61 | -232.0 | 17.4 | clear |
| 1040 | 200 | 14.5 | 9.21 | 11.56 | 214 | 86.51 | -228.2 | 16.7 | clear |
| 1045 | 200 | 14.5 | 9.03 | 11.87 | 211 | 86.95 | -200.8 | 15.7 | clear |
| 1050 | 200 | 14.5 | 9.03 | 11.85 | 200 | 84.40 | -198.3 | 13.1 | clear |
| 1055 | 200 | 14.5 | 9.01 | 11.88 | 199 | 81.22 | -197.3 | 13.1 | clear |
| 1100 | 200 | 14.5 | 9.03 | 11.91 | 197 | 77.72 | -196.3 | 13.2 | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Leard
**Signature**

11/20/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-2B

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/20/17
Location: Fort Devens Massachusetts Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 14.3 |
| Depth to bottom (ft BTOR) | 87.90 |
| Screen Interval (ft BTOR) | 82.22 - 87.22 |
| Total volume purged (gal) | 4 |

**Sampling Type**

Purging Method Geotech Tubing type Poly Dedicated pump (Y/N) N
Purge start/stop time 1120/1250 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) ——

YSI 650 MDS: 08J100320

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1140 | 200 | 14.3 | 8.05 | 11.32 | 448 | 59.84 | -88.6 | 4.31 | clear |
| 1145 | 200 | 14.3 | 8.13 | 10.87 | 500 | 59.53 | -92.2 | 2.43 | clear |
| 1150 | 200 | 14.3 | 8.11 | 9.72 | 533 | 46.89 | -64.1 | 1.76 | clear |
| 1155 | 200 | 14.3 | 8.17 | 9.60 | 532 | 47.49 | -64.1 | 2.06 | clear |
| 1200 | 200 | 14.3 | 8.07 | 9.05 | 533 | 39.89 | -65.2 | 2.64 | clear |
| 1205 | 200 | 14.3 | 8.08 | 9.02 | 532 | 40.39 | -65.4 | 2.04 | clear |
| 1210 | 200 | 14.3 | 8.12 | 8.90 | 532 | 39.30 | -65.7 | 2.14 | clear |
| 1215 | 200 | 14.3 | 8.14 | 8.91 | 531 | 34.59 | -65.9 | 2.05 | clear |
| 1220 | 200 | 14.3 | 8.25 | 8.85 | 530 | 26.52 | -69.4 | 2.54 | clear |
| 1225 | 200 | 14.3 | 8.26 | 8.78 | 530 | 26.21 | -69.7 | 2.25 | clear |
| 1230 | 200 | 14.3 | 8.30 | 8.76 | 528 | 25.81 | -69.9 | 2.27 | clear |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: 0.45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N)

**Comments**

Jeffrey Flood
**Signature**

11/20/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHM-05-41C

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/20/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | |
| Locked (stickup wells) | | | ✓ |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 10.53 |
| Depth to bottom (ft BTOR) | 87.82 |
| Screen Interval (ft BTOR) | 92.66 → 97.66 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 855/920
Tubing type: 3/8" poly
Tubing diameter: 3/8"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): –

YSI 556MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 855 | 200 | 11.13 | 9.79 | 7.07 | 586 | 0.70 | -101.6 | 13.1 | Clear |
| 900 | ↓ | ↓ | 9.71 | 7.06 | 570 | 0.59 | -99.9 | 8.21 | ↓ |
| 905 | ↓ | ↓ | 9.69 | 7.05 | 563 | 0.41 | -98.3 | 6.66 | ↓ |
| 910 | ↓ | ↓ | 9.67 | 7.05 | 560 | 0.40 | -98.1 | 6.63 | ↓ |
| 915 | ↓ | ↓ | 9.66 | 7.05 | 559 | 0.39 | -97.1 | 6.62 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): Y
MS/MSD

Dedicated Tubing: (Y/N) Y

**Comments** SHM-05-41C - Fall 17 @ 920 Full list

[signature]
**Signature**

11/20/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMM-05-41A

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/20/17
Location: Fort Devens Massachusetts Sampler: KA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | |
| Locked (stickup wells) | | | ✓ |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 10.42 |
| Depth to bottom (ft BTOR) | 40.45 |
| Screen Interval (ft BTOR) | 41.76 → 43.76 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method geotech Tubing type poly Dedicated pump (Y/N) Tubing
Purge start/stop time 1022/1050 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) YSI 556 MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1025 1027 | 200 | 11.06 | 9.16 | 6.81 | 151 | 0.74 | 57.8 | 3.97 | clear |
| 1030 1027 | | | 9.40 | 6.73 | 147 | 0.59 | 46.9 | 3.83 | |
| 1035 1032 | | | 9.38 | 6.74 | 144 | 0.48 | 44.1 | 3.81 | |
| 1040 1037 | | | 9.40 | 6.73 | 143 | 0.47 | 43.7 | 3.80 | |
| 1045 1042 | | | 9.42 | 6.73 | 142 | 0.46 | 43.5 | 3.79 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: 1.45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Y

**Comments** SMM-05-41A - Fall 17 @ 1050 Fall 1st

Signature

11/20/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-05-41B

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/20/17
Location: Fort Devens Massachusetts Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | |
| Locked (stickup wells) | | | ✓ |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 10.25 |
| Depth to bottom (ft BTOR) | 60.87 |
| Screen Interval (ft BTOR) | 61.83 → 63.83 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: geotech Tubing type: poly Dedicated pump (Y/N): Tubing
Purge start/stop time: 1155/1225 Tubing diameter: 1/4" Air source: N/A
Field Instrument (Model/S/N): —
YSI 556 MPS 11J 100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1155 | 200 | 10.71 | 10.15 | 6.84 | 313 | 0.99 | -67.5 | 10.68 | Clear |
| 1200 | ↓ | ↓ | 10.17 | 6.84 | 309 | 0.63 | -67.9 | 8.91 | ↓ |
| 1205 | | | 10.07 | 6.85 | 302 | 0.37 | -68.3 | 7.61 | |
| 1210 | | | 10.09 | 6.86 | 301 | 0.34 | -68.7 | 6.49 | |
| 1215 | | | 10.13 | 6.87 | 300 | 0.33 | -68.8 | 6.47 | |
| 1220 | | | 10.14 | 6.86 | 300 | 0.31 | -69.1 | 6.48 | |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Y

**Comments** SHM-05-41B- Fall 17 @ 1225 Full list

[illegible] 11/20/17
**Signature** Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-10-04

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/21/17
Location: Fort Devens Massachusetts Sampler: MG

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 1.5" |
| Material | PVC |
| Depth to water (ft BTOR) | 5.11 |
| Depth to bottom (ft BTOR) | 64.49 |
| Screen Interval (ft BTOR) | 57.61 → 67.61 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: peristaltic Tubing type: poly Dedicated pump (Y/N): Tubing
Purge start/stop time: 920/950 Tubing diameter: 3/8" Air source: N/A
Field Instrument (Model/S/N): YSI 556MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 920 | 200 | 6.15 | 11.24 | 6.35 | 463 | 0.59 | 138.1 | 1.57 | clear |
| 925 | ↓ | ↓ | 11.24 | 6.35 | 468 | 0.40 | 140.3 | 1.37 | ↓ |
| 930 | | | 11.23 | 6.34 | 471 | 0.31 | 145.1 | 1.31 | |
| 935 | | | 11.27 | 6.33 | 474 | 0.29 | 148.1 | 1.30 | |
| 940 | | | 11.24 | 6.34 | 475 | 0.26 | 150.5 | 1.29 | |
| 945 | | | 11.23 | 6.33 | 473 | 0.26 | 151.2 | 1.28 | |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: 1.45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Tubing Y

**Comments** SHM-10-04-Fall17 @ 950 Full list

Signature

11/21/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-10-03

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/21/17
Location: Fort Devens Massachusetts Sampler: MA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 1.5" |
| Material | PVC |
| Depth to water (ft BTOR) | 24.64 |
| Depth to bottom (ft BTOR) | 69.63 |
| Screen Interval (ft BTOR) | 60.78 → 70.78 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method geopump Tubing type teflon lined poly Dedicated pump (Y/N) N (Added)
Purge start/stop time 1045/1120 Tubing diameter 1/4" Air source N/A
Field Instrument (Model/S/N) YSI 556 MPS 11J100112 / LaMotte 2020 WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1045 | 200 | 26.55 | 11.11 | 6.90 | 1014 | 1.09 | 143.0 | 6.46 | Clear |
| 1050 | ↓ | ↓ | 11.27 | 6.92 | 1054 | 0.83 | 131.3 | 6.09 | ↓ |
| 1055 | ↓ | ↓ | 11.37 | 6.94 | 1099 | 0.63 | 121.7 | 5.29 | ↓ |
| 1100 | ↓ | ↓ | 11.47 | 6.95 | 1127 | 0.58 | 110.1 | 4.93 | ↓ |
| 1105 | ↓ | ↓ | 11.53 | 6.97 | 1156 | 0.55 | 105.6 | 4.91 | ↓ |
| 1110 | ↓ | ↓ | 11.52 | 6.96 | 1159 | 0.53 | 104.2 | 4.90 | ↓ |
| 1115 | ↓ | ↓ | 11.56 | 6.96 | 1162 | 0.52 | 103.1 | 4.87 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N) Added

**Comments** SHM-10-03-Fall17 @ 1120 Fall 1st

Signature

11/21/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-10-08

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/21/17
Location: Fort Devens Massachusetts Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 9.56 |
| Depth to bottom (ft BTOR) | 56.69 |
| Screen Interval (ft BTOR) | 48.50 - 58.50 |
| Total volume purged (gal) | 3 |

**Sampling Type**

Purging Method Geotech Tubing type Poly Dedicated pump (Y/N) N
Purge start/stop time 0855/0950 Tubing diameter 3/8" Air source N/A
Field Instrument (Model/S/N)

YSI 650 MDS: [redacted] 11B101551

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0915 | 200 | 9.56 | 10.53 | 7.43 | 0.982 | 4.29 | 225.1 | 2.05 | clear |
| 0920 | 200 | 9.56 | 10.63 | 7.16 | 0.896 | 1.59 | 215.2 | 2.36 | clear |
| 0925 | 200 | 9.56 | 10.70 | 7.16 | 0.882 | 1.75 | 213.2 | 2.15 | clear |
| 0930 | 200 | 9.56 | 10.81 | 7.18 | 0.880 | 1.38 | 215.5 | 2.13 | clear |
| 0935 | 200 | 9.56 | 10.82 | 7.19 | 0.879 | 1.31 | 217.5 | 2.13 | clear |
| 0940 | 200 | 9.56 | 10.82 | 7.22 | 0.878 | 1.26 | 219.8 | 1.70 | clear |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: 0.45 Dup ID/Time: N/A

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Flood
**Signature**

11/21/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-10-02

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/21/17
Sampler: JMF

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 18.0 |
| Depth to bottom (ft BTOR) | 64.09 |
| Screen Interval (ft BTOR) | 55.84-65.84 |
| Total volume purged (gal) | 3.5 |

**Sampling Type**

Purging Method: Geotech
Purge start/stop time: 1020/1125
Tubing type: Poly
Tubing diameter: 3/8"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): YSI 650 MDS: 11B101551

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1040 | 200 | 18.0 | 11.38 | 7.56 | 0.546 | 1.95 | 210.2 | 2.01 | clear |
| 1045 | 200 | 18.0 | 11.30 | 7.32 | 0.536 | 0.80 | 211.8 | 2.15 | clear |
| 1050 | 200 | 18.0 | 11.30 | 7.37 | 0.532 | 0.97 | 206.8 | 1.73 | clear |
| 1055 | 200 | 18.0 | 11.31 | 7.39 | 0.531 | 0.83 | 205.7 | 1.90 | clear |
| 1100 | 200 | 18.0 | 11.36 | 7.39 | 0.531 | 0.73 | 203.7 | 1.53 | clear |
| 1105 | 200 | 18.0 | 11.37 | 7.38 | 0.531 | 0.78 | 204.2 | 1.89 | clear |
| 1110 | 200 | 18.0 | 11.47 | 7.38 | 0.530 | 0.80 | 202.9 | 1.92 | clear |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Jennifer Flood
**Signature**

11/21/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-13-145

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/27/17
Sampler: MA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ~~✓~~ | ✓ | |

PVC too high

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 3.48 |
| Depth to bottom (ft BTOR) | 17.13 |
| Screen Interval (ft BTOR) | 8.36 → 18.36 |
| Total volume purged (gal) | 3.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 915/945
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): —

YSI 556 MPS 11J600117 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 915 | 200 | 4.07 | 10.66 | 6.66 | 613 | 1.08 | 153.4 | 9.79 | Clear |
| 920 | ↓ | ↓ | 10.77 | 6.64 | 600 | 0.64 | 153.0 | 7.67 | ↓ |
| 925 | | | 10.70 | 6.66 | 586 | 0.48 | 151.3 | 4.83 | |
| 930 | | | 10.69 | 6.69 | 579 | 0.31 | 151.6 | 4.79 | |
| 935 | | | 10.62 | 6.70 | 573 | 0.28 | 152.6 | 4.77 | |
| 940 | ✓ | ✓ | 10.55 | 6.74 | 569 | 0.28 | 155.4 | 4.75 | ✓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) ~~N~~ Y

**Comments** SHM-13-145-Fall17 @ 945 Fall 1st

Signature

11/27/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-B-15

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/27/17
Sampler: MA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 3.01 |
| Depth to bottom (ft BTOR) | 62.41 |
| Screen Interval (ft BTOR) | 54.60 → 64.60 |
| Total volume purged (gal) | 3.0 |

**Sampling Type**

Purging Method: peristaltic
Purge start/stop time: 1035 / 1100
Tubing type: poly
Tubing diameter: 3/8"
Dedicated pump (Y/N): Tubing
Air source: NA
Field Instrument (Model/S/N): YSI 556MPS 11J100112 / LaMotte 2020WE 824-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1035 | 200 | 3.84 | 10.21 | 7.21 | 798 | 1.19 | 20.0 | 11.10 | clear |
| 1040 | ↓ | ↓ | 10.29 | 7.26 | 795 | 0.90 | 14.7 | 8.91 | ↓ |
| 1045 | | | 10.44 | 7.27 | 793 | 0.75 | 13.3 | 7.61 | |
| 1050 | | | 10.47 | 7.27 | 792 | 0.74 | 12.9 | 7.50 | |
| 1055 | | | 10.45 | 7.27 | 790 | 0.74 | 12.7 | 7.52 | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SHM-B-15-Fall17 @ 1100 Fall 1st

**Signature**

11/27/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMM-10-10

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/27/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 9.19 |
| Depth to bottom (ft BTOR) | 66.57 |
| Screen Interval (ft BTOR) | 57.71 → 67.71 |
| Total volume purged (gal) | 3.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1335/1405
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1335 | 200 | 10.82 | 11.52 | 7.43 | 632 | 2.02 | 115.7 | 12.3 | clear |
| 1340 | ↓ | ↓ | 11.49 | 7.42 | 899 | 0.91 | 119.4 | 6.70 | ↓ |
| 1345 | ↓ | ↓ | 11.44 | 7.36 | 995 | 0.41 | 125.6 | 1.90 | ↓ |
| 1350 | ↓ | ↓ | 11.47 | 7.36 | 1021 | 0.35 | 118.9 | 1.45 | ↓ |
| 1355 | ↓ | ↓ | 11.50 | 7.35 | 1036 | 0.32 | 117.7 | 1.43 | ↓ |
| 1400 | ↓ | ↓ | 11.51 | 7.35 | 1040 | 0.31 | 117.6 | 1.39 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SMM-10-10-Fall17 @ 1405 Fall 1st

Signature

11/27/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-13-14D-Fall2017

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/27/17
Sampler: Brett Anchulewitis

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | | | ✓ |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | — |
| Locked (stickup wells) | | ✓ | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 3.65 |
| Depth to bottom (ft BTOR) | 57.21 |
| Screen Interval (ft BTOR) | |
| Total volume purged (gal) | |

**Sampling Type**

Purging Method: Peristaltic
Purge start/stop time: 0900/0945
Tubing type: 1/4" teflon LDPE
Tubing diameter: 1/4"
Dedicated pump (Y/N):
Air source:
Field Instrument (Model/S/N): YSI 650

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0915 | 180 | 3.69 | 10.64 | 7.15 | 0.354 | 4.97 | 175.0 | 9.25 | clear |
| 0920 | 110 | 3.68 | 10.67 | 7.02 | 0.336 | 4.56 | 168.6 | 8.20 | clear |
| 0925 | 100 | 3.68 | 10.68 | 6.96 | 0.335 | 4.39 | 169.8 | 6.88 | clear |
| 0930 | 100 | 3.68 | 10.74 | 6.91 | 0.333 | 4.11 | 168.9 | 6.00 | clear |
| 0935 | 100 | 3.69 | 10.75 | 6.88 | 0.332 | 3.54 | 165.5 | 6.00 | clear |
| 0940 | 100 | 3.69 | 10.75 | 6.87 | 0.333 | 3.29 | 162.9 | 5.57 | clear |
| 0945 | 100 | 3.69 | 10.76 | 6.87 | 0.332 | 3.29 | 159.9 | 5.58 | clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): N
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time:
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments**

Signature

11/27/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-13-03-Fall 2017

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/27/17
Sampler: Brett Archuleitis

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | — | | |
| Concrete Pad intact | | | — |
| PVC casing intact | — | | |
| Well gripper present | — | | |
| Bolts present | | | — |
| Locked (stickup wells) | | — | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 5.43 |
| Depth to bottom (ft BTOR) | 51.0 |
| Screen Interval (ft BTOR) | |
| Total volume purged (gal) | |

**Sampling Type**

Purging Method: Peristaltic
Purge start/stop time: ~~1020~~/1105 1025
Tubing type: Teflon LDPE
Tubing diameter: 1/4"
Dedicated pump (Y/N): ___
Air source: ___
Field Instrument (Model/S/N): YSI 650

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1025 | | 5.43 | | | | | | | |
| 1030 | 150 | 5.44 | 10.65 | 6.68 | 0.460 | 7.71 | 148.9 | 1.92 | clear |
| 1035 | 130 | 5.44 | 10.77 | 6.68 | 0.463 | 4.98 | 136.2 | 1.04 | clear |
| 1040 | 130 | 5.44 | 11.24 | 6.63 | 0.454 | 3.49 | 126.2 | 0.81 | clear |
| 1045 | 130 | 5.44 | 11.32 | 6.61 | 0.453 | 3.33 | 123.3 | 1.11 | clear |
| 1050 | 130 | 5.44 | 11.34 | 6.61 | 0.453 | 3.27 | 121.4 | 1.01 | clear |
| 1055 | 130 | 5.44 | 11.36 | 6.61 | 0.452 | 3.03 | 119.9 | 0.98 | clear |
| 1100 | 130 | 5.44 | 11.37 | 6.61 | 0.452 | 3.02 | 119.3 | 0.97 | clear |
| | | | | | | | | | ~~clear~~ |
| | | | | | | | | | ~~cl~~ |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): ___
Dup ID/Time: ___
MS/MSD (Y/N): MS /MSD

Dedicated Tubing (Y/N): Y

**Comments** ___

Brett Archuleitis
**Signature**

11/27/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-13-02- Fall 2017

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/27/17
Sampler: Brett Archulewski

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | — | | |
| Concrete Pad intact | | | — |
| PVC casing intact | — | | |
| Well gripper present | — | | |
| Bolts present | | | — |
| Locked (stickup wells) | | — | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 12.65 |
| Depth to bottom (ft BTOR) | 22.85 |
| Screen Interval (ft BTOR) | |
| Total volume purged (gal) | |

**Sampling Type**

Purging Method: Peristaltic
Purge start/stop time: 1315/1420
Tubing type: LDPE
Tubing diameter: 1/4"
Dedicated pump (Y/N):
Air source:
Field Instrument (Model/S/N): YSI 650

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1320 | 150 | 12.67 | 10.46 | 7.13 | 0.328 | 8.64 | 72.5 | 0.66 | clear |
| 1325 | 150 | 12.66 | 10.84 | 7.10 | 0.323 | 7.14 | 76.2 | 0.64 | clear |
| 1330 | 120 | 12.66 | 11.00 | 7.07 | 0.321 | 6.58 | 74.8 | 0.45 | clear |
| 1335 | 120 | 12.66 | 10.99 | 7.04 | 0.321 | 6.26 | 75.0 | 1.01 | clear |
| 1340 | 120 | 12.66 | 10.95 | 7.00 | 0.322 | 5.62 | 75.8 | 0.69 | clear |
| 1345 | 120 | 12.66 | 10.92 | 6.96 | 0.324 | 5.43 | 76.6 | 0.50 | clear |
| 1350 | 120 | 12.66 | 10.92 | 6.89 | 0.343 | 4.56 | 78.1 | 0.30 | clear |
| 1355 | 120 | 12.66 | 10.90 | 6.83 | 0.366 | 3.88 | 79.6 | 0.36 | clear |
| 1400 | 120 | 12.66 | 10.78 | 6.77 | 0.401 | 3.56 | 82.6 | 0.28 | ↓ |
| 1405 | 120 | 12.66 | 10.80 | 6.69 | 0.460 | 3.10 | 85.7 | 0.26 | ↓ |
| 1410 | 120 | 12.66 | 10.82 | 6.66 | 0.507 | 3.07 | 85.8 | 0.27 | ↓ |
| 1415 | 120 | 12.66 | 10.80 | 6.66 | 0.510 | 3.04 | 86.0 | 0.25 | ↓ |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45µm
Duplicate (Y/N): N
Dup ID/Time:
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N)

**Comments**

Signature: Brett Archulewski
Date: 11/27/17

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-23

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/27/17
Location: Fort Devens Massachusetts Sampler: MMiller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | | X | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| CAP ~~Well~~ gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 2.0" |
| Material | PVC |
| Depth to water (ft BTOR) | 28.75 |
| Depth to bottom (ft BTOR) | 35.70 |
| Screen Interval (ft BTOR) | 24.85-34.85 |
| Total volume purged (gal) | 4.75 |

**Sampling Type**

Purging Method Bladder Tubing type PON Double Bonded Dedicated pump (Y/N) N
Purge start/stop time 1155 / 1235 Tubing diameter 1/4" Air source Nitrogen
Field Instrument (Model/S/N) Sample Pro (12752)
HACH 2100Q (11080C011551), YSI 556 MPS (16A104386)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1240 | 350 | 29.05 | 9.26 | 5.22 | 43 | 8.76 | 77.3 | 2.48 | Clear |
| 1245 | 250 | 29.00 | 9.25 | 5.05 | 43 | 9.07 | 88.0 | 2.28 | Clear |
| 1250 | 150 | 28.87 | 9.25 | 5.06 | 44 | 9.13 | 89.1 | 1.07 | Clear |
| 1255 | 150 | 28.85 | 9.25 | 5.00 | 44 | 9.12 | 95.6 | 0.97 | Clear |
| 1300 | 150 | 28.84 | 9.25 | 4.99 | 45 | 8.88 | 96.3 | 0.95 | Clear |
| 1305 | 150 | 28.82 | 9.25 | 4.98 | 45 | 8.89 | 98.7 | 0.90 | Clear |
| 1310 | 150 | 28.80 | 9.25 | 4.96 | 45 | 8.90 | 102.9 | 0.84 | Clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

SHL-23_FAL17 @ 1312

**Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45um Dup ID/Time:

Dedicated Tubing: (Y/N) Y

**Comments** Hinge is Broken

**Signature** Date 11/27/17

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-3

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/27/17
Sampler: M. Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | X | | X |
| PVC casing intact | X | | |
| Well gripper present | | X | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 29.75 |
| Depth to bottom (ft BTOR) | 34.15 |
| Screen Interval (ft BTOR) | 25.15 - 35.15 |
| Total volume purged (gal) | 4.25 |

**Sampling Type**

Purging Method: Bladder
Purge start/stop time: 1400/1430
Tubing type: Poly Double Bonded
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: Nitrogen
Field Instrument (Model/S/N): Sample Pro QED 2" (12752)
HACH 2100Q (11080C011551) YSI 556 MPS (16A104326)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1435 | 350 | 30.13 | 12.51 | 5.79 | 261 | 8.97 | 121.7 | 18.1 | Clear |
| 1440 | 250 | 30.01 | 12.47 | 5.71 | 258 | 8.23 | 122.8 | 12.6 | Clear |
| 1445 | 150 | 29.97 | 12.40 | 5.63 | 259 | 8.08 | 123.9 | 7.27 | Clear |
| 1450 | 150 | 29.95 | 12.37 | 5.62 | 256 | 7.14 | 125.3 | 5.13 | Clear |
| 1455 | 150 | 29.95 | 12.35 | 5.59 | 259 | 7.07 | 125.9 | 5.10 | Clear |
| 1500 | 150 | 29.94 | 12.32 | 5.53 | 261 | 7.01 | 126.3 | 5.07 | Clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHL-3-FAL17 1502
Field Filtered (Y/N): Y
Filter Size: .45 um
Duplicate (Y/N): N
Dup ID/Time:
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y, Left tubing in Well.

**Comments**

Signature

11/27/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHM-05-42A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/28/17
Sampler: MGA

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 4.42 |
| Depth to bottom (ft BTOR) | 44.28 |
| Screen Interval (ft BTOR) | 43.16 → 45.16 |
| Total volume purged (gal) | 3.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 820/850
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): —

YSI 556MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm$^c$) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 820 | 200 | 5.27 | 8.85 | 6.85 | 111 | 1.24 | 95.7 | 4.29 | Clear |
| 825 | ↓ | ↓ | 8.74 | 6.74 | 108 | 0.51 | 120.1 | 4.19 | ↓ |
| 830 | ↓ | ↓ | 8.63 | 6.41 | 107 | 0.41 | 124.1 | 4.17 | ↓ |
| 835 | ↓ | ↓ | 8.64 | 6.42 | 106 | 0.31 | 125.7 | 4.13 | ↓ |
| 840 | ↓ | ↓ | 8.71 | 6.41 | 106 | 0.28 | 126.9 | 4.11 | ↓ |
| 845 | ↓ | ↓ | 8.73 | 6.42 | 105 | 0.27 | 127.3 | 4.11 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SHM-05-42A Fall17 @ 850 Full list

[signature]
**Signature**

11/28/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHM-05-42B

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/28/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 1" |
| Material | PVC |
| Depth to water (ft BTOR) | 4.52 |
| Depth to bottom (ft BTOR) | 73.38 |
| Screen Interval (ft BTOR) | 73.15 → 75.15 |
| Total volume purged (gal) | 3.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 920/955
Tubing type: teflon lined poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source: N/A
Field Instrument (Model/S/N): —

YSI 556 MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 920 | 200 | 5.27 | 8.47 | 7.05 | 355 | 1.29 | -17.9 | 3.01 | Clear |
| 925 | ↓ | ↓ | 8.43 | 7.09 | 359 | 1.01 | -19.7 | 3.04 | ↓ |
| 930 | ↓ | ↓ | 8.46 | 7.09 | 361 | 0.64 | -30.1 | 3.09 | ↓ |
| 935 | ↓ | ↓ | 8.49 | 7.16 | 360 | 0.52 | -32.5 | 2.99 | ↓ |
| 940 | ↓ | ↓ | 8.50 | 7.16 | 364 | 0.50 | -33.9 | 2.89 | ↓ |
| 945 | ↓ | ↓ | 8.52 | 7.17 | 362 | 0.49 | -33.9 | 2.87 | ↓ |
| 950 | ↓ | ↓ | 8.52 | 7.17 | 364 | 0.48 | -34.2 | 2.87 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) N

**Comments** SHM-05-42B Fall17 @ 955 Fall 1st

[signature]
**Signature**

11/28/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-13-07

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/28/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | |
| Locked (stickup wells) | | | ✓ |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 6.13 |
| Depth to bottom (ft BTOR) | 35.01 |
| Screen Interval (ft BTOR) | 26.53 → 36.53 |
| Total volume purged (gal) | 3.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1220/1255
Tubing type: Poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 17J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1220 | 200 | 18.81 | 12.05 | 7.52 | 902 | 0.76 | -50.6 | 10.24 | gray |
| 1225 | ↓ | ↓ | 12.03 | 7.51 | 890 | 0.72 | -52.1 | 8.97 | ↓ |
| 1230 | | | 12.02 | 7.51 | 882 | 0.31 | -62.5 | 7.21 | |
| 1235 | | | 12.03 | 7.51 | 880 | 0.29 | -64.7 | 5.90 | |
| 1240 | | | 12.04 | 7.52 | 878 | 0.27 | -66.6 | 5.27 | |
| 1245 | | | 12.06 | 7.52 | 877 | 0.27 | -67.1 | 5.26 | |
| 1250 | ↓ | ↓ | 12.07 | 7.52 | 874 | 0.26 | -67.3 | 5.24 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SHM-13-07-Fall17 @ 1255 Fall 1st

[signature]
**Signature**

11/28/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-99-31C- Fall 2017

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/28/17
Sampler: Brett Arnhulcutts

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | — | | |
| Concrete Pad intact | | | — |
| PVC casing intact | — | | |
| Well gripper present | — | | |
| Bolts present | | | — |
| Locked (stickup wells) | — | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 4.44 |
| Depth to bottom (ft BTOR) | 80.01 |
| Screen Interval (ft BTOR) | |
| Total volume purged (gal) | |

**Sampling Type**

Purging Method: Peristaltic
Purge start/stop time: 0800/0920
Tubing type: LDPE
Tubing diameter: 1/4"
Dedicated pump (Y/N):
Air source:
Field Instrument (Model/S/N): YSI 650

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0825 | 140 | 4.51 | 7.88 | 7.43 | 0.652 | 8.50 | 111.2 | 29.5 | |
| 0830 | 100 | 4.49 | 8.40 | 6.75 | 0.742 | 4.41 | 90.7 | 27.1 | |
| 0835 | 110 | 4.50 | 8.35 | 6.68 | 0.753 | 4.51 | 87.6 | 11.3 | |
| 0840 | 110 | 4.50 | 8.37 | 6.65 | 0.751 | 4.58 | 80.2 | 9.92 | |
| 0845 | 110 | 4.50 | 8.41 | 6.70 | 0.739 | 4.58 | 65.2 | 6.15 | |
| 0850 | 110 | 4.50 | 8.41 | 6.71 | 0.727 | 4.38 | 51.0 | 5.08 | |
| 0855 | 110 | 4.50 | 8.56 | 6.73 | 0.699 | 4.17 | 8.8 | 3.63 | |
| 0900 | 110 | 4.50 | 8.57 | 6.73 | 0.689 | 4.22 | 2.6 | 3.00 | |
| 0905 | 110 | 4.50 | 8.58 | 6.72 | 0.676 | 3.88 | -13.6 | 2.96 | |
| 0910 | 110 | 4.50 | 8.64 | 6.73 | 0.675 | 3.83 | -26.6 | 1.99 | |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45
Duplicate (Y/N): N
Dup ID/Time:
MS/MSD (Y/N): N

Dedicated Tubing (Y/N): Y

**Comments** Some measurements did not stabilize

Signature

11/28/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-99-32X-Fall 2017

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/28/17
Sampler: Brett Anchukaitis

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | — | | |
| Concrete Pad intact | | | — |
| PVC casing intact | — | | |
| Well gripper present | — | | |
| Bolts present | | | — |
| Locked (stickup wells) | — | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 9.50 |
| Depth to bottom (ft BTOR) | 54.05 |
| Screen Interval (ft BTOR) | |
| Total volume purged (gal) | |

**Sampling Type**

Purging Method: Peristaltic
Purge start/stop time: 1010/
Tubing type: LDPE
Tubing diameter: 1/4"
Dedicated pump (Y/N):
Air source:
Field Instrument (Model/S/N): YSI 650

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1010 | 140 | 9.95 | 9.30 | 7.17 | 0.463 | 6.15 | -35.8 | 66.8 | brown/murky |
| 1015 | 140 | 9.90 | 9.49 | 7.02 | 0.413 | 3.34 | -30.4 | 27.8 | brown/murky |
| 1020 | 120 | 9.95 | 9.77 | 6.98 | 0.387 | 3.16 | -36.0 | 14.0 | clear |
| 1025 | 120 | 9.95 | 9.93 | 6.96 | 0.371 | 2.51 | -42.9 | 13.80 | ↓ |
| 1030 | 120 | 9.95 | 10.01 | 6.95 | 0.365 | 2.14 | -49.9 | 11.46 | ↓ |
| 1035 | 120 | 9.94 | 10.00 | 6.93 | 0.363 | 2.00 | -53.1 | 10.16 | ↓ |
| 1040 | 120 | 9.95 | 10.02 | 6.92 | 0.362 | 1.95 | -55.3 | 8.13 | ↓ |
| 1045 | 120 | 9.94 | 10.07 | 6.92 | 0.362 | 1.93 | -57.1 | 6.28 | ↓ |
| 1050 | 120 | 9.94 | 10.11 | 6.91 | 0.362 | 1.86 | -58.3 | 4.61 | ↓ |
| 1055 | 120 | 9.95 | 10.15 | 6.91 | 0.362 | 1.85 | -59.1 | 4.28 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45 µm
Duplicate (Y/N): N
Dup ID/Time:
MS/MSD (Y/N):

Dedicated Tubing: (Y/N)

**Comments**

Signature

11/28/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-13-01-Fall 2017

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/28/17
Sampler: Brett Archulatis

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | — | | |
| Concrete Pad intact | | | — |
| PVC casing intact | — | | |
| Well gripper present | — | | |
| Bolts present | | | — |
| Locked (stickup wells) | — | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 3.00 |
| Depth to bottom (ft BTOR) | 50.80 |
| Screen Interval (ft BTOR) | |
| Total volume purged (gal) | |

**Sampling Type**

Purging Method: Peristaltic
Purge start/stop time: 1145/1250
Tubing type: LDPE
Tubing diameter: 1/4"
Dedicated pump (Y/N): N
Air source:
Field Instrument (Model/S/N): YSI 650

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1150 | 110 | 3.01 | 9.28 | 7.01 | 0.232 | 11.27 | -12.1 | 1.03 | Clear |
| ~~1200~~ 1155 | 105 | 3.01 | 10.09 | 6.65 | 0.244 | 8.16 | 9.6 | 1.00 | |
| 1200 | 100 | 3.01 | 10.03 | 6.47 | 0.266 | 7.49 | 24.0 | 0.83 | |
| 1205 | 100 | 3.01 | 10.08 | 6.38 | 0.269 | 7.15 | 33.0 | 0.42 | |
| 1210 | 100 | 3.01 | 10.13 | 6.31 | 0.274 | ~~6.45~~ 6.91 | 41.0 | 0.45 | |
| 1215 | 100 | 3.01 | 10.25 | 6.28 | 0.287 | 6.82 | 46.1 | 0.37 | |
| 1220 | 100 | 3.01 | 10.26 | 6.26 | 0.295 | 6.73 | 50.2 | 0.83 | |
| 1225 | 100 | 3.01 | 10.23 | 6.24 | 0.298 | 6.64 | 53.8 | 0.36 | |
| 1230 | 100 | 3.01 | 10.32 | 6.22 | 0.302 | 6.51 | 56.9 | 0.41 | |
| 1235 | 100 | 3.01 | 10.29 | 6.21 | 0.304 | 6.44 | 58.4 | 0.35 | |
| 1240 | 100 | 3.01 | 10.25 | 6.20 | 0.306 | 6.41 | 58.6 | 0.40 | |
| | 100 | 3.01 | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 0.45 µm
Duplicate (Y/N): N
Dup ID/Time:
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments**

Signature

11/28/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-06A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/28/17
Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1.5" |
| Material | PVC |
| Depth to water (ft BTOR) | 28.90 |
| Depth to bottom (ft BTOR) | 86.05 |
| Screen Interval (ft BTOR) | 82.85-87.85 |
| Total volume purged (gal) | 2.75 |

**Sampling Type** Micro
Purging Method Bladder
Purge start/stop time 930/955
Tubing type Double Bonded
Tubing diameter 1/4"
Dedicated pump (Y/N) N
Air source Nitrogen
Field Instrument (Model/S/N) Geotech Micro Bladder
HACH 2100Q (11080C011551), YSI556MPS (16A104326), (1058)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1000 | 200 | 37.60 | 7.82 | 6.64 | 492 | 0.80 | -53.8 | 11.13 | clear |
| 1005 | 125 | 39.40 | 8.11 | 6.71 | 450 | 0.70 | -69.3 | 5.22 | clear |
| 1010 | 75 | 41.55 | 8.31 | 6.75 | 435 | 0.64 | -91.1 | 3.62 | clear |
| 1015 | 75 | 41.79 | 8.26 | 6.77 | 418 | 0.61 | -102.1 | 3.41 | clear |
| 1020 | 75 | 41.82 | 8.24 | 6.77 | 415 | 0.60 | -104.7 | 3.39 | clear |
| 1025 | 75 | 41.96 | 8.25 | 6.78 | 413 | 0.60 | -105.2 | 3.32 | clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHP-2016-06A-FAL17 @ 1020
Field Filtered (Y/N): Y
Filter Size: .45 µm
Duplicate (Y/N): N
Dup ID/Time:
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** Placed dedicated tubing in well

Melissa Miller
**Signature**

11/28/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-06B

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/28/17
Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1.5" |
| Material | PVC |
| Depth to water (ft BTOR) | 22.70 |
| Depth to bottom (ft BTOR) | 112.55 |
| Screen Interval (ft BTOR) | 103.84-113.84 |
| Total volume purged (gal) | 2.75 |

**Sampling Type**

Purging Method Bladder Tubing type Double Bonded Dedicated pump (Y/N) N
Purge start/stop time 1130/1215 Tubing diameter 1/4" Air source Nitrogen
Field Instrument (Model/S/N) Geotech Micro Bladder
HACH 2100Q(11080C011551), YSI 556 MPS (16A104326), (1059)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1220 | 225 | 25.42 | 7.64 | 6.75 | 395 | 3.71 | -61.9 | 23.5 | Clear |
| 1225 | 125 | 25.23 | 7.41 | 6.80 | 402 | 1.11 | -62.3 | 22.9 | Clear |
| 1230 | 75 | 24.19 | 7.12 | 6.80 | 428 | 0.97 | -63.7 | 15.7 | Clear |
| 1235 | 75 | 24.22 | 7.16 | 6.77 | 476 | 0.86 | -64.3 | 9.01 | Clear |
| 1240 | 75 | 24.18 | 7.18 | 6.79 | 471 | 0.80 | -69.1 | 8.67 | Clear |
| 1245 | 75 | 24.20 | 7.20 | 6.81 | 469 | 0.79 | -69.5 | 8.49 | Clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

SHP-2016-06B-FAL17 @ 1247 **Sampling Details**

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45um Dup ID/Time:

Dedicated Tubing: (Y/N) Y

**Comments** Placed dedicated tubing ★ changed tank

Signature 11/28/17 Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHP-2016-06C

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/28/17
Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 1.5" |
| Material | PVC |
| Depth to water (ft BTOR) | 22.78 |
| Depth to bottom (ft BTOR) | 133.95 |
| Screen Interval (ft BTOR) | 124.87-134.87 |
| Total volume purged (gal) | 2.75 |

**Sampling Type**

Purging Method Bladder Tubing type Double Bonded Dedicated pump (Y/N) N
Purge start/stop time 1330/1400 Tubing diameter 1/4" Air source Nitrogen
Field Instrument (Model/S/N) Geotech Micro
HACH 2100Q (11080C01151), YSI 556 MPS (16A104326), Bladder: 1059

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1405 * | 175 | 23.20 | 7.71 | 6.95 | 251 | 4.82 | -73.7 | 8.53 | Clear |
| 1410 | 125 | 23.23 | 7.69 | 7.02 | 252 | 3.26 | -79.2 | 9.95 | Clear |
| 1415 | 125 | 23.29 | 7.74 | 7.06 | 252 | 2.85 | -84.9 | 9.62 | Clear |
| 1420 | 125 | 23.30 | 7.75 | 7.08 | 253 | 2.83 | -85.4 | 9.60 | Clear |
| 1425 | 125 | 23.31 | 7.72 | 7.08 | 253 | 2.79 | -87.1 | 9.57 | Clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHP-2016-06C- FALL7 @ 1420
Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size: .45 um Dup ID/Time:

Dedicated Tubing: (Y/N) Y.

**Comments** Placed dedicated tubing * changed form

Signature

11/28/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SHM-93-10D

Project: Shepley's Hill Landfill- Fall 2017 | Date: 11/29/17
Location: Fort Devens Massachusetts | Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| Steel ~~PVC~~ casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | X | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | Steel |
| Depth to water (ft BTOR) | 30.02 |
| Depth to bottom (ft BTOR) | 58.80 |
| Screen Interval (ft BTOR) | 48.70-58.70 |
| Total volume purged (gal) | 7.25 |

**Sampling Type**

Purging Method: Bladder | Tubing type: PoM Double Bonded | Dedicated pump (Y/N): N
Purge start/stop time: 840/940 | Tubing diameter: 1/4" | Air source: Nitrogen
Field Instrument (Model/S/N): ~~[illegible] Bladder~~
HACH 2100Q(11080C011551), YSI 556 MPS(16A104326), (12752) ~~[illegible]~~ Sample Pro

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 0945 | 500 | 36.60 | 10.61 | 8.07 | 564 | 4.02 | 71.5 | 62.9 | cloudy, orange |
| 0950 | 350 | 40.80 | 10.66 | 8.19 | 561 | 1.94 | 48.2 | 75.4 | Cloudy, orange |
| 0955 | 250 | 43.60 | 11.04 | 8.21 | 557 | 1.77 | 32.3 | 43.4 | cloudy, orange |
| 1000 ★ | 150 | 46.56 | 11.95 | 8.26 | 552 | 1.72 | 10.0 | 37.7 | cloudy |
| 1005 | 150 | 46.05 | 12.86 | 8.09 | 549 | 1.88 | -9.8 | 36.8 | cloudy |
| 1010 | 150 | 46.17 | 12.97 | 8.07 | 547 | 1.85 | -10.12 | 35.9 | cloudy/clear |
| 1015 | 150 | 46.49 | 13.03 | 8.10 | 545 | 1.91 | -13.18 | 35.7 | cloudy/clear |
| 1020 | 150 | 46.81 | 13.08 | 8.09 | 545 | 1.98 | -15.8 | 34.2 | clear |
| 1025 | 150 | 46.87 | 13.10 | 8.06 | 544 | 2.01 | -16.0 | 34.1 | clear |
| 1030 | 150 | 46.92 | 13.12 | 8.05 | 543 | 2.00 | -16.2 | 34.3 | Clear |
| 1035 | 150 | 46.95 | 13.12 | 8.04 | 543 | 2.00 | -18.3 | 34.2 | Clear |
| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

SHM-93-10D_FAL17@ 1037
Field Filtered (Y/N): Y | Duplicate (Y/N): _____
Filter Size: .45 um | Dup ID/Time: _____

SHM-93-10D_FAL17_MS
MS/MSD (Y/N): Y
SHM-93-10D_FAL17_MSD

Dedicated Tubing: (Y/N): Y. 1/2 poly, Double Bonded Poly

**Comments** ★ changed tank.

Melissa Miller
**Signature**

11/29/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-10

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/29/17
Location: Fort Devens Massachusetts Sampler: Melissa Miller

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | X | | |
| Concrete Pad intact | | | X |
| PVC casing intact | X | | |
| Well gripper present | X | | |
| Bolts present | | | X |
| Locked (stickup wells) | ~~X~~ | X | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 32.50 |
| Depth to bottom (ft BTOR) | 38.67 |
| Screen Interval (ft BTOR) | 24.40-40.40 |
| Total volume purged (gal) | 6.25 |

**Sampling Type**
Purging Method Bladder Pump Tubing type Poly Double Bonded Dedicated pump (Y/N) N
Purge start/stop time 1225/1315 Tubing diameter 1/4" Air source Nitrogen
Field Instrument (Model/S/N) Sample Pro (12752)
HACH 2100Q (11080C011SA), YSI 556 MPS (16A1043.26)

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1320 | 300 | 36.40 | 11.11 | 6.42 | 32 | 9.12 | 85.5 | 12.60 | Cloudy |
| 1325 | 150 | 36.32 | 10.96 | 6.33 | 29 | 11.20 | 87.6 | 4.82 | Clear |
| 1330 | 150 | 36.23 | 10.94 | 6.30 | 29 | 10.13 | 93.7 | 2.01 | Clear |
| 1335 | 150 | 36.20 | 10.86 | 6.28 | 29 | 9.30 | 97.2 | 1.74 | Clear |
| 1340 | 150 | 36.18 | 10.83 | 6.26 | 30 | 9.27 | 98.3 | 1.68 | Clear |
| 1345 | 150 | 36.16 | 10.81 | 6.25 | 30 | 9.24 | 104.9 | 1.42 | Clear |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**
SHL-10_FAL17 @ 1347 SHL-10-FAL17-MS
Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): Y
Filter Size: .45µM Dup ID/Time: SHL-10-FAL17-MSD

Dedicated Tubing: (Y/N) Y, left tubing in place

**Comments** Had to change Bladder due to sand @ 1300

Melissa Miller
**Signature**

11/29/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMM-93-24A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/29/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft BTOR) | 15.20 |
| Depth to bottom (ft BTOR) | 25.84 |
| Screen Interval (ft BTOR) | 16.23 → 26.23 |
| Total volume purged (gal) | 6.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 840/905
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): tubing
Air source: N/A
Field Instrument (Model/S/N): —

YSI 556MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 840 | 200 | 16.13 | 12.70 | 6.46 | 576 | 7.79 | 181.6 | 9.73 | clear |
| 845 | ↓ | ↓ | 12.75 | 6.46 | 574 | 7.31 | 183.1 | 4.99 | ↓ |
| 850 | | | 12.73 | 6.46 | 572 | 6.42 | 184.1 | 4.22 | |
| 855 | | | 12.77 | 6.46 | 571 | 6.41 | 185.1 | 4.13 | |
| 900 | ↓ | ↓ | 12.78 | 6.45 | 568 | 6.40 | 186.9 | 4.10 | ↓ |
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SMM-93-24A - Fall 17 @ 905 Full list

**Signature**

11/29/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SML-24

Project: Shepley's Hill Landfill- Fall 2017 Date: 11/29/17
Location: Fort Devens Massachusetts Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 4" |
| Material | PVC |
| Depth to water (ft BTOR) | 14.95 |
| Depth to bottom (ft BTOR) | 120.45 |
| Screen Interval (ft BTOR) | 111.96 → 121.96 |
| Total volume purged (gal) | 6.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 1000/1035
Tubing type: teflon lined poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): tubing added
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 11J100112 / Lamotte 2020LE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1000 | 200 | 16.88 | 12.28 | 6.95 | 284 | 2.47 | 143.8 | 1.79 | Clear |
| 1005 | ↓ | ↓ | 12.27 | 7.09 | 283 | 2.31 | 132.6 | 1.47 | ↓ |
| 1010 | | | 12.16 | 7.12 | 282 | 2.16 | 126.7 | 1.41 | |
| 1015 | | | 12.13 | 7.14 | 280 | 2.09 | 119.7 | 1.30 | |
| 1020 | | | 12.14 | 7.15 | 280 | 2.06 | 118.2 | 1.29 | |
| 1025 | | | 12.11 | 7.19 | 280 | 2.03 | 117.3 | 1.29 | |
| 1030 | ↓ | ↓ | 12.13 | 7.16 | 289 | 2.01 | 117.2 | 1.27 | ↓ |
| | | | | | | | | | |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Added

**Comments** SML-24 - Fall17 @ 1035 Full list

[signature]
**Signature**

11/29/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHL-12

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/29/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 22.10 |
| Depth to bottom (ft BTOR) | 28.71 |
| Screen Interval (ft BTOR) | 16.40 → 31.40 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: peristaltic
Purge start/stop time: 1150/1220
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): YSI 556 MPS 11F100112 / LaMotte 2020WE 8249-416

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1150 | 200 | 22.52 | 12.69 | 7.00 | 642 | 1.94 | 124.3 | 3.04 | clear |
| 1155 | ↓ | ↓ | 12.69 | 6.97 | 643 | 1.29 | 129.7 | 3.02 | ↓ |
| 1200 | ↓ | ↓ | 12.68 | 6.87 | 642 | 0.89 | 138.1 | 3.01 | ↓ |
| 1205 | ↓ | ↓ | 12.70 | 6.87 | 641 | 0.73 | 141.6 | 2.99 | ↓ |
| 1210 | ↓ | ↓ | 12.71 | 6.86 | 640 | 0.71 | 142.3 | 2.97 | ↓ |
| 1215 | ↓ | ↓ | 12.73 | 6.86 | 640 | 0.69 | 144.4 | 2.96 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: 1.45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SHL-12- Fall 17 @ 1220 Fall 1st

[illegible]
**Signature**

11/29/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SMP-2016-7A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/30/17
Sampler: KGS

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 1.54 |
| Material | PVC |
| Depth to water (ft BTOR) | 31.44 |
| Depth to bottom (ft BTOR) | 37.79 |
| Screen Interval (ft BTOR) | 24.32 → 34.32 |
| Total volume purged (gal) | 2.0 |

**Sampling Type**

Purging Method: geotech
Purge start/stop time: 750/815
Tubing type: poly
Tubing diameter: 1/4"
Dedicated pump (Y/N): Tubing
Air source: N/A
Field Instrument (Model/S/N): —

YSI 556 MPS 15100112 / LaMotte 2020 WE 8241-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 750 | 75 | 27.74 | 8.69 | 7.64 | 164 | 7.79 | 127.1 | 12.8 | clear |
| 755 | ↓ | 28.09 | 8.51 | 6.63 | 153 | 6.50 | 143.9 | 6.97 | ↓ |
| 800 | ↓ | 28.39 | 8.52 | 6.61 | 152 | 5.39 | 152.1 | 5.90 | ↓ |
| 805 | ↓ | 28.61 | 8.60 | 6.61 | 150 | 5.33 | 153.6 | 5.89 | ↓ |
| 810 | ↓ | 28.94 | 8.62 | 6.60 | 149 | 5.30 | 154.1 | 5.88 | ↓ |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Y

**Comments** SMP-2016-7A - Fall 17 @ 815 Full list

Signature

11/30/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

KGS

**Well Identification:** SMP-2016-7B-

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/30/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | ✓ |
| Bolts present | ✓ | | |
| Locked (stickup wells) | | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 32.85 |
| Depth to bottom (ft BTOR) | 80.62 |
| Screen Interval (ft BTOR) | 72.35 → 82.35 |
| Total volume purged (gal) | 2.0 |

**Sampling Type**

Purging Method: Micro Bladder
Purge start/stop time: 920/955
Tubing type: poly
Tubing diameter: 1/4" x 1/4"
Dedicated pump (Y/N): N (added)
Air source: N
Field Instrument (Model/S/N): —

YSI 556 MPS 11J100112 / LaMotte 2020WE 8249 4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 920 | 75 | 32.47 | 9.76 | 7.33 | 294 | 1.55 | -22.6 | >2000 | cloudy |
| 925 | ↓ | 32.71 | 10.27 | 7.33 | 294 | 1.53 | -28.7 | 113.1 | cloudy |
| 930 | | 33.20 | 10.36 | 7.35 | 293 | 1.52 | -32.9 | 72.0 | Semicloudy |
| 935 | | 33.90 | 10.47 | 7.36 | 292 | 1.51 | -37.8 | 31.7 | partly cloudy |
| 940 | | 34.43 | 10.49 | 7.35 | 291 | 1.50 | -41.6 | 19.2 | Clear |
| 945 | | 34.89 | 10.52 | 7.34 | 291 | 1.48 | -43.1 | 19.0 | Clear |
| 950 | | 35.39 | 10.53 | 7.32 | 290 | 1.47 | -44.4 | 18.9 | clear |
| | | | | | | | | | |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Added

**Comments** SMP-2016-7B- Fall 17 @ 955 Full list

[signature]
**Signature**

11/30/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM- 10-12

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/30/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | ✓ | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 34.01 |
| Depth to bottom (ft BTOR) | 57.29 |
| Screen Interval (ft BTOR) | 47.60 → 57.60 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: Bladder Pump
Purge start/stop time: 1120/1150
Tubing type: Poly
Tubing diameter: 1/4" x 1/4"
Dedicated pump (Y/N): Added
Air source: N
Field Instrument (Model/S/N): —
YSI 556 MPS 11J100112 / LaMotte 2020WE 8247- 4/16

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm^c) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1120 | 200 | 34.04 | 10.78 | 6.91 | 400 | 0.58 | -21.1 | 11.9 | clear |
| 1125 | ↓ | ↓ | 10.79 | 6.90 | 399 | 0.43 | -20.1 | 8.67 | ↓ |
| 1130 | | | 10.84 | 6.89 | 396 | 0.40 | -19.9 | 7.69 | |
| 1135 | | | 10.87 | 6.88 | 394 | 0.38 | -19.6 | 6.66 | |
| 1140 | | | 10.86 | 6.88 | 393 | 0.37 | -19.2 | 6.64 | |
| 1145 | | | 10.83 | 6.87 | 392 | 0.35 | -19.0 | 6.62 | |
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| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): ~~N~~ Y
Dup ID/Time: ~~SHA~~ SHL- DUP-05- Fall17 @ 1155
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) added

**Comments** SHM- 10-12- Fall17 @ 1150 Full list

[signature]
**Signature**

11/30/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-10-11

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/30/17
Sampler: [illegible]

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | ✓ | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | 2" |
| Material | PVC |
| Depth to water (ft BTOR) | 40.48 |
| Depth to bottom (ft BTOR) | 62.57 |
| Screen Interval (ft BTOR) | 52.60 → 62.60 |
| Total volume purged (gal) | 4.0 |

**Sampling Type**

Purging Method: Bladder pump
Purge start/stop time: 1310/1345
Tubing type: Poly
Tubing diameter: 1/4" x 1/4"
Dedicated pump (Y/N): Added
Air source: N
Field Instrument (Model/S/N): —
YSI 556 MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm°) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1310 | 200 | 40.43 | 10.50 | 7.03 | 371 | 0.48 | -25.7 | 14.1 | clear |
| 1315 | ↓ | ↓ | 10.51 | 7.04 | 368 | 0.39 | -28.7 | 12.3 | ↓ |
| 1320 | | | 10.52 | 7.05 | 363 | 0.35 | -33.0 | 11.6 | |
| 1325 | | | 10.86 | 7.05 | 365 | 0.29 | -35.1 | 9.79 | |
| 1330 | | | 10.99 | 7.06 | 364 | 0.26 | -37.3 | 9.21 | |
| 1335 | | | 10.97 | 7.06 | 363 | 0.26 | -37.9 | 9.20 | |
| 1340 | ✓ | ✓ | 10.95 | 7.05 | 363 | 0.25 | -38.1 | 9.19 | ✓ |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) Added

**Comments** SHM-10-11 - Fall 17 @ 1345 Full list

**Signature**

11/30/17
Date

**KOMAN GOVERNMENT SOLUTIONS LLC**
Low Flow/ Low Stress Groundwater Sampling Log

**Well Identification:** SHM-10-06A

Project: Shepley's Hill Landfill- Fall 2017
Location: Fort Devens Massachusetts
Date: 11/30/17
Sampler: KGS

**Well Integrity**

| | Yes | No | N/A |
|---|---|---|---|
| Casing Secure | ✓ | | |
| Concrete Pad intact | ✓ | | |
| PVC casing intact | ✓ | | |
| Well gripper present | ✓ | | |
| Bolts present | | | ✓ |
| Locked (stickup wells) | ✓ | | |

**Well Information**

| | |
|---|---|
| Diameter | ~~2~~ 4 1.5" |
| Material | PVC |
| Depth to water (ft BTOR) | 34.02 |
| Depth to bottom (ft BTOR) | 89.95 |
| Screen Interval (ft BTOR) | 79.58 → 89.88 |
| Total volume purged (gal) | 2.0 |

**Sampling Type**

Purging Method: MicroBladder
Purge start/stop time: 1455 / 1530
Tubing type: Poly
Tubing diameter: 1/4" x 1/4"
Dedicated pump (Y/N): N
Air source: N
Field Instrument (Model/S/N): —
YSI 556 MPS 11J100112 / LaMotte 2020WE 8249-4116

**Stabilization Parameters**

| Time (hhmm) | Flow Rate (ml/min) | Depth to Water (ft) | Temp (°C) | pH (STD) | SPC (µS/cm[c]) | DO (mg/L) | ORP (mv) | Turbidity (NTU) | Color/Clarity |
|---|---|---|---|---|---|---|---|---|---|
| 1455 | 50 | 34.28 | 8.07 | 7.16 | 150 | 4.56 | 41.8 | 31.6 | clear |
| 1500 | ↓ | ↓ | 8.09 | 7.03 | 157 | 3.91 | 46.1 | 26.9 | ↓ |
| 1505 | ↓ | ↓ | 8.17 | 6.99 | 163 | 3.12 | 50.8 | 25.1 | ↓ |
| 1510 | ↓ | ↓ | 8.21 | 7.00 | 166 | 3.09 | 53.7 | 23.1 | ↓ |
| 1515 | ↓ | ↓ | 8.20 | 7.01 | 168 | 3.07 | 54.2 | 23.3 | ↓ |
| 1520 | ↓ | ↓ | 8.19 | 7.00 | 169 | 3.03 | 55.5 | 23.2 | ↓ |
| 1525 | ↓ | ↓ | 8.24 | 7.00 | 170 | 2.99 | 55.9 | 23.0 | ↓ |
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| | | | | | | | | | |
| Acceptance Criteria: | | <0.3ft | ±3% | ±0.1 | ±3% | ±10% | ± 10mv | 10% | |

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

**Sampling Details**

Field Filtered (Y/N): Y
Filter Size: .45
Duplicate (Y/N): N
Dup ID/Time: N/A
MS/MSD (Y/N): N

Dedicated Tubing: (Y/N) N

**Comments** SHM-10-06A - Fall 17 @ 1530 Fall 1st

Signature

11/30/17
Date

KGS

# Field Instrument Calibration Log

**Date:** 11/3/17 **Weather:** 60's

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556MPS

**Calibrated By:** WA **Serial Number:** 15J100112

| Parameters | Solution Expiration Date | Morning Calibration Time 725 | | Cal. Temperature °C | Afternoon Calibration Time 1330 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.411 | 1.413 | 16.59 | 1.420 | 1.413 | 16.71 |
| pH (7) | 12/31/18 | 7.01 | 7.00 | | 6.87 | 7.00 | |
| pH (4) | 6/31/19 | 4.01 | 4.00 | | 3.96 | 4.00 | |
| pH (10) | 12/31/18 | 10.02 | 10.00 | | 9.86 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 239.7 | 240.0 | | 237.2 | 240.0 | |
| Dissolved Oxygen (%) | - | 101.0% | 100.0% | | 96.1% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 11/3/17

KGS

# Field Instrument Calibration Log

**Date:** 11/6/17 **Weather:** Rain

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** WA **Serial Number:** 11J100112

| Parameters | Solution Expiration Date | Morning Calibration Time 705 | | Cal. Temperature °C | Afternoon Calibration Time 1420 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.431 | 1.413 | 16.32° | 1.412 | 1.413 | 16.80° |
| pH (7) | 12/31/18 | 7.07 | 7.00 | | 7.07 | 7.00 | |
| pH (4) | 6/31/19 | 4.06 | 4.00 | | 4.06 | 4.00 | |
| pH (10) | 12/31/18 | 10.09 | 10.00 | | 10.09 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 243.6 | 240.0 | | 236.9 | 240.0 | |
| Dissolved Oxygen (%) | - | 106.9% | 100.0% | | 100.0% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 11/6/17

KGS

**Field Instrument Calibration Log**

**Date:** 11/6/2017 **Weather:** overcast / rain

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** JMF **Serial Number:** 15C103559

| Parameters | Solution Expiration Date | Morning Calibration Time 655 (KKA) | | Cal. Temperature °C | Afternoon Calibration Time 15:00 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm) | 6/30/18 | 1.430 | 1.413 | 15.81° | 1.460 | 1.413 | 16.66 |
| pH (7) | 6/30/18 | 7.11 | 7.00 | | 6.70 | 7.00 | |
| pH (4) | 2/19 | 4.03 | 4.00 | | 4.30 | 4.00 | |
| pH (10) | 10/18 | 10.09 | 10.00 | | 9.79 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 236.1 | 240.0 | | 244.2 | 240.3 | |
| Dissolved Oxygen (%) | - | 96.1% | 100.0% | | 113.3 | 100.0 | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** Jenifer Flood JMF / KKA **Date:** 11/6/2017

KGS

# Field Instrument Calibration Log

**Date:** 11/7/17 **Weather:** 40's

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI556MPS

**Calibrated By:** [illegible] **Serial Number:** 11J100112

| Parameters | Solution Expiration Date | Morning Calibration Time 720 | | Cal. Temperature °C | Afternoon Calibration Time 1430 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.403 | 1.413 | 14.21° | 1.412 | 1.413 | 15.29° |
| pH (7) | 12/31/18 | 7.20 | 7.09 | | 7.06 | 7.09 | |
| pH (4) | 6/31/19 | 4.19 | 4.09 | | 4.02 | 4.00 | |
| pH (10) | 12/31/18 | 10.07 | 10.00 | | 9.97 | 10.00 | |
| ORP (240 mv) | 1/31/19 | 238.1 | 249.9 | | 238.1 | 249.0 | |
| Dissolved Oxygen (%) | - | 109.6% | 100.0% | | 102.1% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 11/7/17

KGS

# Field Instrument Calibration Log

**Date:** 11/7/2017

**Weather:** Low 40s, sunny

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling

**Instrument:** YSI 556 MPS

**Calibrated By:** JMF

**Serial Number:** 15C103559

| Parameters | Solution Expiration Date | Morning Calibration Time 0750 | | Cal. Temperature °C | Afternoon Calibration Time 1458 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.507 | 1.413 | | 1.302 | 1.413 | 8.96 |
| pH (7) | | 7.32 | 7.00 | | 7.08 | 7.00 | |
| pH (4) | | 4.14 | 4.00 | | 4.65 | 4.00 | |
| pH (10) | | 9.87 | 10.00 | | 9.40 | 10.00 | |
| ORP (240 mv) | | 259.4 | 240.0 | | 230.4 | 240.0 | |
| Dissolved Oxygen (%) | - | 102.3 | 100.1 | | 108.8 | 100.0 | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [illegible]

**Date:** 11/7/17

KGS

# Field Instrument Calibration Log

**Date:** 11/8/17 **Weather:** 40's

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI556MPI

**Calibrated By:** [illegible] **Serial Number:** 11J100112

| Parameters | Solution Expiration Date | Morning Calibration Time 705 | | Cal. Temperature °C | Afternoon Calibration Time 1300 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.413 | 1.413 | 13.99° | 1.419 | ~~1.413~~ 1.413 | 14.29° |
| pH (7) | 12/31/18 | 7.13 | 7.00 | | 7.03 | 7.00 | |
| pH (4) | 6/31/19 | 3.97 | 4.00 | | 4.06 | 4.00 | |
| pH (10) | 12/31/18 | 10.07 | 10.00 | | 9.97 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 246.9 | 240.0 | | 234.1 | 237.9 | |
| Dissolved Oxygen (%) | - | 99.6% | 100.0% | | 103.2% | 101.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 11/8/17

KGS

# Field Instrument Calibration Log

**Date:** 11/8/17

**Weather:** High 30 s

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling

**Instrument:** YSI 556 MPS

**Calibrated By:** JMF

**Serial Number:** 15C103559

| Parameters | Solution Expiration Date | Morning Calibration Time 0740 | | Cal. Temperature °C | Afternoon Calibration Time 1345 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.385 | 1.412 | | 1.453 | 1.413 | 7.40 |
| pH (7) | 6/30/18 | 7.30 | 7.00 | | 7.12 | 7.00 | 7.13 |
| pH (4) | 2/2019 | 4.59 | 3.99 | | 4.36 | 3.99 | 7.13 |
| pH (10) | 10/18 | 9.68 | 10.00 | | 9.25 | 10.00 | 7.10 |
| ORP (240 mv) | 1/31/2022 | 237.4 | 240.0 | | 234.7 | 240.0 | 7.15 |
| Dissolved Oxygen (%) | - | 90.9 | 99.9 | 15.21 | 140.0 | 99.9 | 7.76 |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [illegible]

**Date:** 11/8/17

KGS

# Field Instrument Calibration Log

**Date:** 11/9/17 **Weather:** 40's

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** VAA **Serial Number:** 11J100112

| Parameters | Solution Expiration Date | Morning Calibration Time 720 | | Cal. Temperature °C | Afternoon Calibration Time 1530 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm$^c$) | 6/30/18 | 1.413 | 1.413 | 14.72° | 1.413 | 1.413 | 15.90° |
| pH (7) | 12/31/18 | 6.87 | 7.00 | | 7.01 | 7.00 | |
| pH (4) | 6/31/19 | 3.88 | 4.00 | | 4.06 | 4.00 | |
| pH (10) | 12/31/18 | 9.90 | 10.00 | | 10.01 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 238.1 | 240.0 | | 238.9 | 240.0 | |
| Dissolved Oxygen (%) | - | 106.2% | 100.0% | | 101.0% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 11/9/17

KGS

**Field Instrument Calibration Log**

**Date:** 11/9/17 **Weather:** mid 30s, sunny

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** JMF **Serial Number:** 15C103559

| Parameters | Solution Expiration Date | Morning Calibration Time 0735 | | Cal. Temperature °C | Afternoon Calibration Time _____ | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.499 | 1.413 | 5.16 | — | — | |
| pH (7) | 6/30/18 | 7.61 | 7.00 | | — | — | ☆UNIT FAILURE☆ |
| pH (4) | 2/2019 | 4.50 | 3.99 | | — | — | N/A |
| pH (10) | 10/18 | 9.03 | 10.00 | 6.23 | — | — | |
| ORP (240 mv) | 1/31/2022 | 237.8 | 240.0 | 4.64 | — | — | |
| Dissolved Oxygen (%) | - | 99.2 | 100.0 | 5.31 | — | — | |
| Dissolved Oxygen (mg/L) | - | | | | — | — | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** Jennifer Flood **Date:** 11/9/2017

KGS

# Field Instrument Calibration Log

**Date:** 11/10/17 **Weather:** 40's

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** UGA **Serial Number:** 11J100112

| Parameters | Solution Expiration Date | Morning Calibration Time 730 | | Cal. Temperature °C | Afternoon Calibration Time 1235 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.419 | 1.413 | 14.90° | 1.416 | 1.413 | 14.29° |
| pH (7) | 12/31/18 | 7.11 | 7.00 | | 6.89 | 7.00 | |
| pH (4) | 6/31/19 | 4.07 | 4.00 | | 4.07 | 4.00 | |
| pH (10) | 12/31/18 | 10.13 | 10.00 | | 9.93 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 241.7 | 240.0 | | 246.1 | 240.0 | |
| Dissolved Oxygen (%) | - | 101.0% | 100.0% | | 103.2% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 11/10/17

KGS

# Field Instrument Calibration Log

**Date:** 11/10/11 **Weather:** 30s, sunny

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 650 MDS

**Calibrated By:** JMF **Serial Number:** 08J100320

| Parameters | Solution Expiration Date | Morning Calibration Time 0845 | | Cal. Temperature °C | Afternoon Calibration Time 1320 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.702 | 1.414 | 5.99 | 1.434 | 1.413 | 3.96 |
| pH (7) | 6/30/18 | 7.04 | 7.00 | | 7.61 | 7.00 | |
| pH (4) | 2/2019 | 4.25 | 3.99 | | 3.85 | 4.00 | |
| pH (10) | 10/18 | 9.15 | 10.00 | | 9.04 | 10.05 | |
| ORP (240 mv) | 1/31/2022 | 260.5 | 239.9 | | 239.8 | 24.0 | |
| Dissolved Oxygen (%) | - | 96.8 | 100.0 | | 99.1 | 100.0 | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** Jennifer Flood **Date:** 11/10/11

KGS

# Field Instrument Calibration Log

**Date:** 11/13/17 **Weather:** 40's

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** [illegible] **Serial Number:** 11J 100 112

| Parameters | Solution Expiration Date | Morning Calibration Time 715 | | Cal. Temperature °C | Afternoon Calibration Time 1350 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm$^c$) | 6/30/18 | 1.379 | 1.413 | 13.99° | 1.427 | 1.413 | 15.01° |
| pH (7) | 12/31/18 | 7.21 | 7.00 | | 6.97 | 7.00 | |
| pH (4) | 6/31/19 | 4.19 | 4.00 | | 4.03 | 4.00 | |
| pH (10) | 12/31/18 | 10.13 | 10.00 | | 9.97 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 246.7 | 240.0 | | 236.1 | 240.0 | |
| Dissolved Oxygen (%) | - | 106.9° | 100.0% | | 103.7% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 11/13/17

KGS

# Field Instrument Calibration Log

**Date:** 11/13/17 **Weather:** cold, Rain

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 600XL

**Calibrated By:** Melissa Miller **Serial Number:** 08J100320

| Parameters | Solution Expiration Date | Morning Calibration Time 850 | | Cal. Temperature °C | Afternoon Calibration Time 1340 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 03/18 | 1453 | 1.413 | 0.52 | 1400 | 1413 | 4.67 |
| pH (7) | 06/18 | 7.37 | 7.00 | 0.72 | 7.13 | 7.00 | 2.00 |
| pH (4) | 02/19 | 3.97 | 4.00 | 0.33 | 4.08 | 4.00 | 1.95 |
| pH (10) | 10/18 | 9.92 | 10.00 | 0.60 | 9.89 | 10.00 | 2.24 |
| ORP (240 mv) | 01/22 | 255.2 | 240.0 | 1.66 | 223.4 | 240.0 | 3.57 |
| Dissolved Oxygen (%) | - | 124.3 | 100.0 | 4.84 | 96.0 | 100.0 | 3.79 |
| Dissolved Oxygen (mg/L) | - | 15.89 | 12.80 | 4.84 | 12.66 | 13.19 | 3.79 |
| Barometric Pressure (mmHg) | - | 760 | — | — | | | |

**Notes:**

**Signature:** Melissa A. Miller **Date:** 11/13/17

KGS

# Field Instrument Calibration Log

**Date:** 11/14/17 **Weather:** 40's

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** UAK **Serial Number:** 11J100112

| Parameters | Solution Expiration Date | Morning Calibration Time 745 | | Cal. Temperature °C | Afternoon Calibration Time 1345 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.420 | 1.413 | 13.99° | 1.412 | 1.413 | 14.29° |
| pH (7) | 12/31/18 | 7.06 | 7.09 | | 7.00 | 7.00 | |
| pH (4) | 6/31/19 | 4.09 | 4.09 | | 4.07 | 4.00 | |
| pH (10) | 12/31/18 | 10.21 | 10.00 | | 10.03 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 239.1 | 240.0 | | 237.7 | 240.0 | |
| Dissolved Oxygen (%) | - | 106.0% | 100.0% | | 101.1% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 11/14/17

KGS

# Field Instrument Calibration Log

**Date:** 11/14/17

**Weather:** high 30s, overcast

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling

**Instrument:** YSI 650 MDS

**Calibrated By:** JMF

**Serial Number:** 08J100320

| Parameters | Solution Expiration Date | Morning Calibration Time 0750 | | Cal. Temperature °C | Afternoon Calibration Time 1505 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 3/31/18 | 1.429 | 1.413 | 17.41 | 1.328 | 1.413 | 5.15 |
| pH (7) | 6/30/18 | 7.00 | 7.00 | 16.42 | 7.57 | 7.00 | 4.43 |
| pH (4) | 2/2019 | 4.31 | 3.99 | 16.14 | 4.99 | 3.99 | 4.49 |
| pH (10) | 10/18 | 8.72 | 10.00 | 16.11 | ~~10.00~~ 7.65 | 10.00 | 4.65 |
| ORP (240 mv) | 1/31/22 | 222.6 | 239.9 | 16.90 | ~~500~~ 256.3 | 240.0 | 4.67 |
| Dissolved Oxygen (%) | - | 110.7 | 99.8 | 14.66 | 90.9 | 100.0 | 4.73 |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** Jamie Ford

**Date:** 11/14/17

KGS

# Field Instrument Calibration Log

**Date:** 11/15/17 **Weather:** 40's

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** WA **Serial Number:** 17 100112

| Parameters | Solution Expiration Date | Morning Calibration Time 705 | | Cal. Temperature °C | Afternoon Calibration Time 1300 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.410 | 1.413 | 14.13° | 1.420 | 1.413 | 14.71° |
| pH (7) | 12/31/18 | 6.88 | 7.00 | | 6.99 | 7.00 | |
| pH (4) | 6/31/19 | 4.12 | 4.00 | | 4.03 | 4.00 | |
| pH (10) | 12/31/18 | 10.11 | 10.00 | | 9.92 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 239.7 | 240.0 | | 241.1 | 240.0 | |
| Dissolved Oxygen (%) | - | 102.3% | 100.0% | | 101.6% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 11/15/17

KGS

**Field Instrument Calibration Log**

**Date:** 11/15/17 **Weather:** 30s, partly sunny

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 650 MDS

**Calibrated By:** JMF **Serial Number:** 08J100320

| Parameters | Solution Expiration Date | Morning Calibration Time 0740 | | Cal. Temperature °C | Afternoon Calibration Time 1335 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 3/31/18 | 1.663 | 1.413 | 15.50 | 1.412 | 1.413 | 7.87 |
| pH (7) | 6/30/18 | 8.68 | 7.00 | 14.92 | 8.35 | 7.00 | 6.60 |
| pH (4) | 2/2019 | 4.34 | 3.99 | 14.59 | 4.98 | 3.99 | 6.61 |
| pH (10) | 10/18 | 8.08 | 10.00 | 15.50 | 7.45 | 10.00 | 6.28 |
| ORP (240 mv) | 1/31/2022 | 229.0 | 240.0 | 15.00 | 246.8 | 240.0 | 6.59 |
| Dissolved Oxygen (%) | - | 117.3 | 99.9 | 12.66 | 92.9 | 100.0 | 6.43 |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** Jennifer Flood **Date:** 11/15/17

KGS

# Field Instrument Calibration Log

**Date:** 11/16/17

**Weather:** high 30s, raining

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling

**Instrument:** YSI 650 MDS

**Calibrated By:** JMF

**Serial Number:** 08J100320

| Parameters | Solution Expiration Date | Morning Calibration Time 0745 | | Cal. Temperature °C | Afternoon Calibration Time 1310 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 3/31/2018 | 1.436 | 1.414 | 13.97 | 1.422 | 1.413 | 5.72 |
| pH (7) | 6/30/2018 | 8.81 | 7.00 | 14.04 | 7.69 | 7.00 | 5.37 |
| pH (4) | 2/2019 | 4.75 | 3.99 | 14.07 | 5.43 | 4.00 | 5.48 |
| pH (10) | 10/18 | 7.84 | 10.00 | 13.60 | 7.32 | 10.00 | 5.40 |
| ORP (240 mv) | 1/31/2022 | 234.9 | 240.0 | 13.72 | 242.4 | 240.0 | 5.57 |
| Dissolved Oxygen (%) | - | 117.8 | 99.9 | 12.39 | 101.2 | 100.0 | 5.88 |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** Jennifer Flood

**Date:** 11/16/17

KGS

# Field Instrument Calibration Log

**Date:** 11/16/17 **Weather:** 40's rain

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** [illegible] **Serial Number:** 15100112

| Parameters | Solution Expiration Date | Morning Calibration Time 655 | | Cal. Temperature °C | Afternoon Calibration Time 1225 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.431 | 1.413 | 13.29° | 1.412 | 1.413 | 14.39° |
| pH (7) | 12/31/18 | 6.89 | 7.00 | | 7.01 | 7.00 | |
| pH (4) | 6/31/19 | 4.21 | 4.00 | | 4.03 | 4.00 | |
| pH (10) | 12/31/18 | 9.73 | 10.00 | | 9.97 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 221.6 | 240.0 | | 238.9 | 240.0 | |
| Dissolved Oxygen (%) | - | 92.1% | 100.0% | | 99.4% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [illegible] **Date:** 11/16/17

KGS

# Field Instrument Calibration Log

**Date:** 11/17/17 **Weather:** 30's

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** [illegible] **Serial Number:** 11J100112

| Parameters | Solution Expiration Date | Morning Calibration Time 705 | | Cal. Temperature °C | Afternoon Calibration Time 1300 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.401 | 1.413 | 14.21° | 1.411 | 1.413 | 15.01° |
| pH (7) | 12/31/18 | 6.79 | 7.00 | | 7.09 | 7.00 | |
| pH (4) | 6/31/19 | 4.13 | 4.00 | | 4.03 | 4.00 | |
| pH (10) | 12/31/18 | 9.87 | 10.00 | | 10.02 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 237.1 | 240.0 | | 237.1 | 240.0 | |
| Dissolved Oxygen (%) | - | 106.9% | 100.0% | | 100.9% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 11/17/17

KGS

# Field Instrument Calibration Log

**Date:** 11/17/17 **Weather:** Cloudy, 39°F

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 650 MDS

**Calibrated By:** L Klosterman **Serial Number:** 08J100320

| Parameters | Solution Expiration Date | Morning Calibration Time 0830 | | Cal. Temperature °C | Afternoon Calibration Time 1530 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 3/31/18 | 1.351 | 1.413 | 8.61 | 1.419 | 1.413 | 15.89 |
| pH (7) | 6/30/18 | 9.10 | 7.00 | 8.13 | 8.08 | 7.00 | 15.21 |
| pH (4) | ~~4/30/19~~ | ~~3.99~~ 4.25 | 3.99 | 8.24 | 3.99 | 4.01 | 15.42 |
| pH (10) | 10/18 | 9.73 | 10.00 | 8.14 | 9.89 | 10.00 | 15.25 |
| ORP (240 mv) | 1/31/22 | 235.0 | 240.1 | 7.32 | 238.6 | 240.1 | 14.51 |
| Dissolved Oxygen (%) | - | 108.0 | 98.9 | 5.49 | 110.9 | 100.8 | 13.65 |
| Dissolved Oxygen (mg/L) | - | — | — | — | — | — | — |
| Barometric Pressure (mmHg) | - | 760 | — | 5.64 | 760 | — | 13.69 |

**Notes:**

**Signature:** [signature] **Date:** 11/17/17

KGS

# Field Instrument Calibration Log

**Date:** 11/20/17 **Weather:** 40's

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** WA **Serial Number:** 11J100112

| Parameters | Solution Expiration Date | Morning Calibration Time 7:45 | | Cal. Temperature °C | Afternoon Calibration Time 1300 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm$^c$) | 6/30/18 | 1.401 | 1.413 | 13.27° | 1.410 | 1.413 | 14.01° |
| pH (7) | 12/31/18 | 6.87 | 7.00 | | 7.02 | 7.00 | |
| pH (4) | 6/31/19 | 3.91 | 4.00 | | 4.06 | 4.00 | |
| pH (10) | 12/31/18 | 9.79 | 10.00 | | 9.97 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 239.2 | 240.0 | | 239.6 | 240.0 | |
| Dissolved Oxygen (%) | - | 101.1% | 100.0% | | 103.1% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** R **Date:** 11/20/17

KGS

**Field Instrument Calibration Log**

**Date:** 11/20/17

**Weather:** 1000 30s, cloudy

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling

**Instrument:** YSI 650 MDS

**Calibrated By:** JMF

**Serial Number:** 08J100320

| Parameters | Solution Expiration Date | Morning Calibration Time 0750 | | Cal. Temperature °C | Afternoon Calibration Time 1315 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 3/31/18 | 1.394 | 1.413 | 15.95 | 1.465 | 1.413 | 5.35 |
| pH (7) | 6/30/18 | 7.18 | 7.00 | 16.05 | 8.59 | 7.00 | 5.11 |
| pH (4) | 2/2019 | 4.39 | 3.99 | 15.95 | 5.07 | 4.00 | 5.34 |
| pH (10) | 10/18 | 7.53 | 10.00 | 15.80 | 7.32 | 10.00 | 5.42 |
| ORP (240 mv) | 1/31/2022 | 219.1 | 240.0 | 14.62 | 207.1 | 240.0 | 4.86 |
| Dissolved Oxygen (%) | - | — | — | — | 141.0 | 100.0 | 5.09 |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** Jennifer Flood

**Date:** 11/20/17

KGS

# Field Instrument Calibration Log

**Date:** 11/21/17

**Weather:** 40's

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling

**Instrument:** YSI 556 MPS 11J100112

**Calibrated By:** WA

**Serial Number:** 11J 100112

| Parameters | Solution Expiration Date | Morning Calibration Time 705 | | Cal. Temperature °C | Afternoon Calibration Time 1200 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.411 | 1.413 | 14.87° | 1.410 | 1.413 | 14.61° |
| pH (7) | 12/31/18 | 7.09 | 7.00 | | 6.97 | 7.00 | |
| pH (4) | 6/31/19 | 4.20 | 4.00 | | 3.97 | 4.00 | |
| pH (10) | 12/31/18 | 9.92 | 10.00 | | 10.02 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 242.3 | 240.0 | | 238.1 | 240.0 | |
| Dissolved Oxygen (%) | - | 112.0% | 100.0% | | 101.2% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature]

**Date:** 11/21/17

KGS

**Field Instrument Calibration Log**

**Date:** 11/21/17 **Weather:** 30s, sunny

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 650 MDS

**Calibrated By:** JMF **Serial Number:** ~~[illegible]~~ 11B101551

| Parameters | Solution Expiration Date | Morning Calibration Time 0745 | | Cal. Temperature °C | Afternoon Calibration Time 1215 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.349 | 1.413 | 16.42 | 1.256 | 1.413 | 9.45 |
| pH (7) | 8/2019 | 6.71 | 7.01 | 16.39 | 7.45 | 7.00 | 9.38 |
| pH (4) | 6/31/19 | 4.69 | 3.99 | 16.80 | 4.95 | 3.99 | 9.27 |
| pH (10) | 10/18 | 8.99 | 10.00 | 16.45 | 7.95 | 10.00 | 9.78 |
| ORP (240 mv) | 6/2022 | 234.5 | 240.0 | 15.90 | ~~[illegible]~~ 246.4 | 240.0 | 10.02 |
| Dissolved Oxygen (%) | - | 128.3 | 99.5 | 15.11 | 125.3 | 99.9 | 9.83 |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** Jennifer Flood **Date:** 11/21/17

KGS

# Field Instrument Calibration Log

**Date:** 11/27/17 **Weather:** 30's

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** MW **Serial Number:** 11J100112

| Parameters | Solution Expiration Date | Morning Calibration Time 705 | | Cal. Temperature °C | Afternoon Calibration Time 1445 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.418 | 1.413 | 13.20° | 1.411 | 1.413 | 14.01° |
| pH (7) | 12/31/18 | 7.09 | 7.00 | | 7.02 | 7.00 | |
| pH (4) | 6/31/19 | 4.13 | 4.00 | | 3.89 | 4.00 | |
| pH (10) | 12/31/18 | 10.11 | 10.00 | | 10.01 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 246.1 | 240.0 | | 238.7 | 240.0 | |
| Dissolved Oxygen (%) | - | 92.1% | 100.0% | | 101.9% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 11/27/17

KGS

# Field Instrument Calibration Log

**Date:** 11/27/17 **Weather:** 40°F cold / cloudy

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** Melissa Miller **Serial Number:** 16A104326

| Parameters | Solution Expiration Date | Morning Calibration Time 0910 | | Cal. Temperature °C | Afternoon Calibration Time 1335 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/2018 | 1.310 | 1.413 | 16.44 | 1.410 | 1.413 | 17.31 |
| pH (7) | 6/2018 | 7.26 | 7.00 | 19.74 | 7.03 | 7.00 | 20.13 |
| pH (4) | 6/2019 | 3.87 | 4.00 | 17.87 | 3.91 | 4.00 | 19.73 |
| pH (10) | 6/2019 | 9.65 | 10.00 | 16.91 | 9.89 | 10.00 | 17.27 |
| ORP (240 mv) | 6/2022 | 247.4 | 240.0 | 16.83 | 242.7 | 240.0 | 17.91 |
| Dissolved Oxygen (%) | - | 119.0 | 100 | 17.71 | 105.1 | 100 | 18.83 |
| Dissolved Oxygen (mg/L) | - | 11.36 | 9.56 | 17.71 | 10.23 | 9.57 | 18.83 |
| Barometric Pressure (mmHg) | - | 760 | — | | 760 | | |

**Notes:**

**Signature:** Melissa Miller **Date:** 11/27/17

KGS

# Field Instrument Calibration Log

**Date:** 11/27/17 **Weather:** Clr. , 35°F

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 650

**Calibrated By:** B.A **Serial Number:** 11B101551

| Parameters | Solution Expiration Date | Morning Calibration Time 0750 | | Cal. Temperature °C | Afternoon Calibration Time 1600 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | | 1.597 | 1.413 | 17.80 | 1.425 | 1.413 | 13.5 |
| pH (7) | | 8.29 | 7.00 | 17.72 | 7.05 | 7.00 | 12.75 |
| pH (4) | | 4.03 | 4.00 | 17.0 | 4.01 | 4.00 | 12.81 |
| pH (10) | | 10.04 | 10.00 | 16.08 | 10.00 | 10.00 | 12.92 |
| ORP (240 mv) | | 235.9 | 240.0 | 16.00 | 23.95 | 240.0 | 12.95 |
| Dissolved Oxygen (%) | - | 94.3 | ~~100~~ 99.5 | 15.95 | 97.3 | 99.3 | 13.21 |
| Dissolved Oxygen (mg/L) | - | | | | | | 13.13 |
| Barometric Pressure (mmHg) | - | 749 | | | 749 | 749 | |

**Notes:**

**Signature:** [signature] **Date:** 11/27/17

KGS

# Field Instrument Calibration Log

**Date:** 11/28/17 **Weather:** clear, 19°F

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 650

**Calibrated By:** Brett Anchukaitis **Serial Number:** 11B101551

| Parameters | Solution Expiration Date | Morning Calibration Time 0650 | | Cal. Temperature °C | Afternoon Calibration Time 1300 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | | 1.425 | 1.413 | 16.95 | 1.415 | 1.413 | 12.62 |
| pH (7) | | 7.49 | 7.00 | 16.82 | 7.01 | 7.00 | 11.98 |
| pH (4) | | 4.05 | 4.00 | 16.79 | 4.02 | 4.00 | 11.95 |
| pH (10) | | 10.25 | 10.00 | 16.78 | 10.01 | 10.00 | 11.97 |
| ORP (240 mv) | | 237.4 | 240.0 | 16.80 | 239.5 | 240.0 | 11.90 |
| Dissolved Oxygen (%) | - | 93.7 | 99.2 | 16.92 | 87.5 | 98.7 | 12.00 |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | 740 | 740 | 16.92 | 740 | 740 | 12.00 |

**Notes:**

**Signature:** [signature] **Date:** 11/28/17

KGS

# Field Instrument Calibration Log

**Date:** 11/28/17 **Weather:** 20°F cold

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** Melissa Miller **Serial Number:** 16A104326

| Parameters | Solution Expiration Date | Morning Calibration Time 0810 | | Cal. Temperature °C | Afternoon Calibration Time 1300 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/2018 | 1.412 | 1.413 | 13.43 | 1.401 | 1.413 | 15.71 |
| pH (7) | 6/2018 | 6.78 | 7.00 | 14.77 | 6.97 | 7.00 | 16.83 |
| pH (4) | 6/2019 | 3.93 | 4.00 | 14.97 | 3.98 | 4.00 | 16.99 |
| pH (10) | 6/2019 | 9.88 | 10.00 | 13.56 | 9.91 | 10.00 | 15.71 |
| ORP (240 mv) | 6/2022 | 248.9 | 240 | 11.95 | 247.1 | 240 | 13.17 |
| Dissolved Oxygen (%) | - | 127.6 | 100 | 2.23 | 105 | 100 | 7.68 |
| Dissolved Oxygen (mg/L) | - | 17.57 | 13.77 | 2.23 | 13.89 | 13.55 | 7.68 |
| Barometric Pressure (mmHg) | - | 760 | — | 2.23 | 760 | — | 7.68 |

**Notes:**

**Signature:** Melissa Miller **Date:** 11/28/17

KGS

# Field Instrument Calibration Log

**Date:** 11/28/17 **Weather:** 20°

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** VA **Serial Number:** 15100112

| Parameters | Solution Expiration Date | Morning Calibration Time 700 | | Cal. Temperature °C | Afternoon Calibration Time 1345 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.429 | 1.413 | 12.92° | 1.423 | 1.413 | 13.01° |
| pH (7) | 12/31/18 | 6.81 | 7.00 | | 7.09 | 7.00 | |
| pH (4) | 6/31/19 | 3.89 | 4.00 | | 3.92 | 4.00 | |
| pH (10) | 12/31/18 | 9.82 | 10.00 | | 10.02 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 246.1 | 240.0 | | 236.1 | 240.0 | |
| Dissolved Oxygen (%) | - | 127.0% | 100.0% | | 103.1% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 11/28/17

KGS

# Field Instrument Calibration Log

**Date:** 11/29/17 **Weather:** 40's

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** KGA **Serial Number:** 11J100112

| Parameters | Solution Expiration Date | Morning Calibration Time 655 | | Cal. Temperature °C | Afternoon Calibration Time 1320 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.410 | 1.413 | 14.82° | 1.410 | 1.413 | 15.90° |
| pH (7) | 12/31/18 | 7.15 | 7.00 | | 7.03 | 7.09 | |
| pH (4) | 6/31/19 | 3.89 | 4.00 | | 4.00 | 4.00 | |
| pH (10) | 12/31/18 | 10.03 | 10.00 | | 10.02 | 10.09 | |
| ORP (240 mv) | 1/31/22 | 232.1 | 240.0 | | 239.7 | 240.0 | |
| Dissolved Oxygen (%) | - | 96.1% | 100.0% | | 99.9% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 11/29/17

KGS

# Field Instrument Calibration Log

**Date:** 11/30/17 **Weather:** 20's

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** MGA **Serial Number:** 11J100112

| Parameters | Solution Expiration Date | Morning Calibration Time 650 | | Cal. Temperature °C | Afternoon Calibration Time 1425 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/30/18 | 1.397 | 1.413 | 12.97° | 1.411 | 1.413 | 13.26° |
| pH (7) | 12/31/18 | 7.09 | 7.00 | | 7.02 | 7.00 | |
| pH (4) | 6/31/19 | 4.02 | 4.00 | | 4.03 | 4.00 | |
| pH (10) | 12/31/18 | 9.87 | 10.00 | | 9.97 | 10.00 | |
| ORP (240 mv) | 1/31/22 | 236.7 | 240.0 | | 236.1 | 240.0 | |
| Dissolved Oxygen (%) | - | 98.6% | 100.1% | | 102.1% | 100.0% | |
| Dissolved Oxygen (mg/L) | - | | | | | | |
| Barometric Pressure (mmHg) | - | | | | | | |

**Notes:**

**Signature:** [signature] **Date:** 11/30/17

KGS

# Turbidity Instrument Calibration Log

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling
**Calibrated By:** [illegible]

**Instrument:** LaMotte 2020WE
**Serial Number:** ~~208~~ 8249-4116

| Date | Pre-Cal 0 NTU AM | Post-Cal 0 NTU AM | Pre-Cal 10 NTU AM | Post-Cal 10 NTU AM | Pre-Cal 0 NTU PM | Post-Cal 0 NTU PM | Pre-Cal 10 NTU PM | Post-Cal 10 NTU PM |
|---|---|---|---|---|---|---|---|---|
| 11/3/17 | 0.00 | 0.00 | 10.07 | 10.00 | 0.09 | ~~10~~ 0.00 | 10.07 | 10.00 |
| 11/6/17 | 0.07 | 0.00 | 10.11 | 10.00 | 0.07 | 0.00 | 10.09 | 10.00 |
| 11/7/17 | 0.01 | 0.00 | 10.20 | 10.00 | 0.03 | 0.00 | 10.01 | 10.00 |
| 11/8/17 | 0.09 | 0.00 | 10.19 | 10.00 | 0.01 | 0.00 | 10.13 | 10.00 |
| 11/9/17 | 0.11 | 0.00 | 10.03 | 10.00 | 0.03 | 0.00 | 10.09 | 10.00 |
| 11/10/17 | 0.07 | 0.00 | 9.92 | 10.00 | 0.02 | 0.00 | 10.10 | 10.00 |
| 11/13/17 | 0.13 | 0.00 | 10.14 | 10.00 | 0.01 | 0.00 | 9.79 | 10.00 |
| 11/14/17 | 0.09 | 0.00 | 10.03 | 10.00 | 0.09 | 0.00 | 9.89 | 10.00 |

**Signature:** [illegible]

**Date:** 11/14/17

KGS

# Turbidity Instrument Calibration Log

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling
**Calibrated By:** Melissa Miller

**Instrument:** Lamotte 2020 we
**Serial Number:** 3461-2313

| Date | Pre-Cal 0 NTU AM | Post-Cal 0 NTU AM | Pre-Cal 10 NTU AM | Post-Cal 10 NTU AM | Pre-Cal 0 NTU PM | Post-Cal 0 NTU PM | Pre-Cal 10 NTU PM | Post-Cal 10 NTU PM |
|---|---|---|---|---|---|---|---|---|
| 11/13/17 835/1335 | 0.0 | 0.0 | 7.50 | 9.99 | 0.08 | 0.05 | 5.50 | 8.35 |
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**Signature:** Melissa Miller

**Date:** 11/13/17

KGS

# Turbidity Instrument Calibration Log

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling
**Calibrated By:** JMF

**Instrument:** LaMotte 2020 we
**Serial Number:** 3461-2313

| Date | Pre-Cal ~~0~~ 1 NTU AM | Post-Cal ~~0~~ 1 NTU AM | Pre-Cal 10 NTU AM | Post-Cal 10 NTU AM | Pre-Cal ~~0~~ 1 NTU PM | Post-Cal ~~0~~ 1 NTU PM | Pre-Cal 10 NTU PM | Post-Cal 10 NTU PM |
|---|---|---|---|---|---|---|---|---|
| 11/6/17 | | | | | 0.98 | 1.00 | 9.96 | 10.00 |
| 11/7/17 | 1.12 | 1.00 | 9.03 | 10.00 | 1.24 | 1.00 | 8.98 | 10.00 |
| 11/8/17 | 1.20 | 1.00 | 8.07 | 10.00 | 1.16 | 1.00 | 7.50 | 10.00 |
| 11/9/17 | 1.13 | 1.00 | 9.02 | 10.00 | | | ~~8.54~~ | ~~10.00~~ |
| 11/10/17 | 1.21 | 1.00 | 9.90 | 10.00 | 1.18 | 1.00 | 8.54 | 10.00 |
| 11/14/17 | 1.29 | 1.00 | 11.7 | 10.00 | 1.05 | 1.00 | 9.12 | 10.00 |
| 11/15/17 | 1.28 | 1.00 | 9.63 | 10.00 | 1.19 | 1.00 | 8.01 | 10.00 |
| 11/16/17 | 1.28 | 1.04 | 8.53 | 10.00 | | | 8.72 | 10.00 |

1.64
could not get lower

**Signature:** [signature]

**Date:** 11/16/17

KGS

# Turbidity Instrument Calibration Log

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling
**Calibrated By:** L Klosterman

**Instrument:** LaMotte
**Serial Number:** 3461-2313

| Date | Pre-Cal 0 NTU AM | Post-Cal 0 NTU AM | Pre-Cal 10 NTU AM | Post-Cal 10 NTU AM | Pre-Cal 0 NTU PM | Post-Cal 0 NTU PM | Pre-Cal 10 NTU PM | Post-Cal 10 NTU PM |
|---|---|---|---|---|---|---|---|---|
| 11/17/17 | 0.01 | 0.00 | 11.01 | 10.00 | 0.01 | 0.00 | 10.30 | 10.00 |
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**Signature:** [illegible]

**Date:** 11/17/17

KGS

# Turbidity Instrument Calibration Log

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling
**Calibrated By:** JMF

**Instrument:** LaMotte
**Serial Number:** 3461

| Date | Pre-Cal ~~0~~ 1 NTU AM | Post-Cal ~~0~~ 1 NTU AM | Pre-Cal 10 NTU AM | Post-Cal 10 NTU AM | Pre-Cal ~~0~~ 1 NTU PM | Post-Cal ~~0~~ 1 NTU PM | Pre-Cal 10 NTU PM | Post-Cal 10 NTU PM |
|---|---|---|---|---|---|---|---|---|
| 11/20/17 | 1.48 | 1.16 | 10.06 | 10.00 | 1.23 | 1.00 | 9.55 | 10.00 |
| 11/21/17 | 1.40 | 1.07 | 8.56 | 10.00 | 1.26 | 1.00 | 7.95 | 10.00 |
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**Signature:** Jennifer Flood

**Date:** 11/20/17

KGS

# Turbidity Instrument Calibration Log

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling
**Calibrated By:** Brett Anchukaitis

**Instrument:** LaMotte 2020 Turbidimeter
**Serial Number:** 3461-2313

| Date | Pre-Cal 0 NTU AM | Post-Cal 0 NTU AM | Pre-Cal 10 NTU AM | Post-Cal 10 NTU AM | Pre-Cal 0 NTU PM | Post-Cal 0 NTU PM | Pre-Cal 10 NTU PM | Post-Cal 10 NTU PM |
|---|---|---|---|---|---|---|---|---|
| 11/27/17 | 0.65 | 0.00 | 11.25 | 10.00 | 0.05 | 0.00 | 10.10 | 10.00 |
| 11/28/17 | 0.87 | 0.00 | 10.65 | 10.00 | 0.12 | 0.00 | 11.2 | 10.00 |
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| | | | | | | | | |

**Signature:** Brett Anchukaitis

**Date:** 11/28/17

KGS

# Field Instrument Calibration Log

**Date:** 11/29/17 **Weather:** 50°F

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling **Instrument:** YSI 556 MPS

**Calibrated By:** Melissa Miller **Serial Number:** 16A104326

| Parameters | Solution Expiration Date | Morning Calibration Time 0740 | | Cal. Temperature °C | Afternoon Calibration Time 1355 | | Cal. Temperature °C |
|---|---|---|---|---|---|---|---|
| Specific Conductivity (1.413 µS/cm°) | 6/2018 | 1454 | 1413 | 13.65 | 1381 | 1413 | 11.09 |
| pH (7) | 6/2018 | 6.85 | 7.00 | 14.56 | 6.73 | 7.00 | 11.68 |
| pH (4) | 6/2019 | 4.25 | 4.00 | 14.93 | 4.13 | 4.00 | 11.62 |
| pH (10) | 6/2019 | 9.75 | 10.00 | 14.27 | 9.91 | 10.0 | 11.65 |
| ORP (240 mv) | 6/2022 | 243.0 | 240.0 | 13.62 | 240.6 | 240.0 | 10.97 |
| Dissolved Oxygen (%) | - | 83.9 | 100.0 | 13.75 | 82.3 | | 10.29 |
| Dissolved Oxygen (mg/L) | - | 8.63 | 10.30 | 13.75 | 9.23 | | 10.29 |
| Barometric Pressure (mmHg) | - | 760 | — | 13.75 | 760 | — | 10.29 |

**Notes:**

**Signature:** Melissa A. Miller **Date:** 11/29/17

KGS

# Turbidity Instrument Calibration Log

**Project/Site Name:** Shepley's Landfill Fall 2017 Sampling
**Calibrated By:** Melissa Miller

**Instrument:** Hach 2100 Q
**Serial Number:** 11080C011551

| | AM | | | | PM | | | |
|---|---|---|---|---|---|---|---|---|
| Date | Pre/Post - Cal 10 NTU | Pre/Post - Cal 20 NTU | Pre/Post - Cal 100 NTU | Pre/Post - Cal 800 NTU | Pre/Post - Cal 10 NTU | Pre/Post - Cal 20 NTU | Pre/Post - Cal 100 NTU | Pre/Post - Cal 800 NTU |
| 11/27/17 | 10.8 | 18.9 | 97.3 | 794 | 9.39 | 20.4 | 102.0 | 820 |
| 11/28/17 | 10.4 | 19.1 | 98.7 | 792 | 10.00 | 19.7 | 97.3 | 815 |
| 11/29/17 | 10.3 | 20.4 | 103 | 779 | 10.50 | 19.2 | 95.8 | 785 |
| | | | | | | | | |
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| | | | | | | | | |
| | | | | | | | | |

**Signature:** [signature]

**Date:** 11/29/17

# Attachment 2

**Piezometer Construction Logs (SHP-2016-01A/B to SHP-2016-05A/B)**

# KOMAN Government Solutions, LLC
# SOIL BORING LOG

| | |
|---|---|
| Project: Fort Devens/ Shepley's Hill Landfill | Boring No.: SHP-16-01 |
| Project No.: 1072-003 | Drilling Co.: Cascade |
| Address: Cook Street, Ayer, MA | Driller: J. Graglia |
| Logger: L. Klosterman | Drilling Method: Sonic |
| Dates: 7/19/2016 -7/22/16 | Drilling Equip: 6", 4" Casing, Pushahead |
| Total Boring Depth: 105 feet bgs | Static Water: ≈ 17 feet bgs |

| Core Section | Recovery (ft) | Shallow A | Deep B | Soil Profile | GEOLOGIC LOG |
|---|---|---|---|---|---|
| 0-5' | 4.0 | | | | Dry, brown, fine to medium SAND. Less than 0-5% fine Gravel, trace pebbles |
| 5-20' | 4.0 | | | | 5-10': Dry, tan to brown, medium SAND. |
| | | | | | 10-15': Moist, tan to gray, fine SAND, some red coarse Sand |
| | | | | | 15-20': Moist, brown, fine SAND (hydrogen sulfide odor) |
| 20-25' | 8.0 | | | | Wet, brown, medium SAND |
| 25-30' | 5.0 | | | | Wet, brown, medium to coarse SAND |
| 30-35' | 3.5 | | | | Wet, brown, coarse SAND and GRAVEL |
| 35-40' | 3.0 | | | | Wet, gray, medium SAND |
| 40-45' | 3.5 | | | | Wet, gray, medium SAND |
| 45-50' | 3.5 | | | | Wet, gray, medium SAND, poorly graded |

Notes:

1. Nested monitoring well installed with standpipe. Screened 13-23 feet and 75-85 feet below existing ground surface.
2. PID readings not used for soil characterization of metals.

Soil Characterization

| | | |
|---|---|---|
| Top soil | Primarily Clay | Gravel |
| Primarily Sand | Till | Heterogeneous Mixture |
| Primarily Silt | Shale | Bedrock |

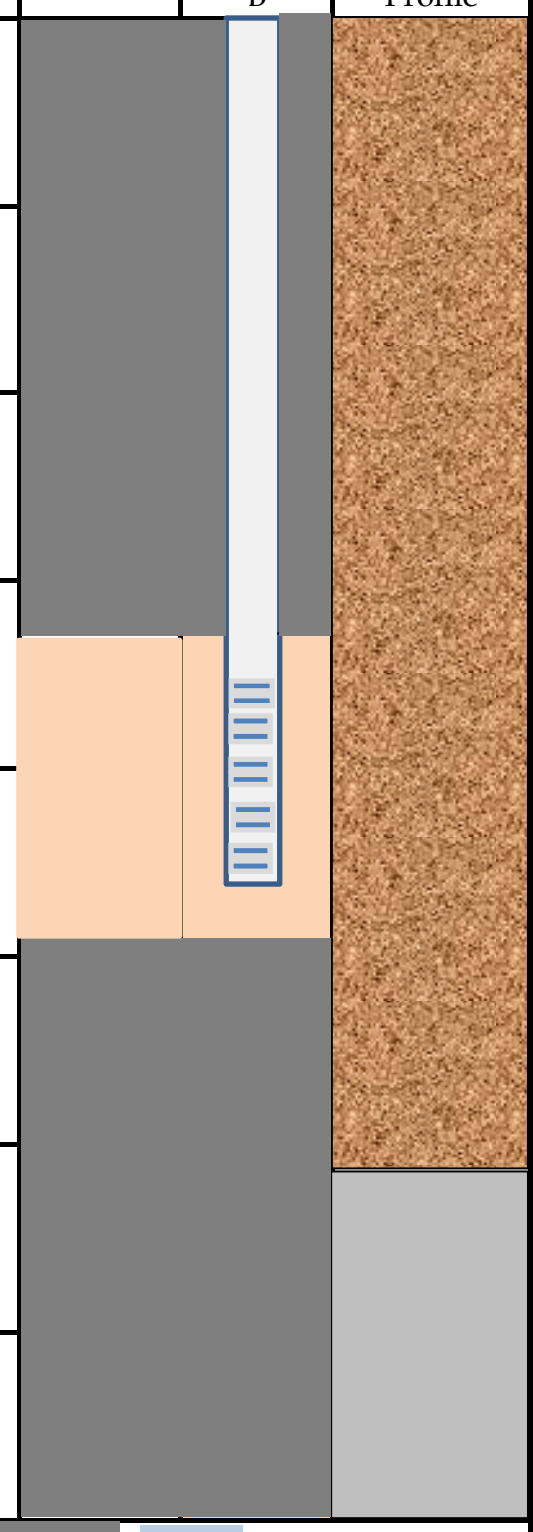
KOMAN Government Solutions, LLC
160 East Main Street
Westboro, MA 01581

# KOMAN Government Solutions, LLC
# SOIL BORING LOG

| | |
|---|---|
| Project: Fort Devens/ Shepley's Hill Landfill | Boring No.: SHP-16-01 |
| Project No.: 1072-003 | Drilling Co.: Cascade |
| Address: Cook Street, Ayer, MA | Driller: J. Graglia |
| Logger: L. Klosterman | Drilling Method: Sonic |
| Dates: 7/19/2016 -7/22/16 | Drilling Equip: 6", 4" Casing, Pushahead |
| Total Boring Depth: 105 feet bgs | Static Water: ≈ 17 feet bgs |

| Core Section | Recovery (ft) | Shallow A | Deep B | Soil Profile | GEOLOGIC LOG |
|---|---|---|---|---|---|
| 50-55' | 3.5 | | | | Wet, gray, medium SAND, well-graded |
| 55-60' | 3.5 | | | | Wet, gray, medium SAND, well-graded |
| 60-70' | 7.0 | | | | Wet, gray, fine to medium SAND |
| 70-80' | 8.0 | | | | Wet, gray, fine SAND and medium SAND |
| 80-90' | 7.0 | | | | 80-85': Moist, gray, fine SAND<br>85-90': Wet, gray, medium SAND |
| 90-100' | 3.0 | | | | Wet, gray, fine to medium SAND |
| 100-102' | 2.0 | | | | 101-102': Wet, gray TILL with Sand, Silt and Gravel<br>102': BEDROCK |
| 105' | N/a | | | | 105': End of Boring |

Notes: Sand Bentonite Grout



Top soil
Primarily Sand
Primarily Silt

Primarily Clay
Till
Shale

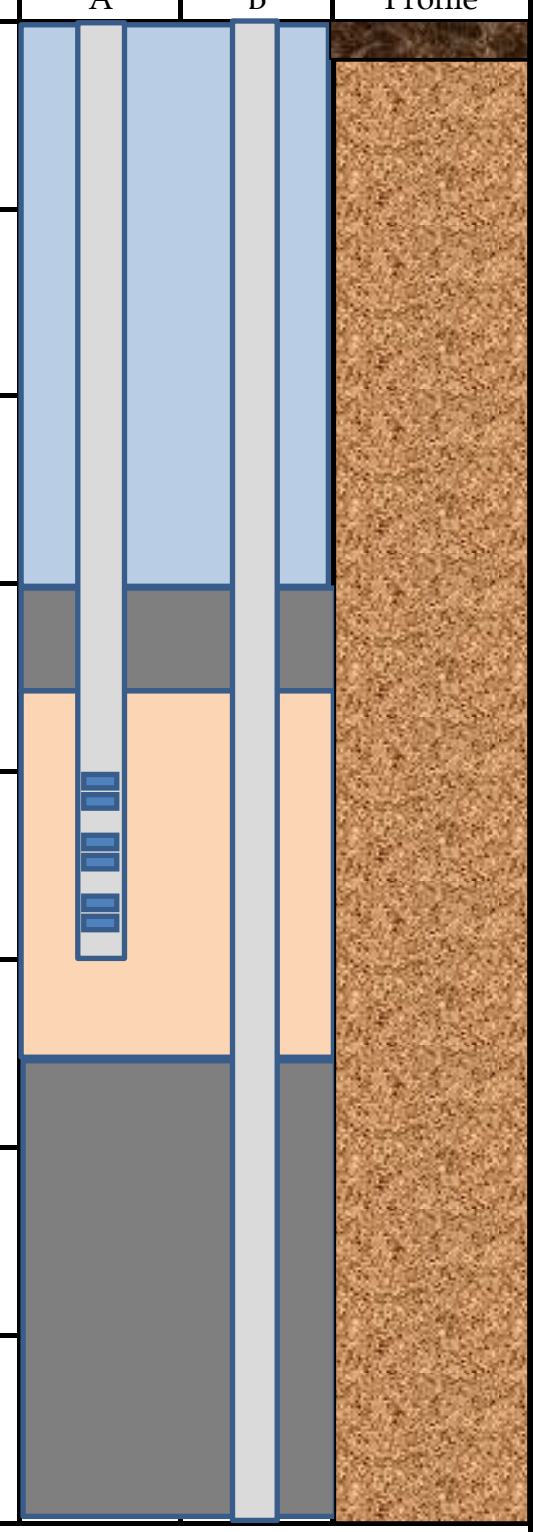
Gravel
Heterogeneous Mixture
Bedrock

KOMAN Government Solutions, LLC
160 East Main Street
Westboro, MA 01581

# KOMAN Government Solutions, LLC
# SOIL BORING LOG

| | |
|---|---|
| Project: Fort Devens/ Shepley's Hill Landfill | Boring No.: SHP-16-02 |
| Project No.: 1072-003 | Drilling Co.: Cascade |
| Address: Cook Street, Ayer, MA | Driller: J. Graglia |
| Logger: L. Klosterman | Drilling Method: Sonic |
| Dates: 8/10/16 - 8/15/16 | Drilling Equip: 6", 4" Casing, Pushahead |
| Total Boring Depth: 115 feet bgs | Static Water: ≈ 16 feet bgs |

| Core Section | Recovery (ft) | Shallow A | Deep B | Soil Profile | GEOLOGIC LOG |
|---|---|---|---|---|---|
| 0-5' | 4.0 | | | | Dry, tan to brown, fine to medium SAND |
| 5-10' | 4.5 | | | | Dry, tan, fine to medium SAND, well sorted |
| 10-15' | 5.0 | | | | 10-14': Dry, tan, medium SAND with trace cobbles<br>14-15': Moist, light brown, medium SAND. Some coarse SAND |
| 15-20' | 0.5 | | | | Wet, brown, medium SAND |
| 20-25' | 2.5 | | | | Wet, brown, medium to coarse SAND |
| 25-30' | 0.0 | | | | No recovery |
| 30-35' | 3.0 | | | | Wet, brown, medium to coarse SAND with some Fines |
| 35-40' | 0.0 | | | | No recovery |



Notes:

1. Nested monitoring well installed with standpipe. Screen 20-25 feet and 80-85 feet below existing ground surface.
2. PID readings not used for soil characterization of metals.

Soil Characterization

- Top soil
- Primarily Sand
- Primarily Silt
- Primarily Clay
- Till
- Shale
- Gravel
- Heterogeneous Mixture
- Bedrock

KOMAN Government Solutions, LLC
160 East Main Street
Westboro, MA 01581

**KOMAN Government Solutions, LLC**
**SOIL BORING LOG**

| | |
|---|---|
| Project: Fort Devens/ Shepley's Hill Landfill | Boring No.: SHP-16-02 |
| Project No.: 1072-003 | Drilling Co.: Cascade |
| Address: Cook Street, Ayer, MA | Driller: J. Graglia |
| Logger: L. Klosterman | Drilling Method: Sonic |
| Dates: 8/10/16 - 8/15/16 | Drilling Equip: 6", 4" Casing, Pushahead |
| Total Boring Depth: 115 feet bgs | Static Water: ≈ 16 feet bgs |

| Core Section | Recovery (ft) | Interval (ft) | PID (ppm) | Soil Profile | GEOLOGIC LOG |
|---|---|---|---|---|---|
| 40-45' | 3.0 | | | | Wet, brown to gray, coarse SAND |
| 45-50' | 0.0 | | | | No recovery |
| 50-55' | 2.0 | | | | Wet, brown to gray, medium SAND |
| 55-60' | 0.5 | | | | Wet, tan to gray, medium SAND |
| 60-65' | 3.5 | | | | Wet, tan to gray, medium SAND |
| 65-70' | 0.5 | | | | Wet, gray, medium SAND |
| 70-75' | 3.5 | | | | Wet, gray, medium SAND |
| 75-80' | 0.5 | | | | Wet, gray, medium SAND |

Notes:

Top soil
Primarily Sand
Primarily Silt
Primarily Clay
Till
Shale
Gravel
Heterogeneous Mixture
Bedrock

KOMAN Government Solutions, LLC
160 East Main Street
Westboro, MA 01581

**KOMAN Government Solutions, LLC**
**SOIL BORING LOG**

| | |
|---|---|
| Project: Fort Devens/ Shepley's Hill Landfill | Boring No.: SHP-16-02 |
| Project No.: 1072-003 | Drilling Co.: Cascade |
| Address: Cook Street, Ayer, MA | Driller: J. Graglia |
| Logger: L. Klosterman | Drilling Method: Sonic |
| Dates: 8/10/16 - 8/15/16 | Drilling Equip: 6", 4" Casing, Pushahead |
| Total Boring Depth: 115 feet bgs | Static Water: ≈ 16 feet bgs |

| Core Section | Recovery (ft) | Shallow A | Deep B | Soil Profile | GEOLOGIC LOG |
|---|---|---|---|---|---|
| 80-85' | 4.0 | | | | Wet, gray, medium to coarse SAND |
| 85-90' | 2.0 | | | | Wet, gray, fine to medium SAND |
| 90-95' | 3.0 | | | | Wet, gray, fine to medium SAND |
| 95-100' | 0.0 | | | | No recovery |
| 100-105' | 2.5 | | | | Wet, gray, fine to medium SAND |
| 105-110' | 2.5 | | | | Wet, brown to gray, medium SAND |
| 110-115' | 2.5 | | | | 110-113': Wet, gray, TILL<br>113': BEDROCK<br>115': End of Boring |

Notes: Sand Bentonite Grout

Top soil
Primarily Sand
Primarily Silt
Primarily Clay
Till
Shale
Gravel
Heterogeneous Mixture
Bedrock

KOMAN Government Solutions, LLC
160 East Main Street
Westboro, MA 01581

# KOMAN Government Solutions, LLC
# SOIL BORING LOG

| | |
|---|---|
| Project: Fort Devens/ Shepley's Hill Landfill | Boring No.: SHP-16-03 |
| Project No.: 1072-003 | Drilling Co.: Cascade |
| Address: Cook Street, Ayer, MA | Driller: J. Graglia |
| Logger: L. Klosterman | Drilling Method: Sonic |
| Dates: 7/26/16 - 7/29/16 | Drilling Equip: 6", 4" Casing, Pushahead |
| Total Boring Depth: 115.5 feet bgs | Static Water: ≈ 10.5 feet bgs |

| Core Section | Recovery (ft) | Shallow A | Deep B | Soil Profile | GEOLOGIC LOG |
|---|---|---|---|---|---|
| 0-5' | 4.0 | | | | Dry, tan, medium to fine SAND, well sorted |
| 5-10' | 4.5 | | | | 5-9': Dry, tan, fine SAND<br>9-10': Moist, tan, medium, SAND |
| 10-15' | 2.0 | | | | Moist to Wet, brown, medium SAND, well sorted |
| 15-20' | 1.0 | | | | Wet, tan, medium SAND, well sorted |
| 20-25' | 4.0 | | | | Wet, tan to brown, medium SAND |
| 25-30' | 3.0 | | | | Wet, brown to gray, medium SAND with some pebbles (1-2") |
| 30-35' | 3.5 | | | | Wet, gray, medium SAND |
| 35-40' | 3.0 | | | | Wet, gray, coarse to medium SAND, some pebbles (1-2") |

Notes:

1. Nested monitoring wells installed with standpipe. Screened 20-25 feet and 80-85 feet below existing ground surface.
2. PID Readings not collected for soil characterization of metals.

Soil Characterization

| | | |
|---|---|---|
| Top soil | Primarily Clay | Gravel |
| Primarily Sand | Till | Heterogeneous Mixture |
| Primarily Silt | Shale | Bedrock |

KOMAN Government Solutions, LLC
160 East Main Street
Westboro, MA 01581

**KOMAN Government Solutions, LLC**
**SOIL BORING LOG**

| | |
|---|---|
| Project: Fort Devens/ Shepley's Hill Landfill | Boring No.: SHP-16-03 |
| Project No.: 1072-003 | Drilling Co.: Cascade |
| Address: Cook Street, Ayer, MA | Driller: J. Graglia |
| Logger: L. Klosterman | Drilling Method: Sonic |
| Dates: 7/26/16 - 7/29/16 | Drilling Equip: 6", 4" Casing, Pushahead |
| Total Boring Depth: 115.5 feet bgs | Static Water: ≈ 10.5 feet bgs |

| Core Section | Recovery (ft) | Shallow A | Deep B | Soil Profile | GEOLOGIC LOG |
|---|---|---|---|---|---|
| 40-45' | 3.0 | | | | Wet, gray, medium SAND |
| 45-55' | 5.0 | | | | Wet, gray to brown, coarse SAND, some Gravel |
| 55-65' | 3.5 | | | | Wet, gray, medium SAND |
| 65-75' | 3.0 | | | | 65-70': Wet, gray, medium SAND, well sorted<br>Wet, gray, medium SAND with trace Silt<br>0-75 |
| 75-85' | 3.0 | | | | 75-78.5': Wet, gray, coarse SAND and GRAVEL, trace Silt<br>78.5-82': Wet, gray, medium SAND<br>82-85': Wet, gray, medium to coarse SAND |
| 85-95' | 2.0 | | | | Wet, gray, medium to coarse SAND |
| 95-100' | N/a | | | | Wet, gray, fine to medium SAND |
| 100-105' | N/a | | | | Wet, gray, fine to medium SAND |

Notes:

Top soil
Primarily Sand
Primarily Silt

Primarily Clay
Till
Shale

Gravel
Heterogeneous Mixture
Bedrock

KOMAN Government Solutions, LLC
160 East Main Street
Westboro, MA 01581

# KOMAN Government Solutions, LLC
# SOIL BORING LOG

| | |
|---|---|
| Project: Fort Devens/ Shepley's Hill Landfill | Boring No.: SHP-16-03 |
| Project No.: 1072-003 | Drilling Co.: Cascade |
| Address: Cook Street, Ayer, MA | Driller: J. Graglia |
| Logger: L. Klosterman | Drilling Method: Sonic |
| Dates: 7/26/16 - 7/29/16 | Drilling Equip: 6", 4" Casing, Pushahead |
| Total Boring Depth: 115.5 feet bgs | Static Water: ≈ 10.5 feet bgs |

| Core Section | Recovery (ft) | Shallow A | Deep B | Soil Profile | GEOLOGIC LOG |
|---|---|---|---|---|---|
| 105-110' | N/a | | | | Wet, gray, fine to medium SAND with some Silt and Clay |
| 110.5-113' | N/a | | | | Wet, light to dark gray, TILL with Clay and crushed/weathered Bedrock, unsorted to poorly sorted |
| 113-115.5' | N/a | | | | 113': Wet, gray, weathered BEDROCK and BEDROCK<br>115.5': End of Boring |

Notes: Sand | Bentonite | Grout

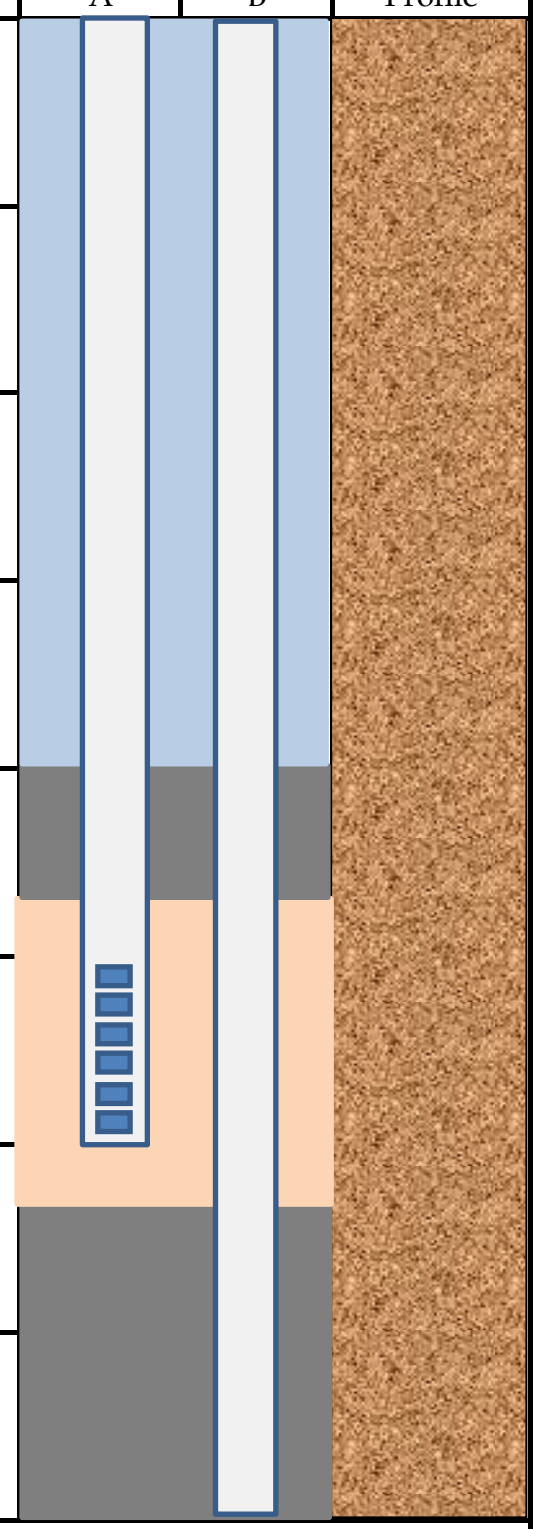
Top soil
Primarily Sand
Primarily Silt
Primarily Clay
Till
Shale
Gravel
Heterogeneous Mixture
Bedrock

KOMAN Government Solutions, LLC
160 East Main Street
Westboro, MA 01581

# KOMAN Government Solutions, LLC
# SOIL BORING LOG

| | |
|---|---|
| Project: Fort Devens/ Shepley's Hill Landfill | Boring No.: SHP-16-04 |
| Project No.: 1072-003 | Drilling Co.: Cascade |
| Address: Cook Street, Ayer, MA | Driller: J. Graglia |
| Logger: L. Klosterman | Drilling Method: Sonic |
| Dates: 8/5/2016 -8/10/16 | Drilling Equip: 6", 4" Casing, Pushahead |
| Total Boring Depth: 116.0 feet bgs | Static Water: ≈ 15 feet bgs |

| Core Section | Recovery (ft) | Shallow A | Deep B | Soil Profile | GEOLOGIC LOG |
|---|---|---|---|---|---|
| 0-5' | 5.0 | | | | Dry, light brown, medium to fine SAND |
| 5-10' | 5.0 | | | | Dry, light brown and tan, medium SAND |
| 10-15' | 5.0 | | | | Dry, light brown, medium SAND |
| 15-20' | 3.0 | | | | Wet, brown, medium SAND |
| 20-25' | 2.0 | | | | Wet, brown, medium SAND |
| 25-30' | 2.0 | | | | Wet, brown, coarse to medium SAND |
| 30-35' | 5.0 | | | | Wet, brown, coarse to medium SAND with some rounded pebbles (1-3") |
| 35-40' | 3.0 | | | | Wet, brown to gray, coarse SAND |



Notes:

1. Nested monitoring wells installed with standpipe. Screened 25-30 feet and 85-90 feet below existing ground surface.
2. PID Readings not collected for soil characterization of metals.

Soil Characterization

- Top soil
- Primarily Sand
- Primarily Silt
- Primarily Clay
- Till
- Shale
- Gravel
- Heterogeneous Mixture
- Bedrock

KOMAN Government Solutions, LLC
160 East Main Street
Westboro, MA 01581

# KOMAN Government Solutions, LLC
# SOIL BORING LOG

| | |
|---|---|
| Project: Fort Devens/ Shepley's Hill Landfill | Boring No.: SHP-16-04 |
| Project No.: 1072-003 | Drilling Co.: Cascade |
| Address: Cook Street, Ayer, MA | Driller: J. Graglia |
| Logger: L. Klosterman | Drilling Method: Sonic |
| Dates: 8/5/2016 -8/10/16 | Drilling Equip: 6", 4" Casing, Pushahead |
| Total Boring Depth: 116.0 feet bgs | Static Water: ≈ 15 feet bgs |

| Core Section | Recovery (ft) | Shallow A | Deep B | Soil Profile | GEOLOGIC LOG |
|---|---|---|---|---|---|
| 40-45' | 3.0 | | | | Wet, brown to gray, medium to coarse SAND |
| 45-50' | 5.0 | | | | Wet, brown to gray, medium and coarse SAND |
| 50-55' | 4.5 | | | | Wet, gray, medium to coarse SAND |
| 55-60' | 2.0 | | | | Wet, gray, medium to coarse SAND, some pebbles (1-2") |
| 60-65' | 1.5 | | | | Wet, gray, medium SAND |
| 65-70' | 0.5 | | | | Wet, gray, medium SAND |
| 70-75' | 3.0 | | | | Wet, gray, medium SAND with trace Silt |
| 75-80' | 0.0 | | | | No recovery |

Notes:

Top soil
Primarily Sand
Primarily Silt
Primarily Clay
Till
Shale
Gravel
Heterogeneous Mixture
Bedrock

KOMAN Government Solutions, LLC
160 East Main Street
Westboro, MA 01581

# KOMAN Government Solutions, LLC
# SOIL BORING LOG

| | |
|---|---|
| Project: Fort Devens/ Shepley's Hill Landfill | Boring No.: SHP-16-04 |
| Project No.: 1072-003 | Drilling Co.: Cascade |
| Address: Cook Street, Ayer, MA | Driller: J. Graglia |
| Logger: L. Klosterman | Drilling Method: Sonic |
| Dates: 8/5/2016 -8/10/16 | Drilling Equip: 6", 4" Casing, Pushahead |
| Total Boring Depth: 116.0 feet bgs | Static Water: ≈ 15 feet bgs |

| Core Section | Recovery (ft) | Shallow A | Deep B | Soil Profile | GEOLOGIC LOG |
|---|---|---|---|---|---|
| 80-85' | 1.5 | | | | Wet, gray, medium SAND, well sorted |
| 85-90' | 0.0 | | | | No recovery |
| 90-95' | 4.5 | | | | Wet, gray, fine to medium SAND, well sorted |
| 95-100' | 5.0 | | | | Wet, olive gray, fine to medium SAND |
| 100-105' | 3.0 | | | | Wet, olive gray, medium SAND with some coarse Sand |
| 105-110' | 3.0 | | | | Wet, gray, poorly sorted, SAND and GRAVEL, some fine Silt, cobbles (3-5")<br>Probable TILL |
| 110-115' | 4.0 | | | | 110-112.5': Wet, gray, fine to coarse SAND and some weathered rock.<br>112.5-115': Moist, brown, SAND and Gravel with TILL and weathered rock |
| 115-116' | 1.0 | | | | 115': BEDROCK<br>116': End of Boring |

Notes: Sand | Bentonite | Grout

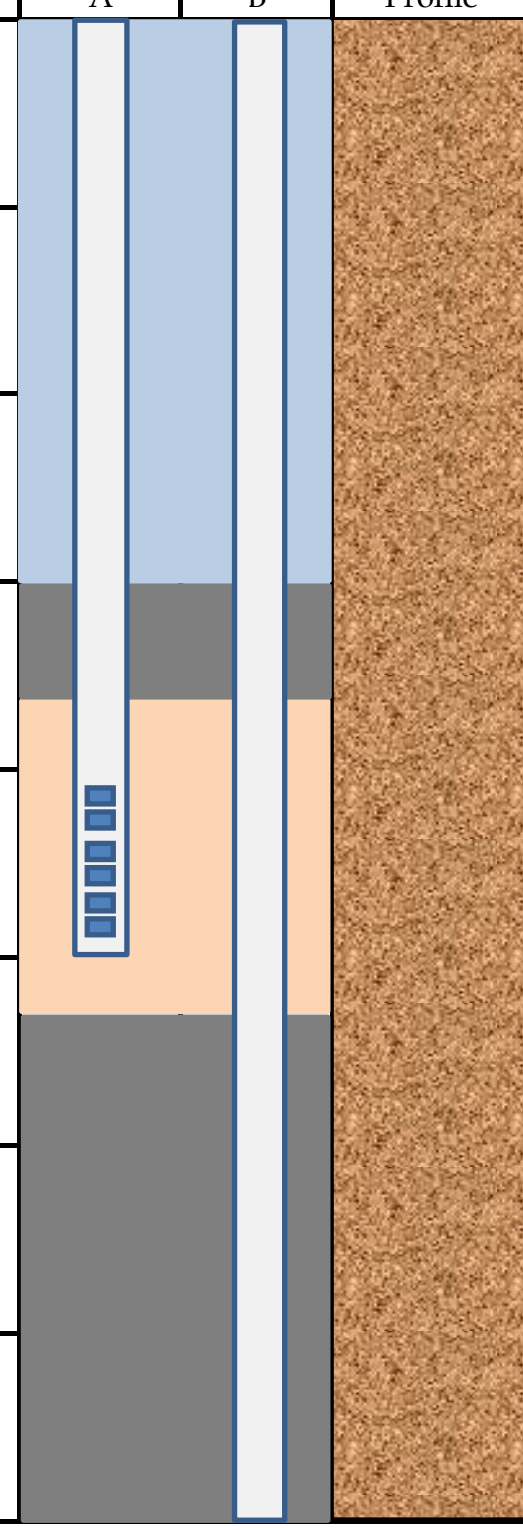
Top soil
Primarily Sand
Primarily Silt
Primarily Clay
Till
Shale
Gravel
Heterogeneous Mixture
Bedrock

KOMAN Government Solutions, LLC
160 East Main Street
Westboro, MA 01581

# KOMAN Government Solutions, LLC
# SOIL BORING LOG

| | |
|---|---|
| Project: Fort Devens/ Shepley's Hill Landfill | Boring No.: SHP-16-05 |
| Project No.: 1072-003 | Drilling Co.: Cascade |
| Address: Cook Street, Ayer, MA | Driller: J. Graglia |
| Logger: L. Klosterman | Drilling Method: Sonic |
| Dates: 8/1/16 to 8/3/16 | Drilling Equip: 6", 4" Casing, Pushahead |
| Total Boring Depth: 122.5 feet bgs | Static Water: ≈ 17 feet bgs |

| Core Section | Recovery (ft) | Shallow A | Deep B | Soil Profile | GEOLOGIC LOG |
|---|---|---|---|---|---|
| 0-10' | 5.8 | | | | 0-5': Dry, brown, medium to fine SAND<br>5-10': Dry, tan, medium SAND with some Pebbles (1-2") |
| 10-15' | 5.0 | | | | 10-13': Dry to Moist, tan, medium SAND<br>13-14': Moist, brown, medium SAND 14-<br>15': Wet, dark brown, medium SAND |
| 15-20' | 3.0 | | | | Wet, dark brown, coarse to medium SAND, some Pebbles (1-3") |
| 20-25' | 4.0 | | | | 20-23': Wet, dark brown, coarse to medium SAND<br>23'-25': Wet, dark brown, medium SAND |
| 25-30' | 0.0 | | | | No recovery |
| 30-35' | 4.0 | | | | Wet, dark brown, coarse to medium SAND, some Pebbles (1-3") |
| 35-45' | 4.5 | | | | Wet, gray, coarse to medium SAND, some Gravel |
| 45-50' | 2.5 | | | | Wet, gray, medium SAND |



Notes:

1. Nested monitoring wells installed with standpipe. Screened 25-30 feet and 85-90 feet below existing ground surface.
2. PID Readings not collected for soil characterization of metals.

Soil Characterization

- Top soil
- Primarily Sand
- Primarily Silt
- Primarily Clay
- Till
- Shale
- Gravel
- Heterogeneous Mixture
- Bedrock

KOMAN Government Solutions, LLC
160 East Main Street
Westboro, MA 01581

**KOMAN Government Solutions, LLC**
**SOIL BORING LOG**

| | |
|---|---|
| Project: Fort Devens/ Shepley's Hill Landfill | Boring No.: SHP-16-05 |
| Project No.: 1072-003 | Drilling Co.: Cascade |
| Address: Cook Street, Ayer, MA | Driller: J. Graglia |
| Logger: L. Klosterman | Drilling Method: Sonic |
| Dates: 8/1/16 to 8/3/16 | Drilling Equip: 6", 4" Casing, Pushahead |
| Total Boring Depth: 122.5 feet bgs | Static Water: ≈ 17 feet bgs |

| Core Section | Recovery (ft) | Shallow A | Deep B | Soil Profile | GEOLOGIC LOG |
|---|---|---|---|---|---|
| 50-55' | 3.0 | | | | 50-53': No recovery<br>53-55': Wet, gray, medium SAND |
| 55-60' | 0.0 | | | | No recovery |
| 60-65' | 4.5 | | | | 60-63': Wet, gray, medium SAND, well sorted<br>63-65': Wet, gray, medium to coarse SAND |
| 65-70' | 0.0 | | | | No recovery |
| 70-75' | 4.0 | | | | Wet, gray, coarse SAND and GRAVEL |
| 75-85' | 4.0 | | | | 75-80': No Recovery<br>80-85': Wet, gray, medium SAND |
| 85-95' | 6.0 | | | | 85-90': Wet, gray, medium to fine SAND<br>90-95': Wet, gray, medium SAND with some coarse Sand |
| 95-105' | 7.5 | | | | 95-100': Wet, gray, fine to medium SAND<br>100-105': Wet, gray, medium SAND |

Notes:

Top soil
Primarily Sand
Primarily Silt
Primarily Clay
Till
Shale
Gravel
Heterogeneous Mixture
Bedrock

KOMAN Government Solutions, LLC
160 East Main Street
Westboro, MA 01581

# KOMAN Government Solutions, LLC
# SOIL BORING LOG

| | |
|---|---|
| Project: Fort Devens/ Shepley's Hill Landfill | Boring No.: SHP-16-05 |
| Project No.: 1072-003 | Drilling Co.: Cascade |
| Address: Cook Street, Ayer, MA | Driller: J. Graglia |
| Logger: L. Klosterman | Drilling Method: Sonic |
| Dates: 8/1/16 to 8/3/16 | Drilling Equip: 6", 4" Casing, Pushahead |
| Total Boring Depth: 122.5 feet bgs | Static Water: ≈ 17 feet bgs |

| Core Section | Recovery (ft) | Shallow A | Deep B | Soil Profile | GEOLOGIC LOG |
|---|---|---|---|---|---|
| 105-115' | 8.5 | | | | 105-110': Wet, olive gray, fine to medium SAND<br>110-115': Wet, olive gray, fine to medium SAND |
| 115-120' | 8.5 | | | | 115-117.5': Wet, brown, medium SAND<br>117.5-119': Wet, light gray, TILL with some weathered Bedrock<br>119-120': Weathered bedrock |
| 120-122.5' | 2.5 | | | | 120-122.5': Wet, gray, TILL and Weathered BEDROCK<br>122.5': Competent BEDROCK<br>122.5': End of Boring |

Notes: Sand | Bentonite | Grout

Top soil
Primarily Sand
Primarily Silt

Primarily Clay
Till
Shale

Gravel
Heterogeneous Mixture
Bedrock

KGS

KOMAN Government Solutions, LLC
160 East Main Street
Westboro, MA 01581

# Attachment 3

## Piezometer Installation Procedures

**Piezometer Installation Procedure**

*Prepared by KOMAN Government Solutions, LLC (KGS)*

Two piezometers were installed immediately upgradient of EW-01 and EW-04 and were not scoped in the USEPA SOW letter. The piezometers were installed for hydraulic monitoring purposes near the two extraction wells. Each 2-inch diameter piezometer was constructed using 5-foot screens located at the corresponding mid screen depths of the extraction well screens.

To ensure the proper installation and completion of the piezometer well to the desired depth the following general procedures were followed:

- All well casing and screen material was assembled and installed with sufficient care to prevent damage to the sections and joints.
- Well casing and screen (2-inch in diameter) were connected by tightly screwing the section components together in order to prevent introduction of contaminants, such as glue or solvents, into the well.
- Prior to installing the section(s) of well screen into the well boring, an end cap was placed at the bottom of the well screen.
- Two feet of #1 sand filter pack was measured and installed below the end cap prior to screen installation and sand pack measured to 2 feet above the screen.
- Three feet of #00 choker sand was measured to 2 feet above the #1 silica sand pack.
- A bentonite seal using CETCO Puregold medium chips was used to prevent communication between the filter sand pack and any natural cave-in material above the screen. A 2 to 3-ft bentonite chip seal was measured and placed from above the filter pack of the well screen to ensure no vertical surface water would enter the screened zone. Bentonite chips or tremie grout was placed above the top of the well screen sand pack up to surface.
- The amount of water added to the cement/bentonite grout mixture was stated in the manufacturer's specifications. The water added to the bentonite for hydration or to mix slurry was from a municipal water source from the Town of Ayer.
- In areas where the borehole did not collapse, such as the dry zone above the water table, grout was used for backfill.
- Care was taken so a completed monitoring well was sufficiently straight to allow passage of transducers, water level equipment or sampling devices.
- Upon completion of well installation, the piezometers were surveyed using a permanent black mark on PVC riser as top of casing. Water gauging measurements were recorded using the permanent black mark to record depth to water and depth to bottom of the well from the PVC measuring reference mark.
- Well surface completion consisted of a 2-ft by 2-ft concrete pad and terminated inside a 6-inch diameter steel stick-up protective casing.
- Well identification using permanent marker or paint was applied to the interior and exterior standpipe at each nested monitoring well location upon completion. Shallow wells were designated with a “A” and deep wells designated with a “B”.

# Attachment 4

## Groundwater Elevations

**Attachment 4: Groundwater Elevations Used for Vertical Gradient Calculations**

| Well ID | Reference Elevation (ft) | 11/2/2017 | | 11/1/2018 | | 5/13/2019 | | 10/22/2019 | | 5/18/2020 | | 11/4/2020 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DTW (ft) | Elevation (ft) | DTW (ft) | Elevation (ft) | DTW (ft) | Elevation (ft) | DTW (ft) | Elevation (ft) | DTW (ft) | Elevation (ft) | DTW (ft) | Elevation (ft) |
| EPA-PZ-2012-1A | 223.79 | 10.62 | 213.17 | 10.69 | 213.10 | 10.07 | 213.72 | 12.15 | 211.64 | 10.38 | 213.41 | 12.27 | 211.52 |
| EPA-PZ-2012-1B | 223.53 | 10.35 | 213.18 | 10.43 | 213.10 | 9.82 | 213.71 | 11.80 | 211.73 | 10.09 | 213.44 | 11.93 | 211.60 |
| EPA-PZ-2012-2A | 223.38 | 9.96 | 213.42 | 10.15 | 213.23 | 9.71 | 213.67 | 11.42 | 211.96 | 9.94 | 213.44 | 11.51 | 211.87 |
| EPA-PZ-2012-2B | 223.37 | 10.11 | 213.26 | 10.29 | 213.08 | 9.77 | 213.60 | 11.44 | 211.93 | 9.98 | 213.39 | 11.51 | 211.86 |
| EPA-PZ-2012-3A | 222.65 | 10.10 | 212.55 | 10.20 | 212.45 | 9.46 | 213.19 | 11.68 | 210.97 | 9.81 | 212.84 | 11.76 | 210.89 |
| EPA-PZ-2012-3B | 222.57 | 10.11 | 212.46 | 10.20 | 212.37 | 9.43 | 213.14 | 11.60 | 210.97 | 9.68 | 212.89 | 11.70 | 210.87 |
| EPA-PZ-2012-4A | 226.60 | 14.35 | 212.25 | 14.36 | 212.24 | 13.46 | 213.14 | 15.92 | 210.68 | 13.94 | 212.66 | 16.00 | 210.60 |
| EPA-PZ-2012-4B | 226.39 | 14.31 | 212.08 | 14.18 | 212.21 | 13.46 | 212.93 | 15.76 | 210.63 | 13.85 | 212.54 | 15.90 | 210.49 |
| EPA-PZ-2012-5A | 220.01 | 7.19 | 212.82 | 7.41 | 212.60 | 6.91 | 213.10 | 8.96 | 211.05 | 7.42 | 212.59 | 9.05 | 210.96 |
| EPA-PZ-2012-5B | 219.38 | 6.70 | 212.68 | 6.83 | 212.55 | 6.26 | 213.12 | 8.24 | 211.14 | 6.72 | 212.66 | 8.32 | 211.06 |
| EPA-PZ-2012-6A | 234.25 | 22.01 | 212.24 | 21.99 | 212.26 | 21.07 | 213.18 | 23.68 | 210.57 | 21.49 | 212.76 | 23.70 | 210.55 |
| EPA-PZ-2012-6B | 234.08 | 21.92 | 212.16 | 21.87 | 212.21 | 21.12 | 212.96 | 23.55 | 210.53 | 21.39 | 212.69 | 23.63 | 210.45 |
| SHP-2016-1A | 227.27 | 14.89 | 212.38 | 14.80 | 212.47 | 13.79 | 213.48 | 16.85 | 210.42 | 14.30 | 212.97 | 16.62 | 210.65 |
| SHP-2016-1B | 227.24 | 16.01 | 211.23 | 16.65 | 210.59 | 15.41 | 211.83 | 17.75 | 209.49 | 16.19 | 211.05 | 18.00 | 209.24 |
| SHP-2016-2A | 225.93 | 13.65 | 212.28 | 13.15 | 212.78 | 12.93 | 213.00 | 15.41 | 210.52 | 13.27 | 212.66 | 15.28 | 210.65 |
| SHP-2016-2B | 225.95 | 13.69 | 212.26 | 13.22 | 212.73 | 13.00 | 212.95 | 16.29 | 209.66 | 13.35 | 212.60 | 15.30 | 210.65 |
| SHP-2016-3A | 223.18 | 10.92 | 212.26 | 11.10 | 212.08 | 10.14 | 213.04 | 12.50 | 210.68 | 10.81 | 212.37 | 11.52 | 211.66 |
| SHP-2016-3B | 223.18 | 10.86 | 212.32 | 10.95 | 212.23 | 10.21 | 212.97 | 12.37 | 210.81 | 10.55 | 212.63 | 12.47 | 210.71 |
| SHP-2016-4A | 229.97 | 17.78 | 212.19 | 17.80 | 212.17 | 16.93 | 213.04 | 24.83 | 205.14 | 17.41 | 212.56 | 19.45 | 210.52 |
| SHP-2016-4B | 229.75 | 17.52 | 212.23 | 17.56 | 212.19 | 16.74 | 213.01 | 19.10 | 210.65 | 17.13 | 212.62 | 19.17 | 210.58 |
| SHP-2016-5A | 227.01 | 14.72 | 212.29 | 14.80 | 212.21 | 13.93 | 213.08 | 16.10 | 210.91 | 14.35 | 212.66 | 16.35 | 210.66 |
| SHP-2016-5B | 226.95 | 14.70 | 212.25 | 14.79 | 212.16 | 13.93 | 213.02 | 16.28 | 210.67 | 14.29 | 212.66 | 16.38 | 210.57 |
| SHM-05-42A | 216.81 | 4.43 | 212.38 | 4.52 | 212.29 | 4.03 | 212.78 | 8.05 | 208.76 | - | - | 5.90 | 210.91 |
| SHM-05-42B | 216.8 | 4.52 | 212.28 | 4.68 | 212.12 | 3.99 | 212.81 | 7.50 | 209.30 | - | - | 6.00 | 210.80 |
| SHM-96-5B | 218.92 | 6.08 | 212.84 | 6.10 | 212.82 | 5.50 | 213.42 | 7.49 | 211.43 | 5.79 | 213.13 | 7.63 | 211.29 |
| SHM-96-5C | 218.39 | 5.49 | 212.90 | 5.58 | 212.81 | - | - | 6.97 | 211.42 | - | - | 7.08 | 211.31 |
| SHP-05-45A | 228.48 | 16.08 | 212.40 | 16.12 | 212.36 | 15.21 | 213.27 | 17.73 | 210.75 | - | - | 17.90 | 210.58 |
| SHP-05-45B | 229.11 | 16.87 | 212.24 | 16.89 | 212.22 | 15.87 | 213.24 | 18.42 | 210.69 | - | - | 18.31 | 210.80 |
| SHP-05-46A | 228.18 | 15.42 | 212.76 | 14.89 | 213.29 | 14.46 | 213.72 | 16.95 | 211.23 | - | - | 17.11 | 211.07 |
| SHP-05-46B | 227.60 | 14.74 | 212.86 | 14.74 | 212.86 | 13.83 | 213.77 | 16.30 | 211.30 | - | - | 16.38 | 211.22 |

**Notes & Abbreviations:**

1. Data sources:

- 11/2/2017: Table 5-4 of the December 2019 Draft Final 2018 Annual Operations, Maintenance, and Monitoring Report, Shepley's Hill Landfill, Former Fort Devens Army Installation by KOMAN Government Solutions, LLC.
- 11/1/2018, 10/22/2019, 5/18/2020, and 11/4/2020: Long Term Monitoring datasets, downloaded from the database at ftdevens.org.
- 5/13/2019: SHL ORD Manual Water Levels_2016-2019.xlsx Microsoft Excel file, transmitted via electronic mail on 9/18/2020 by Carol Keating (United States Environmental Protection Agency) to Robert Simeone (United States Army).

2. Grey highlighted cells indicate depth to water data do not match the rounded value shown in the SHL ORD Manual Water Levels_2016-2019.xlsx file (ORD Data file) because the data for this monitoring well on this date in the ORD Data file includes three decimal places. In instances where this occurs, the groundwater elevation shown in the ORD Data file was used, and the DTW was calculated based on the groundwater elevation and the reference elevation.

3. Data for EPA-PZ-2012-5A and -5B shown for 5/18/2020 were recorded on 5/22/2020. Data for SHP-2016-1B shown for 11/4/2020 were recorded on 11/5/2020. Depth to water data collected during the synoptic gauging event at these locations were not consistent with historical data, so the depth to water measurements collected prior to subsequently sampling these locations is shown above and were used in calculations.

4. Elevations shown are in North American Vertical Datum of 1988 (NAVD 88).

5. DTW = depth to water

6. ft = feet

**Attachment 4: Groundwater Elevations Used in 3PE Vector Gradient Analyses and Potentiometric Maps**

| Well ID | Reference Elevation (ft) | 8/16/2016 | | 10/20/2016 | | 3/2/2017 | | 11/2/2017 | | 5/22/2018 | | 11/1/2018 | | 5/13/2019 | | 10/22/2019 | | 5/18/2020 | | 11/4/2020 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DTW (ft) | Elevation (ft) | DTW (ft) | Elevation (ft) | DTW (ft) | Elevation (ft) | DTW (ft) | Elevation (ft) | DTW (ft) | Elevation (ft) | DTW (ft) | Elevation (ft) | DTW (ft) | Elevation (ft) | DTW (ft) | Elevation (ft) | DTW (ft) | Elevation (ft) | DTW (ft) | Elevation (ft) |
| EPA-PZ-2012-1B | 223.53 | 12.51 | 211.02 | 12.63 | 210.90 | 10.35 | 213.18 | 10.35 | 213.18 | 10.72 | 212.81 | 10.43 | 213.10 | 9.82 | 213.71 | 11.80 | 211.73 | 10.09 | 213.44 | 11.93 | 211.60 |
| EPA-PZ-2012-2B | 223.37 | 12.12 | 211.25 | 12.22 | 211.15 | 10.13 | 213.24 | 10.11 | 213.26 | 10.53 | 212.84 | 10.29 | 213.08 | 9.77 | 213.60 | 11.44 | 211.93 | 9.98 | 213.39 | 11.51 | 211.86 |
| EPA-PZ-2012-3B | 222.57 | 12.27 | 210.30 | 12.37 | 210.20 | 9.97 | 212.60 | 10.11 | 212.46 | 10.36 | 212.21 | 10.20 | 212.37 | 9.43 | 213.14 | 11.60 | 210.97 | 9.68 | 212.89 | 11.70 | 210.87 |
| EPA-PZ-2012-4B | 226.39 | 16.49 | 209.90 | 16.57 | 209.82 | 14.07 | 212.32 | 14.31 | 212.08 | 14.56 | 211.83 | 14.18 | 212.21 | 13.46 | 212.93 | 15.76 | 210.63 | 13.85 | 212.54 | 15.90 | 210.49 |
| EPA-PZ-2012-5B | 219.38 | 8.82 | 210.56 | 8.93 | 210.45 | 6.68 | 212.70 | 6.70 | 212.68 | 7.10 | 212.28 | 6.83 | 212.55 | 6.26 | 213.12 | 8.24 | 211.14 | 6.72 | 212.66 | 8.32 | 211.06 |
| EPA-PZ-2012-6B | 234.08 | 24.14 | 209.94 | 24.25 | 209.83 | 21.75 | 212.33 | 21.92 | 212.16 | 22.17 | 211.92 | 21.87 | 212.21 | 21.12 | 212.96 | 23.55 | 210.53 | 21.39 | 212.69 | 23.63 | 210.45 |
| SHP-2016-1B | 227.24 | 18.04 | 209.20 | 18.46 | 208.78 | 16.08 | 211.16 | 16.01 | 211.23 | 16.59 | 210.65 | 16.65 | 210.59 | 15.41 | 211.83 | 17.75 | 209.49 | 16.19 | 211.05 | 18.00 | 209.24 |
| SHP-2016-2B | 225.95 | - | - | 15.96 | 209.99 | 13.59 | 212.36 | 13.69 | 212.26 | 13.97 | 211.98 | 13.22 | 212.73 | 13.00 | 212.95 | 16.29 | 209.66 | 13.35 | 212.60 | 15.30 | 210.65 |
| SHP-2016-3B | 223.18 | 13.07 | 210.11 | 13.13 | 210.05 | 10.78 | 212.40 | 10.86 | 212.32 | 11.15 | 212.03 | 10.95 | 212.23 | 10.21 | 212.97 | 12.37 | 210.81 | 10.55 | 212.63 | 12.47 | 210.71 |
| SHP-2016-4B | 229.75 | 19.75 | 210.00 | 19.78 | 209.97 | 17.39 | 212.37 | 17.52 | 212.23 | 17.74 | 212.01 | 17.56 | 212.19 | 16.74 | 213.01 | 19.10 | 210.65 | 17.13 | 212.62 | 19.17 | 210.58 |
| SHP-2016-5B | 226.95 | 16.95 | 210.00 | 17.01 | 209.94 | 14.60 | 212.36 | 14.70 | 212.25 | 14.93 | 212.02 | 14.79 | 212.16 | 13.93 | 213.02 | 16.28 | 210.67 | 14.29 | 212.66 | 16.38 | 210.57 |
| SHM-05-42B | 216.80 | 6.59 | 210.21 | 6.68 | 210.12 | 4.44 | 212.36 | 4.52 | 212.28 | 4.84 | 211.96 | 4.68 | 212.12 | 3.99 | 212.81 | 7.50 | 209.30 | - | - | 6.00 | 210.80 |
| SHM-96-5B | 218.92 | 8.17 | 210.75 | 8.26 | 210.66 | 5.99 | 212.93 | 6.08 | 212.84 | 6.38 | 212.54 | 6.10 | 212.82 | 5.50 | 213.42 | 7.49 | 211.43 | 5.79 | 213.13 | 7.63 | 211.29 |
| SHP-05-45B | 229.11 | 18.84 | 210.27 | 19.04 | 210.07 | 16.71 | 212.40 | 16.87 | 212.24 | 16.94 | 212.17 | 16.89 | 212.22 | 15.87 | 213.24 | 18.42 | 210.69 | - | - | 18.31 | 210.80 |
| SHP-05-46B | 227.60 | 16.86 | 210.74 | 17.09 | 210.51 | 14.67 | 212.93 | 14.74 | 212.86 | 14.88 | 212.72 | 14.74 | 212.86 | 13.83 | 213.77 | 16.30 | 211.30 | - | - | 16.38 | 211.22 |
| SHM-10-06A | 248.54 | 36.03 | 212.51 | 36.19 | 212.35 | 34.04 | 214.50 | 34.02 | 214.52 | 34.24 | 214.30 | 33.98 | 214.56 | 33.41 | 215.13 | 35.30 | 213.24 | - | - | 36.11 | 212.43 |
| SHM-10-06 | 232.91 | 20.70 | 212.21 | 20.87 | 212.04 | 18.62 | 214.29 | 18.60 | 214.31 | 18.78 | 214.13 | 18.55 | 214.36 | 17.87 | 215.04 | 20.00 | 212.91 | - | - | 20.31 | 212.60 |
| SHM-10-16 | 219.23 | 9.22 | 210.01 | 9.32 | 209.91 | 7.01 | 212.22 | 7.13 | 212.10 | 7.40 | 211.83 | 7.20 | 212.03 | 6.48 | 212.75 | 8.62 | 210.61 | - | - | 8.63 | 210.60 |
| SHM-05-41C | 222.57 | - | - | - | - | - | - | 10.53 | 212.04 | 10.68 | 211.89 | 10.60 | 211.97 | - | - | 12.15 | 210.42 | 10.31 | 212.26 | 12.12 | 210.45 |
| EPA-PZ-2012-7B | 234.03 | 24.01 | 210.02 | 24.12 | 209.91 | 21.68 | 212.35 | 21.87 | 212.16 | 22.01 | 212.02 | 22.05 | 211.98 | 20.96 | 213.07 | 23.39 | 210.64 | 21.37 | 212.66 | 23.45 | 210.58 |
| SHP-2016-06B | 241.89 | - | - | - | - | - | - | 22.90 | 218.99 | 20.39 | 221.50 | 21.26 | 220.63 | 19.01 | 222.88 | 24.05 | 217.84 | 19.68 | 222.21 | 24.65 | 217.24 |

**Notes & Abbreviations:**

1. Data sources:
   - 11/2/2017: Table 5-4 of the December 2019 Draft Final 2018 Annual Operations, Maintenance, and Monitoring Report, Shepley's Hill Landfill, Former Fort Devens Army Installation by KOMAN Government Solutions, LLC.
   - 8/16/2016, 11/1/2018, 10/22/2019, 5/18/2020, and 11/4/2020: Long Term Monitoring datasets, downloaded from the database at ftdevens.org.
   - 10/20/2016, 3/2/2017, 5/22/2018, and 5/13/2019: SHL ORD Manual Water Levels_2016-2019.xlsx Microsoft Excel file, transmitted via electronic mail on 9/18/2020 by Carol Keating (United States Environmental Protection Agency) to Robert Simeone (United States Army).
2. Grey highlighted cells indicate depth to water data do not match the rounded value shown in the SHL ORD Manual Water Levels_2016-2019.xlsx file (ORD Data file). The data for this monitoring well on this date in the ORD Data file includes three decimal places. In instances where this occurs, the groundwater elevation shown in the ORD Data file was used, and the DTW was calculated based on the groundwater elevation and the reference elevation.
3. Data for EPA-PZ-2012-5B shown for 5/18/2020 were recorded on 5/22/2020. Data for SHP-2016-1B shown for 11/4/2020 were recorded on 11/5/2020. Depth to water data collected during the synoptic gauging event at these locations were not consistent with historical data, so the depth to water measurements collected prior to subsequently sampling these locations is shown above and were used in calculations.
4. Elevations shown are in North American Vertical Datum of 1988 (NAVD 88).
5. DTW = depth to water
6. ft = feet

# Attachment 5

## Laboratory Results

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-101020-1
Client Project/Site: Devens - SHL EPA SOW Phase 1

For:
KOMAN Government Solutions, LLC
293 Boston Post Road
Suite 100
Marlborough, Massachusetts 01752

Attn: Laurie Ekes

*Authorized for release by:*
*9/22/2017 3:51:38 PM*

Jerry Lanier, Project Manager I
(912)354-7858 e.3410
jerry.lanier@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Job ID: 280-101020-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: KOMAN Government Solutions, LLC

## Project: Devens - SHL EPA SOW Phase 1

## Report Number: 280-101020-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 09/09/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.2º C and 1.5º C.

**METALS (ICP) - DISSOLVED**
Samples SB-2017-05-22-24 (280-101020-1), SB-2017-05-32-34 (280-101020-2), SB-2017-02-32-34 (280-101020-3), SB-2017-02-42-44 (280-101020-4), SB-2017-02-52-54 (280-101020-5), SB-2017-02-62-64 (280-101020-6), SB-2017-02-72-74 (280-101020-7), SB-2017-05-42-44 (280-101020-8), SB-2017-05-52-54 (280-101020-9), SB-2017-05-62-64 (280-101020-10) and SB-2017-05-72-74 (280-101020-11) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared and analyzed on 09/14/2017.

Iron failed the recovery criteria low for the MS/MSD of sample SB-2017-02-62-64 (280-101020-6) in batch 280-387766.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples SB-2017-05-22-24 (280-101020-1), SB-2017-05-32-34 (280-101020-2), SB-2017-02-32-34 (280-101020-3), SB-2017-02-42-44 (280-101020-4), SB-2017-02-52-54 (280-101020-5), SB-2017-02-62-64 (280-101020-6), SB-2017-02-72-74 (280-101020-7), SB-2017-05-42-44 (280-101020-8), SB-2017-05-52-54 (280-101020-9), SB-2017-05-62-64 (280-101020-10) and SB-2017-05-72-74 (280-101020-11) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared and analyzed on 09/14/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples SB-2017-05-22-24 (280-101020-1), SB-2017-05-32-34 (280-101020-2), SB-2017-02-32-34 (280-101020-3), SB-2017-02-42-44 (280-101020-4), SB-2017-02-52-54 (280-101020-5), SB-2017-02-62-64 (280-101020-6), SB-2017-02-72-74 (280-101020-7), SB-2017-05-42-44 (280-101020-8), SB-2017-05-52-54 (280-101020-9), SB-2017-05-62-64 (280-101020-10) and SB-2017-05-72-74 (280-101020-11) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 09/11/2017.

Alkalinity was detected in method blank MB 280-387314/31 at a level that was above the method detection limit but below the reporting

## Job ID: 280-101020-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Alkalinity was detected in method blank MB 280-387314/5 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**9056 ANIONS**

Samples SB-2017-05-22-24 (280-101020-1), SB-2017-05-32-34 (280-101020-2), SB-2017-02-32-34 (280-101020-3), SB-2017-02-42-44 (280-101020-4), SB-2017-02-52-54 (280-101020-5), SB-2017-02-62-64 (280-101020-6), SB-2017-02-72-74 (280-101020-7), SB-2017-05-42-44 (280-101020-8), SB-2017-05-52-54 (280-101020-9), SB-2017-05-62-64 (280-101020-10) and SB-2017-05-72-74 (280-101020-11) were analyzed for 9056 Anions in accordance with 9056. The samples were analyzed on 09/11/2017 and 09/12/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**DISSOLVED ORGANIC CARBON**

Samples SB-2017-05-22-24 (280-101020-1), SB-2017-05-32-34 (280-101020-2), SB-2017-02-32-34 (280-101020-3), SB-2017-02-42-44 (280-101020-4), SB-2017-02-52-54 (280-101020-5), SB-2017-02-62-64 (280-101020-6), SB-2017-02-72-74 (280-101020-7), SB-2017-05-42-44 (280-101020-8), SB-2017-05-52-54 (280-101020-9), SB-2017-05-62-64 (280-101020-10) and SB-2017-05-72-74 (280-101020-11) were analyzed for dissolved organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 09/14/2017 and 09/15/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-101020-1 | SB-2017-05-22-24 | Water | 09/07/17 12:45 | 09/09/17 08:50 |
| 280-101020-2 | SB-2017-05-32-34 | Water | 09/07/17 15:35 | 09/09/17 08:50 |
| 280-101020-3 | SB-2017-02-32-34 | Water | 09/07/17 09:30 | 09/09/17 08:50 |
| 280-101020-4 | SB-2017-02-42-44 | Water | 09/07/17 10:55 | 09/09/17 08:50 |
| 280-101020-5 | SB-2017-02-52-54 | Water | 09/07/17 12:15 | 09/09/17 08:50 |
| 280-101020-6 | SB-2017-02-62-64 | Water | 09/07/17 13:35 | 09/09/17 08:50 |
| 280-101020-7 | SB-2017-02-72-74 | Water | 09/07/17 15:30 | 09/09/17 08:50 |
| 280-101020-8 | SB-2017-05-42-44 | Water | 09/08/17 09:25 | 09/09/17 08:50 |
| 280-101020-9 | SB-2017-05-52-54 | Water | 09/08/17 10:50 | 09/09/17 08:50 |
| 280-101020-10 | SB-2017-05-62-64 | Water | 09/08/17 12:35 | 09/09/17 08:50 |
| 280-101020-11 | SB-2017-05-72-74 | Water | 09/08/17 14:10 | 09/09/17 08:50 |

# Method Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 6020A | Metals (ICP/MS) | SW846 | TAL DEN |
| 9056A | Anions, Ion Chromatography | SW846 | TAL DEN |
| 9060 | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Definitions/Glossary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

## Qualifiers

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

## Client Sample ID: SB-2017-05-22-24 — Lab Sample ID: 280-101020-1

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 350 | | 100 | 22 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 210 | | 10 | 0.26 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 1.6 | J | 5.0 | 0.33 | ug/L | 1 | | 6020A | Dissolved |
| Chloride | 22 | | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 2.9 | J | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Alkalinity | 56 | B | 5.0 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 8.2 | | 1.0 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-05-32-34 — Lab Sample ID: 280-101020-2

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 1700 | | 100 | 22 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 95 | | 10 | 0.26 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 3.8 | J | 5.0 | 0.33 | ug/L | 1 | | 6020A | Dissolved |
| Chloride | 2.0 | J | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 2.5 | J | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Alkalinity | 20 | B | 5.0 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.4 | | 1.0 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-02-32-34 — Lab Sample ID: 280-101020-3

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 61 | J | 100 | 22 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 51 | | 10 | 0.26 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 0.87 | J | 5.0 | 0.33 | ug/L | 1 | | 6020A | Dissolved |
| Chloride | 3.6 | | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 4.0 | J | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Alkalinity | 21 | B | 5.0 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.1 | | 1.0 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-02-42-44 — Lab Sample ID: 280-101020-4

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 1400 | | 100 | 22 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 110 | | 10 | 0.26 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 0.77 | J | 5.0 | 0.33 | ug/L | 1 | | 6020A | Dissolved |
| Chloride | 6.7 | | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 9.0 | | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Alkalinity | 35 | B | 5.0 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.8 | | 1.0 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-02-52-54 — Lab Sample ID: 280-101020-5

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 7100 | | 100 | 22 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 690 | | 10 | 0.26 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 6.3 | | 5.0 | 0.33 | ug/L | 1 | | 6020A | Dissolved |
| Chloride | 47 | | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 4.8 | J | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Alkalinity | 56 | B | 5.0 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

## Client Sample ID: SB-2017-02-52-54 (Continued) — Lab Sample ID: 280-101020-5

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.2 | | 1.0 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-02-62-64 — Lab Sample ID: 280-101020-6

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 14000 | J | 100 | 22 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 640 | J | 10 | 0.26 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 11 | | 5.0 | 0.33 | ug/L | 1 | | 6020A | Dissolved |
| Chloride | 28 | | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 1.7 | J | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Alkalinity | 69 | B | 5.0 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 3.6 | | 1.0 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-02-72-74 — Lab Sample ID: 280-101020-7

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 16000 | | 100 | 22 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 830 | | 10 | 0.26 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 19 | | 5.0 | 0.33 | ug/L | 1 | | 6020A | Dissolved |
| Chloride | 5.8 | | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 6.8 | M | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Alkalinity | 78 | B | 5.0 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.4 | | 1.0 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-05-42-44 — Lab Sample ID: 280-101020-8

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 4100 | | 100 | 22 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 400 | | 10 | 0.26 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 1.1 | J | 5.0 | 0.33 | ug/L | 1 | | 6020A | Dissolved |
| Chloride | 31 | | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 3.4 | J | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Alkalinity | 49 | B | 5.0 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.1 | | 1.0 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-05-52-54 — Lab Sample ID: 280-101020-9

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 6600 | | 100 | 22 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 380 | | 10 | 0.26 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 9.7 | | 5.0 | 0.33 | ug/L | 1 | | 6020A | Dissolved |
| Chloride | 15 | | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 5.6 | | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Alkalinity | 45 | B | 5.0 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.9 | | 1.0 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-05-62-64 — Lab Sample ID: 280-101020-10

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 11000 | | 100 | 22 | ug/L | 1 | | 6010C | Dissolved |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

## Client Sample ID: SB-2017-05-62-64 (Continued) — Lab Sample ID: 280-101020-10

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Manganese | 300 | | 10 | 0.26 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 25 | | 5.0 | 0.33 | ug/L | 1 | | 6020A | Dissolved |
| Chloride | 2.0 | J | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 4.5 | J | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Alkalinity | 51 | B | 5.0 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.2 | | 1.0 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-05-72-74 — Lab Sample ID: 280-101020-11

| Analyte | Result | Qualifier | LOQ | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 30000 | | 100 | 22 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 1400 | | 10 | 0.26 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 82 | | 5.0 | 0.33 | ug/L | 1 | | 6020A | Dissolved |
| Chloride | 4.9 | | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 5.1 | M | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Alkalinity | 100 | B | 5.0 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.5 | | 1.0 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

This Detection Summary does not include radiochemical test results.

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

## Method: 6010C - Metals (ICP) - Dissolved

**Client Sample ID: SB-2017-05-22-24** — **Lab Sample ID: 280-101020-1**
**Date Collected: 09/07/17 12:45** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 350 | | 100 | 22 | ug/L | | 09/14/17 07:36 | 09/14/17 22:44 | 1 |
| Manganese | 210 | | 10 | 0.26 | ug/L | | 09/14/17 07:36 | 09/14/17 22:44 | 1 |

**Client Sample ID: SB-2017-05-32-34** — **Lab Sample ID: 280-101020-2**
**Date Collected: 09/07/17 15:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 1700 | | 100 | 22 | ug/L | | 09/14/17 07:36 | 09/14/17 22:47 | 1 |
| Manganese | 95 | | 10 | 0.26 | ug/L | | 09/14/17 07:36 | 09/14/17 22:47 | 1 |

**Client Sample ID: SB-2017-02-32-34** — **Lab Sample ID: 280-101020-3**
**Date Collected: 09/07/17 09:30** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 61 | J | 100 | 22 | ug/L | | 09/14/17 07:36 | 09/14/17 23:00 | 1 |
| Manganese | 51 | | 10 | 0.26 | ug/L | | 09/14/17 07:36 | 09/14/17 23:00 | 1 |

**Client Sample ID: SB-2017-02-42-44** — **Lab Sample ID: 280-101020-4**
**Date Collected: 09/07/17 10:55** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 1400 | | 100 | 22 | ug/L | | 09/14/17 07:36 | 09/14/17 23:03 | 1 |
| Manganese | 110 | | 10 | 0.26 | ug/L | | 09/14/17 07:36 | 09/14/17 23:03 | 1 |

**Client Sample ID: SB-2017-02-52-54** — **Lab Sample ID: 280-101020-5**
**Date Collected: 09/07/17 12:15** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 7100 | | 100 | 22 | ug/L | | 09/14/17 07:36 | 09/14/17 23:05 | 1 |
| Manganese | 690 | | 10 | 0.26 | ug/L | | 09/14/17 07:36 | 09/14/17 23:05 | 1 |

**Client Sample ID: SB-2017-02-62-64** — **Lab Sample ID: 280-101020-6**
**Date Collected: 09/07/17 13:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 14000 | J | 100 | 22 | ug/L | | 09/14/17 07:36 | 09/14/17 22:32 | 1 |
| Manganese | 640 | J | 10 | 0.26 | ug/L | | 09/14/17 07:36 | 09/14/17 22:32 | 1 |

**Client Sample ID: SB-2017-02-72-74** — **Lab Sample ID: 280-101020-7**
**Date Collected: 09/07/17 15:30** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 16000 | | 100 | 22 | ug/L | | 09/14/17 07:36 | 09/14/17 23:08 | 1 |
| Manganese | 830 | | 10 | 0.26 | ug/L | | 09/14/17 07:36 | 09/14/17 23:08 | 1 |

**Client Sample ID: SB-2017-05-42-44** — **Lab Sample ID: 280-101020-8**
**Date Collected: 09/08/17 09:25** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 4100 | | 100 | 22 | ug/L | | 09/14/17 07:36 | 09/14/17 23:10 | 1 |
| Manganese | 400 | | 10 | 0.26 | ug/L | | 09/14/17 07:36 | 09/14/17 23:10 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

**Client Sample ID: SB-2017-05-52-54** — **Lab Sample ID: 280-101020-9**
**Date Collected: 09/08/17 10:50** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 6600 | | 100 | 22 | ug/L | | 09/14/17 07:36 | 09/14/17 23:13 | 1 |
| Manganese | 380 | | 10 | 0.26 | ug/L | | 09/14/17 07:36 | 09/14/17 23:13 | 1 |

**Client Sample ID: SB-2017-05-62-64** — **Lab Sample ID: 280-101020-10**
**Date Collected: 09/08/17 12:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 11000 | | 100 | 22 | ug/L | | 09/14/17 07:36 | 09/14/17 23:16 | 1 |
| Manganese | 300 | | 10 | 0.26 | ug/L | | 09/14/17 07:36 | 09/14/17 23:16 | 1 |

**Client Sample ID: SB-2017-05-72-74** — **Lab Sample ID: 280-101020-11**
**Date Collected: 09/08/17 14:10** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 30000 | | 100 | 22 | ug/L | | 09/14/17 07:36 | 09/14/17 23:18 | 1 |
| Manganese | 1400 | | 10 | 0.26 | ug/L | | 09/14/17 07:36 | 09/14/17 23:18 | 1 |

## Method: 6020A - Metals (ICP/MS) - Dissolved

**Client Sample ID: SB-2017-05-22-24** — **Lab Sample ID: 280-101020-1**
**Date Collected: 09/07/17 12:45** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.6 | J | 5.0 | 0.33 | ug/L | | 09/14/17 07:36 | 09/14/17 21:42 | 1 |

**Client Sample ID: SB-2017-05-32-34** — **Lab Sample ID: 280-101020-2**
**Date Collected: 09/07/17 15:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.8 | J | 5.0 | 0.33 | ug/L | | 09/14/17 07:36 | 09/14/17 21:46 | 1 |

**Client Sample ID: SB-2017-02-32-34** — **Lab Sample ID: 280-101020-3**
**Date Collected: 09/07/17 09:30** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 0.87 | J | 5.0 | 0.33 | ug/L | | 09/14/17 07:36 | 09/14/17 21:49 | 1 |

**Client Sample ID: SB-2017-02-42-44** — **Lab Sample ID: 280-101020-4**
**Date Collected: 09/07/17 10:55** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 0.77 | J | 5.0 | 0.33 | ug/L | | 09/14/17 07:36 | 09/14/17 21:53 | 1 |

**Client Sample ID: SB-2017-02-52-54** — **Lab Sample ID: 280-101020-5**
**Date Collected: 09/07/17 12:15** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 6.3 | | 5.0 | 0.33 | ug/L | | 09/14/17 07:36 | 09/14/17 21:57 | 1 |

## Method: 6020A - Metals (ICP/MS) - Dissolved

**Client Sample ID: SB-2017-02-62-64** — **Lab Sample ID: 280-101020-6**
**Date Collected: 09/07/17 13:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 11 | | 5.0 | 0.33 | ug/L | | 09/14/17 07:36 | 09/14/17 22:12 | 1 |

**Client Sample ID: SB-2017-02-72-74** — **Lab Sample ID: 280-101020-7**
**Date Collected: 09/07/17 15:30** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 19 | | 5.0 | 0.33 | ug/L | | 09/14/17 07:36 | 09/14/17 22:31 | 1 |

**Client Sample ID: SB-2017-05-42-44** — **Lab Sample ID: 280-101020-8**
**Date Collected: 09/08/17 09:25** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.1 | J | 5.0 | 0.33 | ug/L | | 09/14/17 07:36 | 09/14/17 22:35 | 1 |

**Client Sample ID: SB-2017-05-52-54** — **Lab Sample ID: 280-101020-9**
**Date Collected: 09/08/17 10:50** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 9.7 | | 5.0 | 0.33 | ug/L | | 09/14/17 07:36 | 09/14/17 22:39 | 1 |

**Client Sample ID: SB-2017-05-62-64** — **Lab Sample ID: 280-101020-10**
**Date Collected: 09/08/17 12:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 25 | | 5.0 | 0.33 | ug/L | | 09/14/17 07:36 | 09/14/17 22:42 | 1 |

**Client Sample ID: SB-2017-05-72-74** — **Lab Sample ID: 280-101020-11**
**Date Collected: 09/08/17 14:10** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 82 | | 5.0 | 0.33 | ug/L | | 09/14/17 07:36 | 09/14/17 22:46 | 1 |

## General Chemistry

**Client Sample ID: SB-2017-05-22-24** — **Lab Sample ID: 280-101020-1**
**Date Collected: 09/07/17 12:45** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 22 | | 3.0 | 0.25 | mg/L | | | 09/11/17 20:10 | 1 |
| Sulfate | 2.9 | J | 5.0 | 0.23 | mg/L | | | 09/11/17 20:10 | 1 |
| Alkalinity | 56 | B | 5.0 | 1.1 | mg/L | | | 09/11/17 17:20 | 1 |

**Client Sample ID: SB-2017-05-32-34** — **Lab Sample ID: 280-101020-2**
**Date Collected: 09/07/17 15:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.0 | J | 3.0 | 0.25 | mg/L | | | 09/11/17 20:28 | 1 |
| Sulfate | 2.5 | J | 5.0 | 0.23 | mg/L | | | 09/11/17 20:28 | 1 |
| Alkalinity | 20 | B | 5.0 | 1.1 | mg/L | | | 09/11/17 17:15 | 1 |

## General Chemistry

**Client Sample ID: SB-2017-02-32-34** — **Lab Sample ID: 280-101020-3**
**Date Collected: 09/07/17 09:30** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 3.6 | | 3.0 | 0.25 | mg/L | | | 09/11/17 21:21 | 1 |
| Sulfate | 4.0 | J | 5.0 | 0.23 | mg/L | | | 09/11/17 21:21 | 1 |
| Alkalinity | 21 | B | 5.0 | 1.1 | mg/L | | | 09/11/17 17:10 | 1 |

**Client Sample ID: SB-2017-02-42-44** — **Lab Sample ID: 280-101020-4**
**Date Collected: 09/07/17 10:55** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.7 | | 3.0 | 0.25 | mg/L | | | 09/11/17 21:38 | 1 |
| Sulfate | 9.0 | | 5.0 | 0.23 | mg/L | | | 09/11/17 21:38 | 1 |
| Alkalinity | 35 | B | 5.0 | 1.1 | mg/L | | | 09/11/17 13:33 | 1 |

**Client Sample ID: SB-2017-02-52-54** — **Lab Sample ID: 280-101020-5**
**Date Collected: 09/07/17 12:15** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 47 | | 3.0 | 0.25 | mg/L | | | 09/11/17 21:56 | 1 |
| Sulfate | 4.8 | J | 5.0 | 0.23 | mg/L | | | 09/11/17 21:56 | 1 |
| Alkalinity | 56 | B | 5.0 | 1.1 | mg/L | | | 09/11/17 13:43 | 1 |

**Client Sample ID: SB-2017-02-62-64** — **Lab Sample ID: 280-101020-6**
**Date Collected: 09/07/17 13:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 28 | | 3.0 | 0.25 | mg/L | | | 09/11/17 22:14 | 1 |
| Sulfate | 1.7 | J | 5.0 | 0.23 | mg/L | | | 09/11/17 22:14 | 1 |
| Alkalinity | 69 | B | 5.0 | 1.1 | mg/L | | | 09/11/17 14:02 | 1 |

**Client Sample ID: SB-2017-02-72-74** — **Lab Sample ID: 280-101020-7**
**Date Collected: 09/07/17 15:30** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.8 | | 3.0 | 0.25 | mg/L | | | 09/11/17 23:25 | 1 |
| Sulfate | 6.8 | M | 5.0 | 0.23 | mg/L | | | 09/11/17 23:25 | 1 |
| Alkalinity | 78 | B | 5.0 | 1.1 | mg/L | | | 09/11/17 13:48 | 1 |

**Client Sample ID: SB-2017-05-42-44** — **Lab Sample ID: 280-101020-8**
**Date Collected: 09/08/17 09:25** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 31 | | 3.0 | 0.25 | mg/L | | | 09/11/17 23:42 | 1 |
| Sulfate | 3.4 | J | 5.0 | 0.23 | mg/L | | | 09/11/17 23:42 | 1 |
| Alkalinity | 49 | B | 5.0 | 1.1 | mg/L | | | 09/11/17 13:53 | 1 |

**Client Sample ID: SB-2017-05-52-54** — **Lab Sample ID: 280-101020-9**
**Date Collected: 09/08/17 10:50** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 15 | | 3.0 | 0.25 | mg/L | | | 09/12/17 00:00 | 1 |
| Sulfate | 5.6 | | 5.0 | 0.23 | mg/L | | | 09/12/17 00:00 | 1 |
| Alkalinity | 45 | B | 5.0 | 1.1 | mg/L | | | 09/11/17 14:07 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

**Client Sample ID: SB-2017-05-62-64** — **Lab Sample ID: 280-101020-10**
**Date Collected: 09/08/17 12:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.0 | J | 3.0 | 0.25 | mg/L | | | 09/12/17 00:53 | 1 |
| Sulfate | 4.5 | J | 5.0 | 0.23 | mg/L | | | 09/12/17 00:53 | 1 |
| Alkalinity | 51 | B | 5.0 | 1.1 | mg/L | | | 09/11/17 14:12 | 1 |

**Client Sample ID: SB-2017-05-72-74** — **Lab Sample ID: 280-101020-11**
**Date Collected: 09/08/17 14:10** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.9 | | 3.0 | 0.25 | mg/L | | | 09/12/17 01:11 | 1 |
| Sulfate | 5.1 | M | 5.0 | 0.23 | mg/L | | | 09/12/17 01:11 | 1 |
| Alkalinity | 100 | B | 5.0 | 1.1 | mg/L | | | 09/11/17 13:57 | 1 |

## General Chemistry - Dissolved

**Client Sample ID: SB-2017-05-22-24** — **Lab Sample ID: 280-101020-1**
**Date Collected: 09/07/17 12:45** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 8.2 | | 1.0 | 0.16 | mg/L | | | 09/14/17 19:25 | 1 |

**Client Sample ID: SB-2017-05-32-34** — **Lab Sample ID: 280-101020-2**
**Date Collected: 09/07/17 15:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.4 | | 1.0 | 0.16 | mg/L | | | 09/14/17 19:40 | 1 |

**Client Sample ID: SB-2017-02-32-34** — **Lab Sample ID: 280-101020-3**
**Date Collected: 09/07/17 09:30** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.1 | | 1.0 | 0.16 | mg/L | | | 09/14/17 21:15 | 1 |

**Client Sample ID: SB-2017-02-42-44** — **Lab Sample ID: 280-101020-4**
**Date Collected: 09/07/17 10:55** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.8 | | 1.0 | 0.16 | mg/L | | | 09/14/17 21:32 | 1 |

**Client Sample ID: SB-2017-02-52-54** — **Lab Sample ID: 280-101020-5**
**Date Collected: 09/07/17 12:15** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.2 | | 1.0 | 0.16 | mg/L | | | 09/14/17 21:49 | 1 |

## General Chemistry - Dissolved

**Client Sample ID: SB-2017-02-62-64** — **Lab Sample ID: 280-101020-6**
**Date Collected: 09/07/17 13:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.6 | | 1.0 | 0.16 | mg/L | | | 09/14/17 22:05 | 1 |

**Client Sample ID: SB-2017-02-72-74** — **Lab Sample ID: 280-101020-7**
**Date Collected: 09/07/17 15:30** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.4 | | 1.0 | 0.16 | mg/L | | | 09/14/17 22:52 | 1 |

**Client Sample ID: SB-2017-05-42-44** — **Lab Sample ID: 280-101020-8**
**Date Collected: 09/08/17 09:25** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.1 | | 1.0 | 0.16 | mg/L | | | 09/14/17 23:09 | 1 |

**Client Sample ID: SB-2017-05-52-54** — **Lab Sample ID: 280-101020-9**
**Date Collected: 09/08/17 10:50** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.9 | | 1.0 | 0.16 | mg/L | | | 09/14/17 23:26 | 1 |

**Client Sample ID: SB-2017-05-62-64** — **Lab Sample ID: 280-101020-10**
**Date Collected: 09/08/17 12:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.2 | | 1.0 | 0.16 | mg/L | | | 09/14/17 23:44 | 1 |

**Client Sample ID: SB-2017-05-72-74** — **Lab Sample ID: 280-101020-11**
**Date Collected: 09/08/17 14:10** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.5 | | 1.0 | 0.16 | mg/L | | | 09/15/17 00:33 | 1 |

# QC Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-387482/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 387766** — **Prep Batch: 387482**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 85 | U | 100 | 22 | ug/L | | 09/14/17 07:36 | 09/14/17 22:27 | 1 |
| Manganese | 1.0 | U | 10 | 0.26 | ug/L | | 09/14/17 07:36 | 09/14/17 22:27 | 1 |

**Lab Sample ID: LCS 280-387482/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 387766** — **Prep Batch: 387482**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 1000 | 963 | | ug/L | | 96 | 87 - 115 |
| Manganese | 500 | 498 | | ug/L | | 100 | 90 - 114 |

**Lab Sample ID: 280-101020-6 MS** — **Client Sample ID: SB-2017-02-62-64**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387766** — **Prep Batch: 387482**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 14000 | J | 1000 | 13900 | 4 | ug/L | | 12 | 87 - 115 |
| Manganese | 640 | J | 500 | 1090 | | ug/L | | 91 | 90 - 114 |

**Lab Sample ID: 280-101020-6 MSD** — **Client Sample ID: SB-2017-02-62-64**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387766** — **Prep Batch: 387482**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 14000 | J | 1000 | 14200 | 4 | ug/L | | 44 | 87 - 115 | 2 | 20 |
| Manganese | 640 | J | 500 | 1120 | | ug/L | | 97 | 90 - 114 | 3 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 280-387483/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 387740** — **Prep Batch: 387483**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.0 | U | 5.0 | 0.33 | ug/L | | 09/14/17 07:36 | 09/14/17 21:34 | 1 |

**Lab Sample ID: LCS 280-387483/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 387740** — **Prep Batch: 387483**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 40.0 | 41.4 | | ug/L | | 103 | 84 - 116 |

**Lab Sample ID: 280-101020-6 MS** — **Client Sample ID: SB-2017-02-62-64**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387740** — **Prep Batch: 387483**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 11 | | 40.0 | 55.2 | | ug/L | | 110 | 84 - 116 |

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: 280-101020-6 MSD** — **Client Sample ID: SB-2017-02-62-64**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387740** — **Prep Batch: 387483**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 11 | | 40.0 | 53.8 | | ug/L | | 106 | 84 - 116 | 3 | 20 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-387205/6** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387205**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 3.0 | 0.25 | mg/L | | | 09/11/17 15:40 | 1 |
| Sulfate | 0.50 | U | 5.0 | 0.23 | mg/L | | | 09/11/17 15:40 | 1 |

**Lab Sample ID: LCS 280-387205/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387205**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 100 | 102 | | mg/L | | 102 | 87 - 111 |
| Sulfate | 100 | 101 | | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: LCSD 280-387205/5** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387205**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 100 | 102 | | mg/L | | 102 | 87 - 111 | 0 | 10 |
| Sulfate | 100 | 101 | | mg/L | | 101 | 87 - 112 | 0 | 10 |

**Lab Sample ID: MRL 280-387205/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387205**

| Analyte | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 2.50 | 2.51 | J | mg/L | | 100 | 50 - 150 |
| Sulfate | 2.50 | 2.51 | J | mg/L | | 101 | 50 - 150 |

**Lab Sample ID: 280-101020-6 MS** — **Client Sample ID: SB-2017-02-62-64**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387205**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 28 | | 25.0 | 55.3 | | mg/L | | 107 | 87 - 111 |
| Sulfate | 1.7 | J | 25.0 | 28.4 | | mg/L | | 107 | 87 - 112 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: 280-101020-6 MSD** — **Client Sample ID: SB-2017-02-62-64**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387205**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 28 | | 25.0 | 55.6 | | mg/L | | 108 | 87 - 111 | 1 | 10 |
| Sulfate | 1.7 | J | 25.0 | 28.5 | | mg/L | | 107 | 87 - 112 | 1 | 10 |

**Lab Sample ID: 280-101020-6 DU** — **Client Sample ID: SB-2017-02-62-64**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387205**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 28 | | | 28.5 | | mg/L | | | | 0.09 | 10 |
| Sulfate | 1.7 | J | | 1.73 | J | mg/L | | | | 0.9 | 10 |

## Method: 9060 - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-387948/37** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387948**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.16 | mg/L | | | 09/14/17 20:14 | 1 |

**Lab Sample ID: MB 280-387948/4** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387948**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.16 | mg/L | | | 09/14/17 11:17 | 1 |

**Lab Sample ID: LCS 280-387948/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387948**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | | | 25.0 | 26.0 | | mg/L | | 104 | 88 - 112 | | |

**Lab Sample ID: LCS 280-387948/36** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387948**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | | | 25.0 | 25.3 | | mg/L | | 101 | 88 - 112 | | |

**Lab Sample ID: 280-101020-6 MS** — **Client Sample ID: SB-2017-02-62-64**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387948**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.6 | | 25.0 | 29.3 | | mg/L | | 103 | 88 - 112 | | |

# QC Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

**Lab Sample ID: 280-101020-6 MSD** — **Client Sample ID: SB-2017-02-62-64**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387948**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.6 | | 25.0 | 29.4 | | mg/L | | 103 | 88 - 112 | 0 | 15 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-387314/31** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387314**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 2.63 | J | 5.0 | 1.1 | mg/L | | | 09/11/17 15:48 | 1 |

**Lab Sample ID: MB 280-387314/5** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387314**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.40 | J | 5.0 | 1.1 | mg/L | | | 09/11/17 13:28 | 1 |

**Lab Sample ID: LCS 280-387314/30** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387314**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 193 | | mg/L | | 96 | 90 - 110 | | |

**Lab Sample ID: LCS 280-387314/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387314**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 202 | | mg/L | | 101 | 90 - 110 | | |

**Lab Sample ID: 280-101020-4 DU** — **Client Sample ID: SB-2017-02-42-44**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387314**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 35 | B | | 35.2 | | mg/L | | | | 0.8 | 10 |

# QC Association Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

## Metals

### Prep Batch: 387482

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-101020-1 | SB-2017-05-22-24 | Dissolved | Water | 3005A | |
| 280-101020-2 | SB-2017-05-32-34 | Dissolved | Water | 3005A | |
| 280-101020-3 | SB-2017-02-32-34 | Dissolved | Water | 3005A | |
| 280-101020-4 | SB-2017-02-42-44 | Dissolved | Water | 3005A | |
| 280-101020-5 | SB-2017-02-52-54 | Dissolved | Water | 3005A | |
| 280-101020-6 | SB-2017-02-62-64 | Dissolved | Water | 3005A | |
| 280-101020-7 | SB-2017-02-72-74 | Dissolved | Water | 3005A | |
| 280-101020-8 | SB-2017-05-42-44 | Dissolved | Water | 3005A | |
| 280-101020-9 | SB-2017-05-52-54 | Dissolved | Water | 3005A | |
| 280-101020-10 | SB-2017-05-62-64 | Dissolved | Water | 3005A | |
| 280-101020-11 | SB-2017-05-72-74 | Dissolved | Water | 3005A | |
| MB 280-387482/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 280-387482/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 280-101020-6 MS | SB-2017-02-62-64 | Dissolved | Water | 3005A | |
| 280-101020-6 MSD | SB-2017-02-62-64 | Dissolved | Water | 3005A | |

### Prep Batch: 387483

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-101020-1 | SB-2017-05-22-24 | Dissolved | Water | 3005A | |
| 280-101020-2 | SB-2017-05-32-34 | Dissolved | Water | 3005A | |
| 280-101020-3 | SB-2017-02-32-34 | Dissolved | Water | 3005A | |
| 280-101020-4 | SB-2017-02-42-44 | Dissolved | Water | 3005A | |
| 280-101020-5 | SB-2017-02-52-54 | Dissolved | Water | 3005A | |
| 280-101020-6 | SB-2017-02-62-64 | Dissolved | Water | 3005A | |
| 280-101020-7 | SB-2017-02-72-74 | Dissolved | Water | 3005A | |
| 280-101020-8 | SB-2017-05-42-44 | Dissolved | Water | 3005A | |
| 280-101020-9 | SB-2017-05-52-54 | Dissolved | Water | 3005A | |
| 280-101020-10 | SB-2017-05-62-64 | Dissolved | Water | 3005A | |
| 280-101020-11 | SB-2017-05-72-74 | Dissolved | Water | 3005A | |
| MB 280-387483/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 280-387483/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 280-101020-6 MS | SB-2017-02-62-64 | Dissolved | Water | 3005A | |
| 280-101020-6 MSD | SB-2017-02-62-64 | Dissolved | Water | 3005A | |

### Analysis Batch: 387740

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-101020-1 | SB-2017-05-22-24 | Dissolved | Water | 6020A | 387483 |
| 280-101020-2 | SB-2017-05-32-34 | Dissolved | Water | 6020A | 387483 |
| 280-101020-3 | SB-2017-02-32-34 | Dissolved | Water | 6020A | 387483 |
| 280-101020-4 | SB-2017-02-42-44 | Dissolved | Water | 6020A | 387483 |
| 280-101020-5 | SB-2017-02-52-54 | Dissolved | Water | 6020A | 387483 |
| 280-101020-6 | SB-2017-02-62-64 | Dissolved | Water | 6020A | 387483 |
| 280-101020-7 | SB-2017-02-72-74 | Dissolved | Water | 6020A | 387483 |
| 280-101020-8 | SB-2017-05-42-44 | Dissolved | Water | 6020A | 387483 |
| 280-101020-9 | SB-2017-05-52-54 | Dissolved | Water | 6020A | 387483 |
| 280-101020-10 | SB-2017-05-62-64 | Dissolved | Water | 6020A | 387483 |
| 280-101020-11 | SB-2017-05-72-74 | Dissolved | Water | 6020A | 387483 |
| MB 280-387483/1-A | Method Blank | Total Recoverable | Water | 6020A | 387483 |
| LCS 280-387483/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 387483 |
| 280-101020-6 MS | SB-2017-02-62-64 | Dissolved | Water | 6020A | 387483 |
| 280-101020-6 MSD | SB-2017-02-62-64 | Dissolved | Water | 6020A | 387483 |

# QC Association Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

### Analysis Batch: 387766

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-101020-1 | SB-2017-05-22-24 | Dissolved | Water | 6010C | 387482 |
| 280-101020-2 | SB-2017-05-32-34 | Dissolved | Water | 6010C | 387482 |
| 280-101020-3 | SB-2017-02-32-34 | Dissolved | Water | 6010C | 387482 |
| 280-101020-4 | SB-2017-02-42-44 | Dissolved | Water | 6010C | 387482 |
| 280-101020-5 | SB-2017-02-52-54 | Dissolved | Water | 6010C | 387482 |
| 280-101020-6 | SB-2017-02-62-64 | Dissolved | Water | 6010C | 387482 |
| 280-101020-7 | SB-2017-02-72-74 | Dissolved | Water | 6010C | 387482 |
| 280-101020-8 | SB-2017-05-42-44 | Dissolved | Water | 6010C | 387482 |
| 280-101020-9 | SB-2017-05-52-54 | Dissolved | Water | 6010C | 387482 |
| 280-101020-10 | SB-2017-05-62-64 | Dissolved | Water | 6010C | 387482 |
| 280-101020-11 | SB-2017-05-72-74 | Dissolved | Water | 6010C | 387482 |
| MB 280-387482/1-A | Method Blank | Total Recoverable | Water | 6010C | 387482 |
| LCS 280-387482/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 387482 |
| 280-101020-6 MS | SB-2017-02-62-64 | Dissolved | Water | 6010C | 387482 |
| 280-101020-6 MSD | SB-2017-02-62-64 | Dissolved | Water | 6010C | 387482 |

## General Chemistry

### Analysis Batch: 387205

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-101020-1 | SB-2017-05-22-24 | Total/NA | Water | 9056A | |
| 280-101020-2 | SB-2017-05-32-34 | Total/NA | Water | 9056A | |
| 280-101020-3 | SB-2017-02-32-34 | Total/NA | Water | 9056A | |
| 280-101020-4 | SB-2017-02-42-44 | Total/NA | Water | 9056A | |
| 280-101020-5 | SB-2017-02-52-54 | Total/NA | Water | 9056A | |
| 280-101020-6 | SB-2017-02-62-64 | Total/NA | Water | 9056A | |
| 280-101020-7 | SB-2017-02-72-74 | Total/NA | Water | 9056A | |
| 280-101020-8 | SB-2017-05-42-44 | Total/NA | Water | 9056A | |
| 280-101020-9 | SB-2017-05-52-54 | Total/NA | Water | 9056A | |
| 280-101020-10 | SB-2017-05-62-64 | Total/NA | Water | 9056A | |
| 280-101020-11 | SB-2017-05-72-74 | Total/NA | Water | 9056A | |
| MB 280-387205/6 | Method Blank | Total/NA | Water | 9056A | |
| LCS 280-387205/4 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 280-387205/5 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| MRL 280-387205/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| 280-101020-6 MS | SB-2017-02-62-64 | Total/NA | Water | 9056A | |
| 280-101020-6 MSD | SB-2017-02-62-64 | Total/NA | Water | 9056A | |
| 280-101020-6 DU | SB-2017-02-62-64 | Total/NA | Water | 9056A | |

### Analysis Batch: 387314

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-101020-1 | SB-2017-05-22-24 | Total/NA | Water | SM 2320B | |
| 280-101020-2 | SB-2017-05-32-34 | Total/NA | Water | SM 2320B | |
| 280-101020-3 | SB-2017-02-32-34 | Total/NA | Water | SM 2320B | |
| 280-101020-4 | SB-2017-02-42-44 | Total/NA | Water | SM 2320B | |
| 280-101020-5 | SB-2017-02-52-54 | Total/NA | Water | SM 2320B | |
| 280-101020-6 | SB-2017-02-62-64 | Total/NA | Water | SM 2320B | |
| 280-101020-7 | SB-2017-02-72-74 | Total/NA | Water | SM 2320B | |
| 280-101020-8 | SB-2017-05-42-44 | Total/NA | Water | SM 2320B | |
| 280-101020-9 | SB-2017-05-52-54 | Total/NA | Water | SM 2320B | |
| 280-101020-10 | SB-2017-05-62-64 | Total/NA | Water | SM 2320B | |
| 280-101020-11 | SB-2017-05-72-74 | Total/NA | Water | SM 2320B | |
| MB 280-387314/31 | Method Blank | Total/NA | Water | SM 2320B | |

## General Chemistry (Continued)

### Analysis Batch: 387314 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| MB 280-387314/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-387314/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| LCS 280-387314/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 280-101020-4 DU | SB-2017-02-42-44 | Total/NA | Water | SM 2320B | |

### Analysis Batch: 387948

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-101020-1 | SB-2017-05-22-24 | Dissolved | Water | 9060 | |
| 280-101020-2 | SB-2017-05-32-34 | Dissolved | Water | 9060 | |
| 280-101020-3 | SB-2017-02-32-34 | Dissolved | Water | 9060 | |
| 280-101020-4 | SB-2017-02-42-44 | Dissolved | Water | 9060 | |
| 280-101020-5 | SB-2017-02-52-54 | Dissolved | Water | 9060 | |
| 280-101020-6 | SB-2017-02-62-64 | Dissolved | Water | 9060 | |
| 280-101020-7 | SB-2017-02-72-74 | Dissolved | Water | 9060 | |
| 280-101020-8 | SB-2017-05-42-44 | Dissolved | Water | 9060 | |
| 280-101020-9 | SB-2017-05-52-54 | Dissolved | Water | 9060 | |
| 280-101020-10 | SB-2017-05-62-64 | Dissolved | Water | 9060 | |
| 280-101020-11 | SB-2017-05-72-74 | Dissolved | Water | 9060 | |
| MB 280-387948/37 | Method Blank | Dissolved | Water | 9060 | |
| MB 280-387948/4 | Method Blank | Dissolved | Water | 9060 | |
| LCS 280-387948/3 | Lab Control Sample | Dissolved | Water | 9060 | |
| LCS 280-387948/36 | Lab Control Sample | Dissolved | Water | 9060 | |
| 280-101020-6 MS | SB-2017-02-62-64 | Dissolved | Water | 9060 | |
| 280-101020-6 MSD | SB-2017-02-62-64 | Dissolved | Water | 9060 | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

## Client Sample ID: SB-2017-05-22-24 — Lab Sample ID: 280-101020-1

**Date Collected: 09/07/17 12:45** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387482 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387766 | 09/14/17 22:44 | CML | TAL DEN |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387483 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387740 | 09/14/17 21:42 | LRD | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387205 | 09/11/17 20:10 | TLP | TAL DEN |
| Dissolved | Analysis | 9060 | | 1 | | | 387948 | 09/14/17 19:25 | CCJ | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387314 | 09/11/17 17:20 | A1D | TAL DEN |

## Client Sample ID: SB-2017-05-32-34 — Lab Sample ID: 280-101020-2

**Date Collected: 09/07/17 15:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387482 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387766 | 09/14/17 22:47 | CML | TAL DEN |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387483 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387740 | 09/14/17 21:46 | LRD | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387205 | 09/11/17 20:28 | TLP | TAL DEN |
| Dissolved | Analysis | 9060 | | 1 | | | 387948 | 09/14/17 19:40 | CCJ | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387314 | 09/11/17 17:15 | A1D | TAL DEN |

## Client Sample ID: SB-2017-02-32-34 — Lab Sample ID: 280-101020-3

**Date Collected: 09/07/17 09:30** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387482 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387766 | 09/14/17 23:00 | CML | TAL DEN |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387483 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387740 | 09/14/17 21:49 | LRD | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387205 | 09/11/17 21:21 | TLP | TAL DEN |
| Dissolved | Analysis | 9060 | | 1 | | | 387948 | 09/14/17 21:15 | CCJ | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387314 | 09/11/17 17:10 | A1D | TAL DEN |

## Client Sample ID: SB-2017-02-42-44 — Lab Sample ID: 280-101020-4

**Date Collected: 09/07/17 10:55** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387482 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387766 | 09/14/17 23:03 | CML | TAL DEN |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387483 | 09/14/17 07:36 | TEB | TAL DEN |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

## Client Sample ID: SB-2017-02-42-44 — Lab Sample ID: 280-101020-4

**Date Collected: 09/07/17 10:55** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 6020A | | 1 | | | 387740 | 09/14/17 21:53 | LRD | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387205 | 09/11/17 21:38 | TLP | TAL DEN |
| Dissolved | Analysis | 9060 | | 1 | | | 387948 | 09/14/17 21:32 | CCJ | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387314 | 09/11/17 13:33 | A1D | TAL DEN |

## Client Sample ID: SB-2017-02-52-54 — Lab Sample ID: 280-101020-5

**Date Collected: 09/07/17 12:15** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387482 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387766 | 09/14/17 23:05 | CML | TAL DEN |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387483 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387740 | 09/14/17 21:57 | LRD | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387205 | 09/11/17 21:56 | TLP | TAL DEN |
| Dissolved | Analysis | 9060 | | 1 | | | 387948 | 09/14/17 21:49 | CCJ | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387314 | 09/11/17 13:43 | A1D | TAL DEN |

## Client Sample ID: SB-2017-02-62-64 — Lab Sample ID: 280-101020-6

**Date Collected: 09/07/17 13:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387482 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387766 | 09/14/17 22:32 | CML | TAL DEN |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387483 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387740 | 09/14/17 22:12 | LRD | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387205 | 09/11/17 22:14 | TLP | TAL DEN |
| Dissolved | Analysis | 9060 | | 1 | | | 387948 | 09/14/17 22:05 | CCJ | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387314 | 09/11/17 14:02 | A1D | TAL DEN |

## Client Sample ID: SB-2017-02-72-74 — Lab Sample ID: 280-101020-7

**Date Collected: 09/07/17 15:30** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387482 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387766 | 09/14/17 23:08 | CML | TAL DEN |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387483 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387740 | 09/14/17 22:31 | LRD | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387205 | 09/11/17 23:25 | TLP | TAL DEN |
| Dissolved | Analysis | 9060 | | 1 | | | 387948 | 09/14/17 22:52 | CCJ | TAL DEN |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

## Client Sample ID: SB-2017-02-72-74 — Lab Sample ID: 280-101020-7

**Date Collected: 09/07/17 15:30** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | SM 2320B | | 1 | | | 387314 | 09/11/17 13:48 | A1D | TAL DEN |

## Client Sample ID: SB-2017-05-42-44 — Lab Sample ID: 280-101020-8

**Date Collected: 09/08/17 09:25** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387482 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387766 | 09/14/17 23:10 | CML | TAL DEN |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387483 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387740 | 09/14/17 22:35 | LRD | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387205 | 09/11/17 23:42 | TLP | TAL DEN |
| Dissolved | Analysis | 9060 | | 1 | | | 387948 | 09/14/17 23:09 | CCJ | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387314 | 09/11/17 13:53 | A1D | TAL DEN |

## Client Sample ID: SB-2017-05-52-54 — Lab Sample ID: 280-101020-9

**Date Collected: 09/08/17 10:50** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387482 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387766 | 09/14/17 23:13 | CML | TAL DEN |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387483 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387740 | 09/14/17 22:39 | LRD | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387205 | 09/12/17 00:00 | TLP | TAL DEN |
| Dissolved | Analysis | 9060 | | 1 | | | 387948 | 09/14/17 23:26 | CCJ | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387314 | 09/11/17 14:07 | A1D | TAL DEN |

## Client Sample ID: SB-2017-05-62-64 — Lab Sample ID: 280-101020-10

**Date Collected: 09/08/17 12:35** — **Matrix: Water**
**Date Received: 09/09/17 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387482 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387766 | 09/14/17 23:16 | CML | TAL DEN |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387483 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387740 | 09/14/17 22:42 | LRD | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387205 | 09/12/17 00:53 | TLP | TAL DEN |
| Dissolved | Analysis | 9060 | | 1 | | | 387948 | 09/14/17 23:44 | CCJ | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387314 | 09/11/17 14:12 | A1D | TAL DEN |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

## Client Sample ID: SB-2017-05-72-74

**Lab Sample ID: 280-101020-11**

**Date Collected: 09/08/17 14:10**

**Matrix: Water**

**Date Received: 09/09/17 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387482 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387766 | 09/14/17 23:18 | CML | TAL DEN |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387483 | 09/14/17 07:36 | TEB | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387740 | 09/14/17 22:46 | LRD | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387205 | 09/12/17 01:11 | TLP | TAL DEN |
| Dissolved | Analysis | 9060 | | 1 | | | 387948 | 09/15/17 00:33 | CCJ | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387314 | 09/11/17 13:57 | A1D | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

280-101020 Chain of Custody

| 1081.003 | 0913-757 | Devens - SHL LPA SOW Phase I Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: | of:

KGS

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: [illegible] Cell: [illegible]

Sampled by (Print Name(s))/Affiliation: Kerry Holbrook / KGS

Sampler(s) Signature(s): [illegible]

Laboratory: Test America - Savannah
Address: 5102 LaRoche Avenue, Savannah, GA 31404
Contact: Lee Lanier (912) 354-7858
Regulatory Facility No.:
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT:
Other:

Preservatives (see codes): N | H | H | S | S | H | O | S

Analyses Requested: Dissolved Metals - SW 6010B (Fe, Mn, pick 10 NOT Fe, Mn); DOC - SW 9060A (Subset of Metals - Field Filtered); Sulfate - Chloride - SW 9056 (Cl, SO4 only); Alkalinity - SW 2320B (CO3, HCO3 only)

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals | DOC | Sulfate - Chloride | Alkalinity | | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-09-33-34 | 9-7-17 | 1345 | GW | 9 | X | X | X | X | | | | | | | | |
| SB-2017-09-33-44 | | 1535 | GW | 9 | X | X | X | X | | | | | | | | |
| SB-2017-09-52-54 | | 1330 | GW | 9 | X | X | X | X | | | | | | | | |
| SB-2017-09-52-64 | | 1025 | GW | 9 | X | X | X | X | | | | | | | | |
| SB-2017-09-52-54 | | 1215 | GW | 9 | X | X | X | X | | | | | | | | |
| SB-2017-09-62-61 | | 1325 | GW | 12 | X | X | X | X | | | | | | | Duplicate | 1345 |
| SB-2017-09-72-74 | | 1530 | GW | 9 | X | X | X | X | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | Kerry Holbrook / KGS | 9-7-17 | 1500 | | [illegible] | [illegible] | [illegible] |
| Additional Comments: | | | [illegible] | [illegible] | [illegible] | | [illegible] | 9-8-17 | 0950 |

email logins and results to:
[illegible]@kgsusa.com

Lab Comments
Seal #: Preserve Where Applicable ☐
On Ice ☐
Temperature 14.4 C
[illegible]

☐ Std Reduced
☐ Std Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | |
|---|---|---|---|---|---|
| MATRIX CODES | GW = Groundwater | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES | C = Composite | G = Grab | P = Pumping | | | O = Other |

| 1081-006 | PO#17-757 | Dawson - SHE CPA SOW Phase I Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: ___ of: ___

KGS

KOMAN Government Solutions, LLC

Address: [illegible]

Phone: [illegible] Cell: [illegible]

Sampled by [Print Name(s)] Affiliation: Kerr Holbrook / KGS

Sampler(s) Signature(s): [illegible]

Laboratory: [illegible]
Address: [illegible]
Contact: [illegible]
Regulatory Facility No.:
Project Name: Dawson Shipley's Dell Landfill
Sampling QA Plan No.:
Approval Date:
TAT:
Other:

Preservatives (see codes): N | I | I | S | S | I | O | S

Analyses Requested: Dissolved Metals (SW-6010B/6020) 1-250 ml poly; TPH (SW-8015B) HPH Diesel; Sulfate/Chloride (SW-9056) 1-125 ml poly; Alkalinity (SW-2320B) 1-125 ml poly

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals | TPH Diesel | Sulfate/Chloride | Alkalinity | | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-05-[illegible] | 9-8-17 | 935 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017-05-[illegible] | 9-8-17 | 1030 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017-05-[illegible]-17 | 9-8-17 | 1232 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017-05-[illegible]-17 | 9-8-17 | 1310 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017-[illegible] * | 9-8-17 | | GW | | | | | | | | | | | | | |
| SB-2017-[illegible] | | | GW | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| *Revised Collection date per L. KGS 9/13/17 [illegible] | | | | | | | | | | | | | | | | |

Shipping Details: courier pick up

← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | [illegible] / KGS | 9-7-17 | 1500 | | [illegible] | [illegible] | [illegible] |
| Additional Comments: | | | [illegible] | [illegible] | [illegible] | | [illegible] | 9-8-17 | 1950 |

email logins and results to:

Lab Comments

Sent to: Preserve Where Applicable ☐ On Ice ☐

Temperature ___ °C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES | GW = Groundwater | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES | C = Composite | G = Grab | P = Pumping | | | O = Other |

# Login Sample Receipt Checklist

Client: KOMAN Government Solutions, LLC

Job Number: 280-101020-1

**Login Number: 101020**
**List Number: 1**
**Creator: Pottruff, Reed W**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | | |
| The cooler's custody seal, if present, is intact. | | |
| Sample custody seals, if present, are intact. | | |
| The cooler or samples do not appear to have been compromised or tampered with. | | |
| Samples were received on ice. | | |
| Cooler Temperature is acceptable. | | |
| Cooler Temperature is recorded. | | |
| COC is present. | | |
| COC is filled out in ink and legible. | | |
| COC is filled out with all pertinent information. | | |
| Is the Field Sampler's name present on COC? | | |
| There are no discrepancies between the containers received and the COC. | | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | | |
| Sample containers have legible labels. | | |
| Containers are not broken or leaking. | | |
| Sample collection date/times are provided. | | |
| Appropriate sample containers are used. | | |
| Sample bottles are completely filled. | | |
| Sample Preservation Verified. | | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | | |
| Multiphasic samples are not present. | | |
| Samples do not require splitting or compositing. | | |
| Residual Chlorine Checked. | | |

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 280-101020-1

## Laboratory: TestAmerica Denver

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

| Analysis Method | Prep Method | Matrix | Analyte |
|---|---|---|---|
| 9060 | | Water | Dissolved Organic Carbon - Duplicate |

## Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| | AFCEE | | SAVLAB | |
| Alabama | State Program | 4 | 41450 | 06-30-18 |
| Alaska | State Program | 10 | | 06-30-18 |
| Alaska (UST) | State Program | 10 | UST-104 | 11-05-17 * |
| Arizona | State Program | 9 | AZ808 | 12-14-17 |
| Arkansas DEQ | State Program | 6 | 88-0692 | 02-01-18 |
| California | State Program | 9 | 2939 | 06-30-17 * |
| Colorado | State Program | 8 | N/A | 12-31-17 |
| Connecticut | State Program | 1 | PH-0161 | 03-31-19 |
| Florida | NELAP | 4 | E87052 | 06-30-18 |
| GA Dept. of Agriculture | State Program | 4 | N/A | 06-12-18 |
| Georgia | State Program | 4 | 803 | 06-30-18 |
| Guam | State Program | 9 | 15-005r | 04-16-18 |
| Hawaii | State Program | 9 | N/A | 06-30-18 |
| Illinois | NELAP | 5 | 200022 | 11-30-17 |
| Indiana | State Program | 5 | N/A | 06-30-18 |
| Iowa | State Program | 7 | 353 | 06-30-19 |
| Kentucky (DW) | State Program | 4 | 90084 | 12-31-17 |
| Kentucky (UST) | State Program | 4 | 18 | 06-30-18 |
| Kentucky (WW) | State Program | 4 | 90084 | 12-31-17 |
| L-A-B | DoD ELAP | | L2463 | 09-22-19 |
| L-A-B | ISO/IEC 17025 | | L2463.01 | 09-22-19 |
| Louisiana | NELAP | 6 | 30690 | 06-30-18 |
| Louisiana (DW) | NELAP | 6 | LA160019 | 12-31-17 |
| Maine | State Program | 1 | GA00006 | 09-24-18 |
| Maryland | State Program | 3 | 250 | 12-31-17 |
| Massachusetts | State Program | 1 | M-GA006 | 06-30-18 |
| Michigan | State Program | 5 | 9925 | 06-30-17 * |
| Mississippi | State Program | 4 | N/A | 06-30-18 |
| Nebraska | State Program | 7 | TestAmerica-Savannah | 06-30-18 |
| New Jersey | NELAP | 2 | GA769 | 06-30-18 |
| New Mexico | State Program | 6 | N/A | 06-30-18 |
| New York | NELAP | 2 | 10842 | 03-31-18 |
| North Carolina (DW) | State Program | 4 | 13701 | 07-31-18 |
| North Carolina (WW/SW) | State Program | 4 | 269 | 12-31-17 |
| Oklahoma | State Program | 6 | 9984 | 08-31-18 |
| Pennsylvania | NELAP | 3 | 68-00474 | 06-30-18 |
| Puerto Rico | State Program | 2 | GA00006 | 12-31-17 |
| South Carolina | State Program | 4 | 98001 | 06-30-17 * |
| Tennessee | State Program | 4 | TN02961 | 06-30-18 |
| Texas | NELAP | 6 | T104704185-16-9 | 11-30-17 |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

## Laboratory: TestAmerica Savannah (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| Texas | State Program | 6 | T104704185 | 06-30-18 |
| US Fish & Wildlife | Federal | | LE058448-0 | 07-31-18 |
| USDA | Federal | | SAV 3-04 | 06-14-20 * |
| Virginia | NELAP | 3 | 460161 | 06-14-18 |
| Washington | State Program | 10 | C805 | 06-10-18 |
| West Virginia (DW) | State Program | 3 | 9950C | 12-31-17 |
| West Virginia DEP | State Program | 3 | 094 | 06-30-18 |
| Wisconsin | State Program | 5 | 999819810 | 08-31-18 |
| Wyoming | State Program | 8 | 8TMS-L | 06-30-16 * |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

TestAmerica Job ID: 680-142686-1
Client Project/Site: Devens - SHL EPA SOW Phase 1

For:
KOMAN Government Solutions, LLC
293 Boston Post Road
Suite 100
Marlborough, Massachusetts 01752

Attn: Laurie Ekes

*Authorized for release by:*
*9/15/2017 4:12:05 PM*

Jerry Lanier, Project Manager I
(912)354-7858 e.3410
jerry.lanier@testamericainc.com

LINKS

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Visit us at:
www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Job ID: 680-142686-1

**Laboratory: TestAmerica Savannah**

**Narrative**

# CASE NARRATIVE

## Client: KOMAN Government Solutions, LLC

## Project: Devens - SHL EPA SOW Phase 1

## Report Number: 680-142686-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 08/31/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.1º C and 3.5º C.

**METALS (ICP) - DISSOLVED**
Samples SB-2017-10-72-74 (680-142686-1), SB-2017-12-42-44 (680-142686-2), SB-2017-12-52-54 (680-142686-3), SB-2017-11-22-24 (680-142686-4), SB-2017-11-32-34 (680-142686-5), SB-2017-11-42-44 (680-142686-6), SB-2017-DUP-04 (680-142686-7), SB-2017-11-52-54 (680-142686-8), SB-2017-12-62-64 (680-142686-9), SB-2017-11-62-64 (680-142686-10), SB-2017-11-72-74 (680-142686-11), SB-2017-01-22-24 (680-142686-12), SB-2017-01-32-34 (680-142686-13), SB-2017-12-72-74 (680-142686-14), SB-2017-12-82-84 (680-142686-15), SB-2017-12-92-94 (680-142686-16), SB-2017-12-99-101 (680-142686-17), SB-2017-01-42-44 (680-142686-18), SB-2017-01-52-54 (680-142686-19), SB-2017-01-62-64 (680-142686-20) and SB-2017-DUP-05 (680-142686-21) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/01/2017 and analyzed on 09/05/2017.

Iron failed the recovery criteria low for the MS/MSD of sample SB-2017-01-52-54MSD (680-142686-19) in batch 680-494202.

Iron failed the recovery criteria high for the MS of sample SB-2017-11-42-44MS (680-142686-6) in batch 680-494202.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples SB-2017-10-72-74 (680-142686-1), SB-2017-12-42-44 (680-142686-2), SB-2017-12-52-54 (680-142686-3), SB-2017-11-22-24 (680-142686-4), SB-2017-11-32-34 (680-142686-5), SB-2017-11-42-44 (680-142686-6), SB-2017-DUP-04 (680-142686-7), SB-2017-11-52-54 (680-142686-8), SB-2017-12-62-64 (680-142686-9), SB-2017-11-62-64 (680-142686-10), SB-2017-11-72-74 (680-142686-11), SB-2017-01-22-24 (680-142686-12), SB-2017-01-32-34 (680-142686-13), SB-2017-12-72-74 (680-142686-14), SB-2017-12-82-84 (680-142686-15), SB-2017-12-92-94 (680-142686-16), SB-2017-12-99-101 (680-142686-17), SB-2017-01-42-44 (680-142686-18), SB-2017-01-52-54 (680-142686-19), SB-2017-01-62-64 (680-142686-20) and SB-2017-DUP-05 (680-142686-21) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 09/01/2017 and analyzed on 09/01/2017 and 09/06/2017.

Arsenic failed the recovery criteria low for the MS/MSD of sample SB-2017-01-52-54 (680-142686-19) in batch 680-494377.

Arsenic failed the recovery criteria low for the MS of sample SB-2017-11-42-44MS (680-142686-6) in batch 680-494003.

## Job ID: 680-142686-1 (Continued)

### Laboratory: TestAmerica Savannah (Continued)

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**

Samples SB-2017-10-72-74 (680-142686-1), SB-2017-12-42-44 (680-142686-2), SB-2017-12-52-54 (680-142686-3), SB-2017-11-22-24 (680-142686-4), SB-2017-11-32-34 (680-142686-5), SB-2017-11-42-44 (680-142686-6), SB-2017-DUP-04 (680-142686-7), SB-2017-11-52-54 (680-142686-8), SB-2017-12-62-64 (680-142686-9), SB-2017-11-62-64 (680-142686-10), SB-2017-11-72-74 (680-142686-11), SB-2017-01-22-24 (680-142686-12), SB-2017-01-32-34 (680-142686-13), SB-2017-12-72-74 (680-142686-14), SB-2017-12-82-84 (680-142686-15), SB-2017-12-92-94 (680-142686-16), SB-2017-12-99-101 (680-142686-17), SB-2017-01-42-44 (680-142686-18), SB-2017-01-52-54 (680-142686-19), SB-2017-01-62-64 (680-142686-20) and SB-2017-DUP-05 (680-142686-21) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 08/31/2017 and 09/05/2017.

Alkalinity was detected in method blank MB 280-386425/31 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Alkalinity was detected in method blank MB 280-386425/5 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Alkalinity was detected in method blank MB 280-386701/5 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**PH**

Samples SB-2017-11-22-24 (680-142686-4), SB-2017-11-32-34 (680-142686-5) and SB-2017-11-42-44 (680-142686-6) were analyzed for pH in accordance with EPA SW-846 Method 9040C. The samples were analyzed on 08/31/2017.

This analysis is considered a field test and is to be performed within 15 minutes of collection. This sample(s) was performed in the laboratory outside the 15 minute timeframe.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**

Samples SB-2017-10-72-74 (680-142686-1), SB-2017-12-42-44 (680-142686-2), SB-2017-12-52-54 (680-142686-3), SB-2017-11-22-24 (680-142686-4), SB-2017-11-32-34 (680-142686-5), SB-2017-11-42-44 (680-142686-6), SB-2017-DUP-04 (680-142686-7), SB-2017-11-52-54 (680-142686-8), SB-2017-12-62-64 (680-142686-9), SB-2017-11-62-64 (680-142686-10), SB-2017-11-72-74 (680-142686-11), SB-2017-01-22-24 (680-142686-12), SB-2017-01-32-34 (680-142686-13), SB-2017-12-72-74 (680-142686-14), SB-2017-12-82-84 (680-142686-15), SB-2017-12-92-94 (680-142686-16), SB-2017-12-99-101 (680-142686-17), SB-2017-01-42-44 (680-142686-18), SB-2017-01-52-54 (680-142686-19), SB-2017-01-62-64 (680-142686-20) and SB-2017-DUP-05 (680-142686-21) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 09/13/2017 and 09/14/2017.

Sulfate failed the recovery criteria low for the MS/MSD of sample 680-142847-7 in batch 680-494586.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**DISSOLVED ORGANIC CARBON**

Samples SB-2017-10-72-74 (680-142686-1), SB-2017-12-42-44 (680-142686-2), SB-2017-12-52-54 (680-142686-3), SB-2017-11-22-24 (680-142686-4), SB-2017-11-32-34 (680-142686-5), SB-2017-11-42-44 (680-142686-6), SB-2017-DUP-04 (680-142686-7),

## Job ID: 680-142686-1 (Continued)

### Laboratory: TestAmerica Savannah (Continued)

SB-2017-11-52-54 (680-142686-8), SB-2017-12-62-64 (680-142686-9), SB-2017-11-62-64 (680-142686-10), SB-2017-11-72-74 (680-142686-11), SB-2017-01-22-24 (680-142686-12), SB-2017-01-32-34 (680-142686-13), SB-2017-12-72-74 (680-142686-14), SB-2017-12-82-84 (680-142686-15), SB-2017-12-92-94 (680-142686-16), SB-2017-12-99-101 (680-142686-17), SB-2017-01-42-44 (680-142686-18), SB-2017-01-52-54 (680-142686-19), SB-2017-01-62-64 (680-142686-20) and SB-2017-DUP-05 (680-142686-21) were analyzed for dissolved organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 09/01/2017 and 09/02/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 680-142686-1 | SB-2017-10-72-74 | Water | 08/25/17 16:10 | 08/31/17 09:20 |
| 680-142686-2 | SB-2017-12-42-44 | Water | 08/28/17 14:10 | 08/31/17 09:20 |
| 680-142686-3 | SB-2017-12-52-54 | Water | 08/28/17 15:55 | 08/31/17 09:20 |
| 680-142686-4 | SB-2017-11-22-24 | Water | 08/28/17 11:40 | 08/31/17 09:20 |
| 680-142686-5 | SB-2017-11-32-34 | Water | 08/28/17 13:15 | 08/31/17 09:20 |
| 680-142686-6 | SB-2017-11-42-44 | Water | 08/28/17 14:50 | 08/31/17 09:20 |
| 680-142686-7 | SB-2017-DUP-04 | Water | 08/28/17 13:25 | 08/31/17 09:20 |
| 680-142686-8 | SB-2017-11-52-54 | Water | 08/28/17 16:25 | 08/31/17 09:20 |
| 680-142686-9 | SB-2017-12-62-64 | Water | 08/28/17 09:35 | 08/31/17 09:20 |
| 680-142686-10 | SB-2017-11-62-64 | Water | 08/29/17 09:50 | 08/31/17 09:20 |
| 680-142686-11 | SB-2017-11-72-74 | Water | 08/29/17 11:10 | 08/31/17 09:20 |
| 680-142686-12 | SB-2017-01-22-24 | Water | 08/29/17 13:30 | 08/31/17 09:20 |
| 680-142686-13 | SB-2017-01-32-34 | Water | 08/29/17 15:45 | 08/31/17 09:20 |
| 680-142686-14 | SB-2017-12-72-74 | Water | 08/29/17 11:30 | 08/31/17 09:20 |
| 680-142686-15 | SB-2017-12-82-84 | Water | 08/29/17 14:00 | 08/31/17 09:20 |
| 680-142686-16 | SB-2017-12-92-94 | Water | 08/29/17 16:10 | 08/31/17 09:20 |
| 680-142686-17 | SB-2017-12-99-101 | Water | 08/30/17 10:10 | 08/31/17 09:20 |
| 680-142686-18 | SB-2017-01-42-44 | Water | 08/30/17 09:10 | 08/31/17 09:20 |
| 680-142686-19 | SB-2017-01-52-54 | Water | 08/30/17 10:20 | 08/31/17 09:20 |
| 680-142686-20 | SB-2017-01-62-64 | Water | 08/30/17 12:00 | 08/31/17 09:20 |
| 680-142686-21 | SB-2017-DUP-05 | Water | 08/30/17 12:10 | 08/31/17 09:20 |

# Method Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9040C | pH | SW846 | TAL SAV |
| 9060 | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| M | Manual integrated compound. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| HF | Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-10-72-74

**Lab Sample ID: 680-142686-1**

**Date Collected: 08/25/17 16:10**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 22 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 00:33 | 1 |
| Sulfate | 14 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 00:33 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 48000 | | 50 | 50 | 17 | ug/L | | 09/05/17 23:17 | 1 |
| Manganese | 5600 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 23:17 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2500 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 18:42 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 180 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/05/17 15:04 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.8 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 15:32 | 1 |

## Client Sample ID: SB-2017-12-42-44

**Lab Sample ID: 680-142686-2**

**Date Collected: 08/28/17 14:10**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.2 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 00:50 | 1 |
| Sulfate | 7.9 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 00:50 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 7800 | | 50 | 50 | 17 | ug/L | | 09/05/17 23:12 | 1 |
| Manganese | 5400 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 23:12 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 5.3 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 18:39 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 53 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/05/17 15:09 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.1 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 15:49 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-12-52-54

**Lab Sample ID: 680-142686-3**

**Date Collected: 08/28/17 15:55**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.2 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 01:07 | 1 |
| Sulfate | 6.0 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 01:07 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 21000 | | 50 | 50 | 17 | ug/L | | 09/05/17 22:30 | 1 |
| Manganese | 2300 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 22:30 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 90 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 18:17 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 64 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/05/17 15:35 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.3 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 16:36 | 1 |

## Client Sample ID: SB-2017-11-22-24

**Lab Sample ID: 680-142686-4**

**Date Collected: 08/28/17 11:40**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.52 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 01:25 | 1 |
| Sulfate | 3.3 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 01:25 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 15000 | | 50 | 50 | 17 | ug/L | | 09/05/17 23:01 | 1 |
| Manganese | 840 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 23:01 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 62 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 18:31 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 6.9 | HF | | | | SU | | 08/31/17 13:30 | 1 |
| Alkalinity | 26 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/05/17 15:26 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.6 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 16:50 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-11-32-34

**Lab Sample ID: 680-142686-5**

**Date Collected: 08/28/17 13:15**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.5 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 01:42 | 1 |
| Sulfate | 3.8 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 01:42 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 20000 | | 50 | 50 | 17 | ug/L | | 09/05/17 22:56 | 1 |
| Manganese | 2100 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 22:56 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 160 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 18:28 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 6.9 | HF | | | | SU | | 08/31/17 13:26 | 1 |
| Alkalinity | 35 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/05/17 15:30 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.9 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 17:07 | 1 |

## Client Sample ID: SB-2017-11-42-44

**Lab Sample ID: 680-142686-6**

**Date Collected: 08/28/17 14:50**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.8 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/13/17 23:40 | 1 |
| Sulfate | 5.9 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/13/17 23:40 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 29000 | J | 50 | 50 | 17 | ug/L | | 09/05/17 21:33 | 1 |
| Manganese | 590 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 21:33 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 63 | J | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 17:37 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 7.0 | HF | | | | SU | | 08/31/17 13:21 | 1 |
| Alkalinity | 110 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 16:43 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.0 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 17:24 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-DUP-04

**Lab Sample ID: 680-142686-7**
**Date Collected: 08/28/17 13:25**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.5 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 02:00 | 1 |
| Sulfate | 3.6 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 02:00 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 19000 | | 50 | 50 | 17 | ug/L | | 09/05/17 22:25 | 1 |
| Manganese | 2000 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 22:25 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 150 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 18:13 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 41 | | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 18:16 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.9 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 18:17 | 1 |

## Client Sample ID: SB-2017-11-52-54

**Lab Sample ID: 680-142686-8**
**Date Collected: 08/28/17 16:25**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 27 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 04:01 | 1 |
| Sulfate | 1.5 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 04:01 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 71000 | | 50 | 50 | 17 | ug/L | | 09/05/17 22:15 | 1 |
| Manganese | 3500 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 22:15 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 160 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 17:59 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 290 | | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 18:11 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 5.0 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 18:33 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-12-62-64

**Lab Sample ID: 680-142686-9**

**Date Collected: 08/28/17 09:35**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 13 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 04:19 | 1 |
| Sulfate | 3.3 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 04:19 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 34000 | | 50 | 50 | 17 | ug/L | | 09/05/17 22:10 | 1 |
| Manganese | 1300 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 22:10 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 110 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 17:55 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 110 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 17:21 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.6 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 18:50 | 1 |

## Client Sample ID: SB-2017-11-62-64

**Lab Sample ID: 680-142686-10**

**Date Collected: 08/29/17 09:50**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 16 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 04:36 | 1 |
| Sulfate | 0.55 | J M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 04:36 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 98000 | | 50 | 50 | 17 | ug/L | | 09/05/17 23:22 | 1 |
| Manganese | 990 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 23:22 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 430 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 18:46 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 250 | | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 18:05 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.5 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 19:07 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-11-72-74

**Lab Sample ID: 680-142686-11**

**Date Collected: 08/29/17 11:10**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 23 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 04:54 | 1 |
| Sulfate | 16 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 04:54 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 60000 | | 50 | 50 | 17 | ug/L | | 09/05/17 20:21 | 1 |
| Manganese | 1500 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 20:21 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1900 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/06/17 13:51 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 180 | | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 17:54 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.2 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 19:51 | 1 |

## Client Sample ID: SB-2017-01-22-24

**Lab Sample ID: 680-142686-12**

**Date Collected: 08/29/17 13:30**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.8 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 05:11 | 1 |
| Sulfate | 5.0 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 05:11 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 13000 | | 50 | 50 | 17 | ug/L | | 09/05/17 22:20 | 1 |
| Manganese | 580 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 22:20 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 51 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 18:02 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 87 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 17:26 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 5.9 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 20:08 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-01-32-34

**Lab Sample ID: 680-142686-13**

**Date Collected: 08/29/17 15:45**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.82 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 05:28 | 1 |
| Sulfate | 3.1 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 05:28 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 2200 | | 50 | 50 | 17 | ug/L | | 09/05/17 23:07 | 1 |
| Manganese | 82 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 23:07 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.9 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 18:35 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 35 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 16:53 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.5 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 20:23 | 1 |

## Client Sample ID: SB-2017-12-72-74

**Lab Sample ID: 680-142686-14**

**Date Collected: 08/29/17 11:30**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 06:38 | 1 |
| Sulfate | 3.9 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 06:38 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 39000 | | 50 | 50 | 17 | ug/L | | 09/05/17 23:38 | 1 |
| Manganese | 1700 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 23:38 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 87 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 19:04 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 120 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 16:58 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.3 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 20:38 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-12-82-84

**Lab Sample ID: 680-142686-15**

**Date Collected: 08/29/17 14:00**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 23 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 06:55 | 1 |
| Sulfate | 1.3 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 06:55 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 5900 | | 50 | 50 | 17 | ug/L | | 09/05/17 22:51 | 1 |
| Manganese | 16000 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 22:51 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 5.1 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 18:24 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 210 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 16:48 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.1 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 20:55 | 1 |

## Client Sample ID: SB-2017-12-92-94

**Lab Sample ID: 680-142686-16**

**Date Collected: 08/29/17 16:10**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 32 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 07:13 | 1 |
| Sulfate | 5.2 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 07:13 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 13000 | | 50 | 50 | 17 | ug/L | | 09/05/17 22:36 | 1 |
| Manganese | 12000 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 22:36 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 18 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 18:20 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 220 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 17:16 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.0 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 21:56 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-12-99-101

**Lab Sample ID: 680-142686-17**

**Date Collected: 08/30/17 10:10**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 35 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 07:30 | 1 |
| Sulfate | 7.9 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 07:30 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 960 | | 50 | 50 | 17 | ug/L | | 09/05/17 23:27 | 1 |
| Manganese | 15000 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 23:27 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 5.1 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 18:57 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 280 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 17:11 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.7 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 22:13 | 1 |

## Client Sample ID: SB-2017-01-42-44

**Lab Sample ID: 680-142686-18**

**Date Collected: 08/30/17 09:10**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 11 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 07:48 | 1 |
| Sulfate | 0.70 | J M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 07:48 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 85000 | | 50 | 50 | 17 | ug/L | | 09/05/17 23:33 | 1 |
| Manganese | 1700 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 23:33 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 47 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 19:00 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 450 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 17:05 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 17 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 22:57 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-01-52-54

**Lab Sample ID: 680-142686-19**

**Date Collected: 08/30/17 10:20**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.4 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 03:09 | 1 |
| Sulfate | 0.65 | J M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 03:09 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 83000 | J | 50 | 50 | 17 | ug/L | | 09/05/17 19:55 | 1 |
| Manganese | 1600 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 19:55 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 130 | J | 3.0 | 3.0 | 1.5 | ug/L | | 09/06/17 13:30 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 310 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 16:15 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 6.9 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 23:14 | 1 |

## Client Sample ID: SB-2017-01-62-64

**Lab Sample ID: 680-142686-20**

**Date Collected: 08/30/17 12:00**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.7 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 08:05 | 1 |
| Sulfate | 0.40 | J M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 08:05 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 71000 | | 50 | 50 | 17 | ug/L | | 09/05/17 23:53 | 1 |
| Manganese | 2000 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 23:53 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 81 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 19:07 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 330 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 16:38 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 7.8 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/02/17 00:04 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-DUP-05

**Lab Sample ID: 680-142686-21**

**Date Collected: 08/30/17 12:10**

**Matrix: Water**

**Date Received: 08/31/17 09:20**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.7 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/13/17 22:13 | 1 |
| Sulfate | 0.42 | J M | 1.0 | 1.0 | 0.40 | mg/L | | 09/13/17 22:13 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 74000 | | 50 | 50 | 17 | ug/L | | 09/05/17 23:59 | 1 |
| Manganese | 2100 | | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 23:59 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 96 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 19:11 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 320 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 16:21 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 7.7 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 14:23 | 1 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-494586/1004** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494586**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 09/13/17 13:49 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 09/13/17 13:49 | 1 |

**Lab Sample ID: LCS 680-494586/1036** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494586**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.77 | | mg/L | | 98 | 87 - 111 |
| Sulfate | 10.0 | 9.96 | M | mg/L | | 100 | 87 - 112 |

**Lab Sample ID: MB 680-494617/39** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494617**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 09/13/17 22:48 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 09/13/17 22:48 | 1 |

**Lab Sample ID: LCS 680-494617/40** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494617**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.75 | | mg/L | | 98 | 87 - 111 |
| Sulfate | 10.0 | 9.64 | | mg/L | | 96 | 87 - 112 |

**Lab Sample ID: LCSD 680-494617/41** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494617**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.76 | | mg/L | | 98 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 9.63 | | mg/L | | 96 | 87 - 112 | 0 | 15 |

**Lab Sample ID: 680-142686-6 MS** — **Client Sample ID: SB-2017-11-42-44**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494617**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.8 | | 10.0 | 16.9 | | mg/L | | 102 | 87 - 111 |
| Sulfate | 5.9 | M | 10.0 | 15.8 | M | mg/L | | 98 | 87 - 112 |

**Lab Sample ID: 680-142686-6 MSD** — **Client Sample ID: SB-2017-11-42-44**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494617**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.8 | | 10.0 | 17.0 | | mg/L | | 102 | 87 - 111 | 0 | 15 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: 680-142686-6 MSD** — **Client Sample ID: SB-2017-11-42-44**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494617**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 5.9 | M | 10.0 | 16.0 | M | mg/L | | 101 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-142686-19 MS** — **Client Sample ID: SB-2017-01-52-54**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494617**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.4 | | 10.0 | 15.7 | | mg/L | | 102 | 87 - 111 | | |
| Sulfate | 0.65 | J M | 10.0 | 10.2 | M | mg/L | | 96 | 87 - 112 | | |

**Lab Sample ID: 680-142686-19 MSD** — **Client Sample ID: SB-2017-01-52-54**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494617**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.4 | | 10.0 | 15.7 | | mg/L | | 103 | 87 - 111 | 0 | 15 |
| Sulfate | 0.65 | J M | 10.0 | 10.2 | M | mg/L | | 95 | 87 - 112 | 0 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-493803/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494202** — **Prep Batch: 493803**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 09/05/17 21:23 | 1 |
| Manganese | 3.0 | U | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 21:23 | 1 |

**Lab Sample ID: LCS 680-493803/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494202** — **Prep Batch: 493803**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | | | 5000 | 4920 | | ug/L | | 98 | 87 - 115 | | |
| Manganese | | | 500 | 523 | | ug/L | | 105 | 90 - 114 | | |

**Lab Sample ID: MB 680-493829/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494202** — **Prep Batch: 493829**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 09/05/17 19:44 | 1 |
| Manganese | 3.0 | U | 10 | 3.0 | 1.0 | ug/L | | 09/05/17 19:44 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 680-493829/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494202** — **Prep Batch: 493829**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4730 | | ug/L | | 95 | 87 - 115 |
| Manganese | 500 | 505 | | ug/L | | 101 | 90 - 114 |

**Lab Sample ID: 680-142686-6 MS** — **Client Sample ID: SB-2017-11-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 494202** — **Prep Batch: 493803**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 29000 | J | 5000 | 34700 | 4 | ug/L | | 119 | 87 - 115 |
| Manganese | 590 | | 500 | 1130 | | ug/L | | 107 | 90 - 114 |

**Lab Sample ID: 680-142686-6 MSD** — **Client Sample ID: SB-2017-11-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 494202** — **Prep Batch: 493803**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 29000 | J | 5000 | 34000 | 4 | ug/L | | 106 | 87 - 115 | 2 | 20 |
| Manganese | 590 | | 500 | 1120 | | ug/L | | 105 | 90 - 114 | 1 | 20 |

**Lab Sample ID: 680-142686-19 MS** — **Client Sample ID: SB-2017-01-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 494202** — **Prep Batch: 493829**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 83000 | J | 5000 | 89500 | 4 | ug/L | | 136 | 87 - 115 |
| Manganese | 1600 | | 500 | 2120 | | ug/L | | 106 | 90 - 114 |

**Lab Sample ID: 680-142686-19 MSD** — **Client Sample ID: SB-2017-01-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 494202** — **Prep Batch: 493829**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 83000 | J | 5000 | 84300 | 4 | ug/L | | 32 | 87 - 115 | 6 | 20 |
| Manganese | 1600 | | 500 | 2040 | | ug/L | | 91 | 90 - 114 | 4 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-493801/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494003** — **Prep Batch: 493801**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/01/17 17:30 | 1 |

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: LCS 680-493801/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494003** — **Prep Batch: 493801**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 103 | | ug/L | | 103 | 84 - 116 |

**Lab Sample ID: MB 680-493828/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494377** — **Prep Batch: 493828**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/06/17 13:21 | 1 |

**Lab Sample ID: LCS 680-493828/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494377** — **Prep Batch: 493828**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 105 | | ug/L | | 105 | 84 - 116 |

**Lab Sample ID: 680-142686-6 MS** — **Client Sample ID: SB-2017-11-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 494003** — **Prep Batch: 493801**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 63 | J | 100 | 146 | J | ug/L | | 83 | 84 - 116 |

**Lab Sample ID: 680-142686-6 MSD** — **Client Sample ID: SB-2017-11-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 494003** — **Prep Batch: 493801**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 63 | J | 100 | 155 | | ug/L | | 92 | 84 - 116 | 6 | 20 |

**Lab Sample ID: 680-142686-19 MS** — **Client Sample ID: SB-2017-01-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 494377** — **Prep Batch: 493828**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 130 | J | 100 | 189 | J | ug/L | | 55 | 84 - 116 |

**Lab Sample ID: 680-142686-19 MSD** — **Client Sample ID: SB-2017-01-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 494377** — **Prep Batch: 493828**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 130 | J | 100 | 214 | J | ug/L | | 80 | 84 - 116 | 13 | 20 |

## Method: 9040C - pH

**Lab Sample ID: LCS 680-493725/7** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493725**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| pH | 7.00 | 7.1 | | SU | | 101 | 63 - 158 |

## Method: 9060 - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-386547/35** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 386547**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 21:24 | 1 |

**Lab Sample ID: MB 280-386547/4** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 386547**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 09/01/17 12:48 | 1 |

**Lab Sample ID: LCS 280-386547/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 386547**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 25.0 | 25.9 | | mg/L | | 104 | 88 - 112 |

**Lab Sample ID: LCS 280-386547/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 386547**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 25.0 | 25.8 | | mg/L | | 103 | 88 - 112 |

**Lab Sample ID: 680-142686-6 MS** — **Client Sample ID: SB-2017-11-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 386547**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.0 | | 25.0 | 28.1 | | mg/L | | 101 | 88 - 112 |

**Lab Sample ID: 680-142686-6 MSD** — **Client Sample ID: SB-2017-11-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 386547**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.0 | | 25.0 | 28.4 | | mg/L | | 102 | 88 - 112 | 1 | 15 |

## Method: 9060 - Organic Carbon, Dissolved (DOC) (Continued)

**Lab Sample ID: 680-142686-19 MS** — **Client Sample ID: SB-2017-01-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 386547**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 6.9 | | 25.0 | 31.7 | | mg/L | | 99 | 88 - 112 |

**Lab Sample ID: 680-142686-19 MSD** — **Client Sample ID: SB-2017-01-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 386547**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 6.9 | | 25.0 | 31.6 | | mg/L | | 99 | 88 - 112 | 0 | 15 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-386425/31** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386425**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 2.48 | J | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 17:50 | 1 |

**Lab Sample ID: MB 280-386425/5** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386425**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.47 | J | 5.0 | 3.2 | 1.1 | mg/L | | 08/31/17 15:22 | 1 |

**Lab Sample ID: LCS 280-386425/30** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386425**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 218 | | mg/L | | 109 | 90 - 110 |

**Lab Sample ID: LCS 280-386425/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386425**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 193 | | mg/L | | 96 | 90 - 110 |

**Lab Sample ID: 680-142686-11 DU** — **Client Sample ID: SB-2017-11-72-74**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386425**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Alkalinity | 180 | | 174 | | mg/L | | 1 | 10 |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: MB 280-386701/5**
**Matrix: Water**
**Analysis Batch: 386701**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.40 | J | 5.0 | 3.2 | 1.1 | mg/L | | 09/05/17 14:12 | 1 |

**Lab Sample ID: LCS 280-386701/4**
**Matrix: Water**
**Analysis Batch: 386701**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 200 | | mg/L | | 100 | 90 - 110 |

# QC Association Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## HPLC/IC

### Analysis Batch: 494586

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-21 | SB-2017-DUP-05 | Total/NA | Water | 9056A | |
| MB 680-494586/1004 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-494586/1036 | Lab Control Sample | Total/NA | Water | 9056A | |

### Analysis Batch: 494617

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-1 | SB-2017-10-72-74 | Total/NA | Water | 9056A | |
| 680-142686-2 | SB-2017-12-42-44 | Total/NA | Water | 9056A | |
| 680-142686-3 | SB-2017-12-52-54 | Total/NA | Water | 9056A | |
| 680-142686-4 | SB-2017-11-22-24 | Total/NA | Water | 9056A | |
| 680-142686-5 | SB-2017-11-32-34 | Total/NA | Water | 9056A | |
| 680-142686-6 | SB-2017-11-42-44 | Total/NA | Water | 9056A | |
| 680-142686-7 | SB-2017-DUP-04 | Total/NA | Water | 9056A | |
| 680-142686-8 | SB-2017-11-52-54 | Total/NA | Water | 9056A | |
| 680-142686-9 | SB-2017-12-62-64 | Total/NA | Water | 9056A | |
| 680-142686-10 | SB-2017-11-62-64 | Total/NA | Water | 9056A | |
| 680-142686-11 | SB-2017-11-72-74 | Total/NA | Water | 9056A | |
| 680-142686-12 | SB-2017-01-22-24 | Total/NA | Water | 9056A | |
| 680-142686-13 | SB-2017-01-32-34 | Total/NA | Water | 9056A | |
| 680-142686-14 | SB-2017-12-72-74 | Total/NA | Water | 9056A | |
| 680-142686-15 | SB-2017-12-82-84 | Total/NA | Water | 9056A | |
| 680-142686-16 | SB-2017-12-92-94 | Total/NA | Water | 9056A | |
| 680-142686-17 | SB-2017-12-99-101 | Total/NA | Water | 9056A | |
| 680-142686-18 | SB-2017-01-42-44 | Total/NA | Water | 9056A | |
| 680-142686-19 | SB-2017-01-52-54 | Total/NA | Water | 9056A | |
| 680-142686-20 | SB-2017-01-62-64 | Total/NA | Water | 9056A | |
| MB 680-494617/39 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-494617/40 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-494617/41 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-142686-6 MS | SB-2017-11-42-44 | Total/NA | Water | 9056A | |
| 680-142686-6 MSD | SB-2017-11-42-44 | Total/NA | Water | 9056A | |
| 680-142686-19 MS | SB-2017-01-52-54 | Total/NA | Water | 9056A | |
| 680-142686-19 MSD | SB-2017-01-52-54 | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 493801

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-1 | SB-2017-10-72-74 | Dissolved | Water | 3005A | |
| 680-142686-2 | SB-2017-12-42-44 | Dissolved | Water | 3005A | |
| 680-142686-3 | SB-2017-12-52-54 | Dissolved | Water | 3005A | |
| 680-142686-4 | SB-2017-11-22-24 | Dissolved | Water | 3005A | |
| 680-142686-5 | SB-2017-11-32-34 | Dissolved | Water | 3005A | |
| 680-142686-6 | SB-2017-11-42-44 | Dissolved | Water | 3005A | |
| 680-142686-7 | SB-2017-DUP-04 | Dissolved | Water | 3005A | |
| 680-142686-8 | SB-2017-11-52-54 | Dissolved | Water | 3005A | |
| 680-142686-9 | SB-2017-12-62-64 | Dissolved | Water | 3005A | |
| 680-142686-10 | SB-2017-11-62-64 | Dissolved | Water | 3005A | |
| 680-142686-12 | SB-2017-01-22-24 | Dissolved | Water | 3005A | |
| 680-142686-13 | SB-2017-01-32-34 | Dissolved | Water | 3005A | |

## Metals (Continued)

### Prep Batch: 493801 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-14 | SB-2017-12-72-74 | Dissolved | Water | 3005A | |
| 680-142686-15 | SB-2017-12-82-84 | Dissolved | Water | 3005A | |
| 680-142686-16 | SB-2017-12-92-94 | Dissolved | Water | 3005A | |
| 680-142686-17 | SB-2017-12-99-101 | Dissolved | Water | 3005A | |
| 680-142686-18 | SB-2017-01-42-44 | Dissolved | Water | 3005A | |
| 680-142686-20 | SB-2017-01-62-64 | Dissolved | Water | 3005A | |
| 680-142686-21 | SB-2017-DUP-05 | Dissolved | Water | 3005A | |
| MB 680-493801/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-493801/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-142686-6 MS | SB-2017-11-42-44 | Dissolved | Water | 3005A | |
| 680-142686-6 MSD | SB-2017-11-42-44 | Dissolved | Water | 3005A | |

### Prep Batch: 493803

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-1 | SB-2017-10-72-74 | Dissolved | Water | 3005A | |
| 680-142686-2 | SB-2017-12-42-44 | Dissolved | Water | 3005A | |
| 680-142686-3 | SB-2017-12-52-54 | Dissolved | Water | 3005A | |
| 680-142686-4 | SB-2017-11-22-24 | Dissolved | Water | 3005A | |
| 680-142686-5 | SB-2017-11-32-34 | Dissolved | Water | 3005A | |
| 680-142686-6 | SB-2017-11-42-44 | Dissolved | Water | 3005A | |
| 680-142686-7 | SB-2017-DUP-04 | Dissolved | Water | 3005A | |
| 680-142686-8 | SB-2017-11-52-54 | Dissolved | Water | 3005A | |
| 680-142686-9 | SB-2017-12-62-64 | Dissolved | Water | 3005A | |
| 680-142686-10 | SB-2017-11-62-64 | Dissolved | Water | 3005A | |
| 680-142686-12 | SB-2017-01-22-24 | Dissolved | Water | 3005A | |
| 680-142686-13 | SB-2017-01-32-34 | Dissolved | Water | 3005A | |
| 680-142686-14 | SB-2017-12-72-74 | Dissolved | Water | 3005A | |
| 680-142686-15 | SB-2017-12-82-84 | Dissolved | Water | 3005A | |
| 680-142686-16 | SB-2017-12-92-94 | Dissolved | Water | 3005A | |
| 680-142686-17 | SB-2017-12-99-101 | Dissolved | Water | 3005A | |
| 680-142686-18 | SB-2017-01-42-44 | Dissolved | Water | 3005A | |
| 680-142686-20 | SB-2017-01-62-64 | Dissolved | Water | 3005A | |
| 680-142686-21 | SB-2017-DUP-05 | Dissolved | Water | 3005A | |
| MB 680-493803/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-493803/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-142686-6 MS | SB-2017-11-42-44 | Dissolved | Water | 3005A | |
| 680-142686-6 MSD | SB-2017-11-42-44 | Dissolved | Water | 3005A | |

### Prep Batch: 493828

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-11 | SB-2017-11-72-74 | Dissolved | Water | 3005A | |
| 680-142686-19 | SB-2017-01-52-54 | Dissolved | Water | 3005A | |
| MB 680-493828/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-493828/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-142686-19 MS | SB-2017-01-52-54 | Dissolved | Water | 3005A | |
| 680-142686-19 MSD | SB-2017-01-52-54 | Dissolved | Water | 3005A | |

### Prep Batch: 493829

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-11 | SB-2017-11-72-74 | Dissolved | Water | 3005A | |
| 680-142686-19 | SB-2017-01-52-54 | Dissolved | Water | 3005A | |

## Metals (Continued)

### Prep Batch: 493829 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| MB 680-493829/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-493829/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-142686-19 MS | SB-2017-01-52-54 | Dissolved | Water | 3005A | |
| 680-142686-19 MSD | SB-2017-01-52-54 | Dissolved | Water | 3005A | |

### Analysis Batch: 494003

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-1 | SB-2017-10-72-74 | Dissolved | Water | 6020A | 493801 |
| 680-142686-2 | SB-2017-12-42-44 | Dissolved | Water | 6020A | 493801 |
| 680-142686-3 | SB-2017-12-52-54 | Dissolved | Water | 6020A | 493801 |
| 680-142686-4 | SB-2017-11-22-24 | Dissolved | Water | 6020A | 493801 |
| 680-142686-5 | SB-2017-11-32-34 | Dissolved | Water | 6020A | 493801 |
| 680-142686-6 | SB-2017-11-42-44 | Dissolved | Water | 6020A | 493801 |
| 680-142686-7 | SB-2017-DUP-04 | Dissolved | Water | 6020A | 493801 |
| 680-142686-8 | SB-2017-11-52-54 | Dissolved | Water | 6020A | 493801 |
| 680-142686-9 | SB-2017-12-62-64 | Dissolved | Water | 6020A | 493801 |
| 680-142686-10 | SB-2017-11-62-64 | Dissolved | Water | 6020A | 493801 |
| 680-142686-12 | SB-2017-01-22-24 | Dissolved | Water | 6020A | 493801 |
| 680-142686-13 | SB-2017-01-32-34 | Dissolved | Water | 6020A | 493801 |
| 680-142686-14 | SB-2017-12-72-74 | Dissolved | Water | 6020A | 493801 |
| 680-142686-15 | SB-2017-12-82-84 | Dissolved | Water | 6020A | 493801 |
| 680-142686-16 | SB-2017-12-92-94 | Dissolved | Water | 6020A | 493801 |
| 680-142686-17 | SB-2017-12-99-101 | Dissolved | Water | 6020A | 493801 |
| 680-142686-18 | SB-2017-01-42-44 | Dissolved | Water | 6020A | 493801 |
| 680-142686-20 | SB-2017-01-62-64 | Dissolved | Water | 6020A | 493801 |
| 680-142686-21 | SB-2017-DUP-05 | Dissolved | Water | 6020A | 493801 |
| MB 680-493801/1-A | Method Blank | Total Recoverable | Water | 6020A | 493801 |
| LCS 680-493801/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 493801 |
| 680-142686-6 MS | SB-2017-11-42-44 | Dissolved | Water | 6020A | 493801 |
| 680-142686-6 MSD | SB-2017-11-42-44 | Dissolved | Water | 6020A | 493801 |

### Analysis Batch: 494202

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-1 | SB-2017-10-72-74 | Dissolved | Water | 6010C | 493803 |
| 680-142686-2 | SB-2017-12-42-44 | Dissolved | Water | 6010C | 493803 |
| 680-142686-3 | SB-2017-12-52-54 | Dissolved | Water | 6010C | 493803 |
| 680-142686-4 | SB-2017-11-22-24 | Dissolved | Water | 6010C | 493803 |
| 680-142686-5 | SB-2017-11-32-34 | Dissolved | Water | 6010C | 493803 |
| 680-142686-6 | SB-2017-11-42-44 | Dissolved | Water | 6010C | 493803 |
| 680-142686-7 | SB-2017-DUP-04 | Dissolved | Water | 6010C | 493803 |
| 680-142686-8 | SB-2017-11-52-54 | Dissolved | Water | 6010C | 493803 |
| 680-142686-9 | SB-2017-12-62-64 | Dissolved | Water | 6010C | 493803 |
| 680-142686-10 | SB-2017-11-62-64 | Dissolved | Water | 6010C | 493803 |
| 680-142686-11 | SB-2017-11-72-74 | Dissolved | Water | 6010C | 493829 |
| 680-142686-12 | SB-2017-01-22-24 | Dissolved | Water | 6010C | 493803 |
| 680-142686-13 | SB-2017-01-32-34 | Dissolved | Water | 6010C | 493803 |
| 680-142686-14 | SB-2017-12-72-74 | Dissolved | Water | 6010C | 493803 |
| 680-142686-15 | SB-2017-12-82-84 | Dissolved | Water | 6010C | 493803 |
| 680-142686-16 | SB-2017-12-92-94 | Dissolved | Water | 6010C | 493803 |
| 680-142686-17 | SB-2017-12-99-101 | Dissolved | Water | 6010C | 493803 |
| 680-142686-18 | SB-2017-01-42-44 | Dissolved | Water | 6010C | 493803 |

## Metals (Continued)

### Analysis Batch: 494202 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-19 | SB-2017-01-52-54 | Dissolved | Water | 6010C | 493829 |
| 680-142686-20 | SB-2017-01-62-64 | Dissolved | Water | 6010C | 493803 |
| 680-142686-21 | SB-2017-DUP-05 | Dissolved | Water | 6010C | 493803 |
| MB 680-493803/1-A | Method Blank | Total Recoverable | Water | 6010C | 493803 |
| MB 680-493829/1-A | Method Blank | Total Recoverable | Water | 6010C | 493829 |
| LCS 680-493803/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 493803 |
| LCS 680-493829/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 493829 |
| 680-142686-6 MS | SB-2017-11-42-44 | Dissolved | Water | 6010C | 493803 |
| 680-142686-6 MSD | SB-2017-11-42-44 | Dissolved | Water | 6010C | 493803 |
| 680-142686-19 MS | SB-2017-01-52-54 | Dissolved | Water | 6010C | 493829 |
| 680-142686-19 MSD | SB-2017-01-52-54 | Dissolved | Water | 6010C | 493829 |

### Analysis Batch: 494377

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-11 | SB-2017-11-72-74 | Dissolved | Water | 6020A | 493828 |
| 680-142686-19 | SB-2017-01-52-54 | Dissolved | Water | 6020A | 493828 |
| MB 680-493828/1-A | Method Blank | Total Recoverable | Water | 6020A | 493828 |
| LCS 680-493828/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 493828 |
| 680-142686-19 MS | SB-2017-01-52-54 | Dissolved | Water | 6020A | 493828 |
| 680-142686-19 MSD | SB-2017-01-52-54 | Dissolved | Water | 6020A | 493828 |

## General Chemistry

### Analysis Batch: 386425

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-6 | SB-2017-11-42-44 | Total/NA | Water | SM 2320B | |
| 680-142686-7 | SB-2017-DUP-04 | Total/NA | Water | SM 2320B | |
| 680-142686-8 | SB-2017-11-52-54 | Total/NA | Water | SM 2320B | |
| 680-142686-9 | SB-2017-12-62-64 | Total/NA | Water | SM 2320B | |
| 680-142686-10 | SB-2017-11-62-64 | Total/NA | Water | SM 2320B | |
| 680-142686-11 | SB-2017-11-72-74 | Total/NA | Water | SM 2320B | |
| 680-142686-12 | SB-2017-01-22-24 | Total/NA | Water | SM 2320B | |
| 680-142686-13 | SB-2017-01-32-34 | Total/NA | Water | SM 2320B | |
| 680-142686-14 | SB-2017-12-72-74 | Total/NA | Water | SM 2320B | |
| 680-142686-15 | SB-2017-12-82-84 | Total/NA | Water | SM 2320B | |
| 680-142686-16 | SB-2017-12-92-94 | Total/NA | Water | SM 2320B | |
| 680-142686-17 | SB-2017-12-99-101 | Total/NA | Water | SM 2320B | |
| 680-142686-18 | SB-2017-01-42-44 | Total/NA | Water | SM 2320B | |
| 680-142686-19 | SB-2017-01-52-54 | Total/NA | Water | SM 2320B | |
| 680-142686-20 | SB-2017-01-62-64 | Total/NA | Water | SM 2320B | |
| 680-142686-21 | SB-2017-DUP-05 | Total/NA | Water | SM 2320B | |
| MB 280-386425/31 | Method Blank | Total/NA | Water | SM 2320B | |
| MB 280-386425/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-386425/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| LCS 280-386425/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 680-142686-11 DU | SB-2017-11-72-74 | Total/NA | Water | SM 2320B | |

### Analysis Batch: 386547

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-1 | SB-2017-10-72-74 | Dissolved | Water | 9060 | |

## General Chemistry (Continued)

### Analysis Batch: 386547 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-2 | SB-2017-12-42-44 | Dissolved | Water | 9060 | |
| 680-142686-3 | SB-2017-12-52-54 | Dissolved | Water | 9060 | |
| 680-142686-4 | SB-2017-11-22-24 | Dissolved | Water | 9060 | |
| 680-142686-5 | SB-2017-11-32-34 | Dissolved | Water | 9060 | |
| 680-142686-6 | SB-2017-11-42-44 | Dissolved | Water | 9060 | |
| 680-142686-7 | SB-2017-DUP-04 | Dissolved | Water | 9060 | |
| 680-142686-8 | SB-2017-11-52-54 | Dissolved | Water | 9060 | |
| 680-142686-9 | SB-2017-12-62-64 | Dissolved | Water | 9060 | |
| 680-142686-10 | SB-2017-11-62-64 | Dissolved | Water | 9060 | |
| 680-142686-11 | SB-2017-11-72-74 | Dissolved | Water | 9060 | |
| 680-142686-12 | SB-2017-01-22-24 | Dissolved | Water | 9060 | |
| 680-142686-13 | SB-2017-01-32-34 | Dissolved | Water | 9060 | |
| 680-142686-14 | SB-2017-12-72-74 | Dissolved | Water | 9060 | |
| 680-142686-15 | SB-2017-12-82-84 | Dissolved | Water | 9060 | |
| 680-142686-16 | SB-2017-12-92-94 | Dissolved | Water | 9060 | |
| 680-142686-17 | SB-2017-12-99-101 | Dissolved | Water | 9060 | |
| 680-142686-18 | SB-2017-01-42-44 | Dissolved | Water | 9060 | |
| 680-142686-19 | SB-2017-01-52-54 | Dissolved | Water | 9060 | |
| 680-142686-20 | SB-2017-01-62-64 | Dissolved | Water | 9060 | |
| 680-142686-21 | SB-2017-DUP-05 | Dissolved | Water | 9060 | |
| MB 280-386547/35 | Method Blank | Dissolved | Water | 9060 | |
| MB 280-386547/4 | Method Blank | Dissolved | Water | 9060 | |
| LCS 280-386547/3 | Lab Control Sample | Dissolved | Water | 9060 | |
| LCS 280-386547/34 | Lab Control Sample | Dissolved | Water | 9060 | |
| 680-142686-6 MS | SB-2017-11-42-44 | Dissolved | Water | 9060 | |
| 680-142686-6 MSD | SB-2017-11-42-44 | Dissolved | Water | 9060 | |
| 680-142686-19 MS | SB-2017-01-52-54 | Dissolved | Water | 9060 | |
| 680-142686-19 MSD | SB-2017-01-52-54 | Dissolved | Water | 9060 | |

### Analysis Batch: 386701

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-1 | SB-2017-10-72-74 | Total/NA | Water | SM 2320B | |
| 680-142686-2 | SB-2017-12-42-44 | Total/NA | Water | SM 2320B | |
| 680-142686-3 | SB-2017-12-52-54 | Total/NA | Water | SM 2320B | |
| 680-142686-4 | SB-2017-11-22-24 | Total/NA | Water | SM 2320B | |
| 680-142686-5 | SB-2017-11-32-34 | Total/NA | Water | SM 2320B | |
| MB 280-386701/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-386701/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Analysis Batch: 493725

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142686-4 | SB-2017-11-22-24 | Total/NA | Water | 9040C | |
| 680-142686-5 | SB-2017-11-32-34 | Total/NA | Water | 9040C | |
| 680-142686-6 | SB-2017-11-42-44 | Total/NA | Water | 9040C | |
| LCS 680-493725/7 | Lab Control Sample | Total/NA | Water | 9040C | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-10-72-74

**Lab Sample ID: 680-142686-1**
**Date Collected: 08/25/17 16:10**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 00:33 | CJM | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 23:17 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 18:42 | BWR | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 15:32 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386701 | 09/05/17 15:04 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-12-42-44

**Lab Sample ID: 680-142686-2**
**Date Collected: 08/28/17 14:10**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 00:50 | CJM | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 23:12 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 18:39 | BWR | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 15:49 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386701 | 09/05/17 15:09 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-12-52-54

**Lab Sample ID: 680-142686-3**
**Date Collected: 08/28/17 15:55**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 01:07 | CJM | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 22:30 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-12-52-54

**Lab Sample ID: 680-142686-3**

**Date Collected: 08/28/17 15:55**

**Matrix: Water**

**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 18:17 | BWR | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 16:36 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386701 | 09/05/17 15:35 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-11-22-24

**Lab Sample ID: 680-142686-4**

**Date Collected: 08/28/17 11:40**

**Matrix: Water**

**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 01:25 | CJM | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 23:01 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 18:31 | BWR | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Total/NA | Analysis | 9040C | | 1 | | | 493725 | 08/31/17 13:30 | JEC | TAL SAV |
| | Instrument ID: | MANTECH | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 16:50 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386701 | 09/05/17 15:26 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-11-32-34

**Lab Sample ID: 680-142686-5**

**Date Collected: 08/28/17 13:15**

**Matrix: Water**

**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 01:42 | CJM | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 22:56 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 18:28 | BWR | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Total/NA | Analysis | 9040C | | 1 | | | 493725 | 08/31/17 13:26 | JEC | TAL SAV |
| | Instrument ID: | MANTECH | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-11-32-34

**Lab Sample ID: 680-142686-5**

**Date Collected: 08/28/17 13:15**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 17:07 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386701 | 09/05/17 15:30 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-11-42-44

**Lab Sample ID: 680-142686-6**

**Date Collected: 08/28/17 14:50**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/13/17 23:40 | CJM | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 21:33 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 17:37 | BWR | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Total/NA | Analysis | 9040C | | 1 | | | 493725 | 08/31/17 13:21 | JEC | TAL SAV |
| | Instrument ID: | MANTECH | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 17:24 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 16:43 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-DUP-04

**Lab Sample ID: 680-142686-7**

**Date Collected: 08/28/17 13:25**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 02:00 | CJM | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 22:25 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 18:13 | BWR | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 18:17 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 18:16 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-11-52-54 — Lab Sample ID: 680-142686-8

**Date Collected: 08/28/17 16:25** — **Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 04:01 | CJM | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 22:15 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 17:59 | BWR | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 18:33 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 18:11 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-12-62-64 — Lab Sample ID: 680-142686-9

**Date Collected: 08/28/17 09:35** — **Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 04:19 | CJM | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 22:10 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 17:55 | BWR | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 18:50 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 17:21 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-11-62-64 — Lab Sample ID: 680-142686-10

**Date Collected: 08/29/17 09:50** — **Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 04:36 | CJM | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 23:22 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 18:46 | BWR | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 19:07 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 18:05 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-11-72-74 — Lab Sample ID: 680-142686-11

**Date Collected: 08/29/17 11:10** — **Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 04:54 | CJM | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493829 | 09/01/17 11:07 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 20:21 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493828 | 09/01/17 11:07 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/06/17 13:51 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 19:51 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 17:54 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-01-22-24 — Lab Sample ID: 680-142686-12

**Date Collected: 08/29/17 13:30** — **Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 05:11 | CJM | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 22:20 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 18:02 | BWR | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 20:08 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 17:26 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-01-32-34 — Lab Sample ID: 680-142686-13

**Date Collected: 08/29/17 15:45** — **Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 05:28 | CJM | TAL SAV |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Client Sample ID: SB-2017-01-32-34

**Lab Sample ID: 680-142686-13**

**Date Collected: 08/29/17 15:45**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 05:28 | CJM | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 23:07 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 18:35 | BWR | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 20:23 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 16:53 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-12-72-74

**Lab Sample ID: 680-142686-14**

**Date Collected: 08/29/17 11:30**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 06:38 | CJM | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 23:38 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 19:04 | BWR | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 20:38 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 16:58 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-12-82-84

**Lab Sample ID: 680-142686-15**

**Date Collected: 08/29/17 14:00**
**Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 06:55 | CJM | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 22:51 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 18:24 | BWR | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 20:55 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 16:48 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-12-92-94 — Lab Sample ID: 680-142686-16

**Date Collected: 08/29/17 16:10** — **Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 07:13 | CJM | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 22:36 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 18:20 | BWR | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 21:56 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 17:16 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-12-99-101 — Lab Sample ID: 680-142686-17

**Date Collected: 08/30/17 10:10** — **Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 07:30 | CJM | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 23:27 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 18:57 | BWR | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 22:13 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 17:11 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-01-42-44 — Lab Sample ID: 680-142686-18

**Date Collected: 08/30/17 09:10** — **Matrix: Water**
**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 07:48 | CJM | TAL SAV |

## Client Sample ID: SB-2017-01-42-44

**Lab Sample ID: 680-142686-18**

**Date Collected: 08/30/17 09:10**

**Matrix: Water**

**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 07:48 | CJM | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 23:33 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 19:00 | BWR | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 22:57 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 17:05 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-01-52-54

**Lab Sample ID: 680-142686-19**

**Date Collected: 08/30/17 10:20**

**Matrix: Water**

**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 03:09 | CJM | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493829 | 09/01/17 11:07 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 19:55 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493828 | 09/01/17 11:07 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/06/17 13:30 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 23:14 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 16:15 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-01-62-64

**Lab Sample ID: 680-142686-20**

**Date Collected: 08/30/17 12:00**

**Matrix: Water**

**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494617 | 09/14/17 08:05 | CJM | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 23:53 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 19:07 | BWR | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/02/17 00:04 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 16:38 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-DUP-05

## Lab Sample ID: 680-142686-21

**Date Collected: 08/30/17 12:10**

**Matrix: Water**

**Date Received: 08/31/17 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494586 | 09/13/17 22:13 | UI | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493803 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494202 | 09/05/17 23:59 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493801 | 09/01/17 10:12 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494003 | 09/01/17 19:11 | BWR | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386547 | 09/01/17 14:23 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386425 | 08/31/17 16:21 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 | **Chain of Custody Record** | Page: 1 of: 3 |
|---|---|---|---|---|

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation: Marisb. Anton

Sampler(s) Signature(s): [signature]

Preservatives (see codes): N I I S S I O S

Analyses Requested

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | and PH | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-10-72-74 | 8/25/17 | 1610 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-12-42-44 | 8/28/17 | 1410 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-12-52-54 | 8/28/17 | 1555 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-11-22-24 | 8/28/17 | 1140 | GW | 4 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | |
| SB-2017-11-32-34 | 8/28/17 | 1315 | GW | 4 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | |
| SB-2017-11-42-44 | 8/28/17 | 1450 | GW | 12 | ✓ | ✓ | ✓ | ✓ | | | | | | MS/MSD | |
| SB-2017-DUP-04 | 8/28/17 | 1325 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-11-52-54 | 8/28/17 | 1625 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-12-62-64 | 8/29/17 | 935 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |

680-142686-01 Chain of Custody

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | [signature] | 1445 | 8-30-17 | [signature] | 8-30-17 | 1445 |
| Additional Comments: | | | [signature] | 1800 | 8-30-17 | [signature] | 8/31/17 | 0920 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal # _____ Preserve Where Applicable ☐ On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

3.2((F+Q-3)35

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 2 of: 3

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation: [signature]

Sampler(s) Signature(s): [signature]

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-11-62-64 | 8/29/17 | 950 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-11-72-74 | 8/29/17 | 1110 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-01-22-24 | 8/29/17 | 1330 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-01-32-34 | 8/29/17 | 1545 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-12-72-74 | 8/29/17 | 1130 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-12-82-84 | 8/29/17 | 1400 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-12-92-94 | 8/29/17 | 1610 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-12-99-101 | 8/30/17 | 1010 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-01-42-44 | 8/30/17 | 910 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |

680-142686-02 Chain of Custody

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | [signature] | 8-30-17 | 1445 | | [signature] | 8-30-17 | 1445 |
| Additional Comments: | | | [signature] | 8-30-17 | 1800 | | [signature] | 8/31/17 | 0920 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal # _____ Preserve Where Applicable ☐ On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

3.2((5+0.3)3.5

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

360325-Boston

360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 | **Chain of Custody Record** | Page: 3 of: 3 |
|---|---|---|---|---|

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation
Karen L. Anderson

Sampler(s) Signature(s)

Preservatives (see codes): N I I S S I O S

Analyses Requested

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-01-52-54 | 8/30/17 | 1020 | GW | 12 | ✓ | ✓ | ✓ | ✓ | | | | | | MS/MSD | |
| SB-2017-01-62-64 | 8/30/17 | 1200 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-DUP-05 | 8/30/17 | 1210 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017- | | | GW | | | | | | | | | | | | |
| SB-2017- | | | GW | | | | | | | | | | | | |
| SB-2017- | | | GW | | | | | | | | | | | | |

680-142686-03 Chain of Custody

Shipping Details courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | [signature] | 8-30-17 | 1445 | [signature] | 8-30-17 | 1445 |
| Additional Comments: | | | [signature] | 8-30-17 | 1800 | [signature] | 8/31/17 | 0920 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal # _____ Preserve Where Applicable ☐ On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

3.2((f+0.3)3.5

| | | | | | |
|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

360325-Boston

360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 1 of: 3

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation: Marib. Anton

Sampler(s) Signature(s): [signature]

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | ↑ and PH | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-10-72-74 | 8/25/17 | 1610 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-12-42-44 | 8/28/17 | 1410 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-12-52-54 | 8/28/17 | 1555 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-11-22-24 | 8/28/17 | 1140 | GW | 4 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-11-32-34 | 8/28/17 | 1315 | GW | 4 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-11-42-44 | 8/28/17 | 1450 | GW | 12 | ✓ | ✓ | ✓ | ✓ | | | | | | | MS/MSD | |
| SB-2017-DUP-04 | 8/28/17 | 1325 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-11-52-54 | 8/28/17 | 1625 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-12-62-64 | 8/29/17 | 935 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | [signature] | 1945 | 8-30-17 | | [signature] | 8-30-17 | 1445 |
| Additional Comments: | | | [signature] | 1800 | 8-30-17 | | [signature] | 8-31-17 | 0850 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐
On ICE ☐

Temperature 2.1, 2.1 C FR#7 0.1

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

680-142686 Chain of Custody

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 2 of: 3

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation: [signature]

Sampler(s) Signature(s): [signature]

Preservatives (see codes): N I I S S I O S

Analyses Requested

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-11-62-64 | 8/29/17 | 950 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-11-72-74 | 8/29/17 | 1110 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-01-22-24 | 8/29/17 | 1330 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-01-32-34 | 8/29/17 | 1545 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-12-72-74 | 8/29/17 | 1130 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-12-82-84 | 8/29/17 | 1400 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-12-92-94 | 8/29/17 | 1610 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-12-99-101 | 8/30/17 | 1010 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-01-42-44 | 8/30/17 | 910 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | [signature] | 8-30-17 | 1445 | | [signature] | 8-30-17 | 1445 |
| Additional Comments: | | | [signature] | 8-30-17 | 1800 | | [signature] | 08-31-17 | 0850 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal # _____

Preserve Where Applicable ☐
On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 3 of: 3

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affiliation: Kevin L. Anderson

Sampler(s) Signature(s):

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue, Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-01-52-54 | 8/30/17 | 1020 | GW | 12 | ✓ | ✓ | ✓ | ✓ | | | | | | MS/MSD | |
| SB-2017-01-62-64 | 8/30/17 | 1200 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-DUP-05 | 8/30/17 | 1210 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017- | | | GW | | | | | | | | | | | | |
| SB-2017- | | | GW | | | | | | | | | | | | |
| SB-2017- | | | GW | | | | | | | | | | | | |

Total Number of Containers

Shipping Details: courier pick up

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | Kevin Anderson | 8-30-17 | 1445 | | [illegible] | 8-30-17 | 1445 |
| Additional Comments: | | | [illegible] | 8-30-17 | 1800 | | [illegible] | 08-31-17 | 0850 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐
On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

# Login Sample Receipt Checklist

Client: KOMAN Government Solutions, LLC

Job Number: 680-142686-1

**Login Number: 142686**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: Ragnaldsen, Amy E**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: KOMAN Government Solutions, LLC

Job Number: 680-142686-1

**Login Number: 142686**
**List Number: 2**
**Creator: Pottruff, Reed W**

**List Source: TestAmerica Denver**
**List Creation: 08/31/17 10:34 AM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| | AFCEE | | SAVLAB | |
| Alabama | State Program | 4 | 41450 | 06-30-18 |
| Alaska | State Program | 10 | | 06-30-18 |
| Alaska (UST) | State Program | 10 | UST-104 | 11-05-17 * |
| Arizona | State Program | 9 | AZ808 | 12-14-17 |
| Arkansas DEQ | State Program | 6 | 88-0692 | 02-01-18 |
| California | State Program | 9 | 2939 | 06-30-17 * |
| Colorado | State Program | 8 | N/A | 12-31-17 |
| Connecticut | State Program | 1 | PH-0161 | 03-31-19 |
| Florida | NELAP | 4 | E87052 | 06-30-18 |
| GA Dept. of Agriculture | State Program | 4 | N/A | 06-12-18 |
| Georgia | State Program | 4 | 803 | 06-30-18 |
| Guam | State Program | 9 | 15-005r | 04-16-18 |
| Hawaii | State Program | 9 | N/A | 06-30-18 |
| Illinois | NELAP | 5 | 200022 | 11-30-17 |
| Indiana | State Program | 5 | N/A | 06-30-18 |
| Iowa | State Program | 7 | 353 | 06-30-19 |
| Kentucky (DW) | State Program | 4 | 90084 | 12-31-17 |
| Kentucky (UST) | State Program | 4 | 18 | 06-30-18 |
| Kentucky (WW) | State Program | 4 | 90084 | 12-31-17 |
| L-A-B | DoD ELAP | | L2463 | 09-22-19 |
| L-A-B | ISO/IEC 17025 | | L2463.01 | 09-22-19 |
| Louisiana | NELAP | 6 | 30690 | 06-30-18 |
| Louisiana (DW) | NELAP | 6 | LA160019 | 12-31-17 |
| Maine | State Program | 1 | GA00006 | 09-24-18 |
| Maryland | State Program | 3 | 250 | 12-31-17 |
| Massachusetts | State Program | 1 | M-GA006 | 06-30-18 |
| Michigan | State Program | 5 | 9925 | 06-30-17 * |
| Mississippi | State Program | 4 | N/A | 06-30-18 |
| Nebraska | State Program | 7 | TestAmerica-Savannah | 06-30-18 |
| New Jersey | NELAP | 2 | GA769 | 06-30-18 |
| New Mexico | State Program | 6 | N/A | 06-30-18 |
| New York | NELAP | 2 | 10842 | 03-31-18 |
| North Carolina (DW) | State Program | 4 | 13701 | 07-31-18 |
| North Carolina (WW/SW) | State Program | 4 | 269 | 12-31-17 |
| Oklahoma | State Program | 6 | 9984 | 08-31-18 |
| Pennsylvania | NELAP | 3 | 68-00474 | 06-30-18 |
| Puerto Rico | State Program | 2 | GA00006 | 12-31-17 |
| South Carolina | State Program | 4 | 98001 | 06-30-17 * |
| Tennessee | State Program | 4 | TN02961 | 06-30-18 |
| Texas | NELAP | 6 | T104704185-16-9 | 11-30-17 |
| Texas | State Program | 6 | T104704185 | 06-30-18 |
| US Fish & Wildlife | Federal | | LE058448-0 | 07-31-18 |
| USDA | Federal | | SAV 3-04 | 06-14-20 * |
| Virginia | NELAP | 3 | 460161 | 06-14-18 |
| Washington | State Program | 10 | C805 | 06-10-18 |
| West Virginia (DW) | State Program | 3 | 9950C | 12-31-17 |
| West Virginia DEP | State Program | 3 | 094 | 06-30-18 |
| Wisconsin | State Program | 5 | 999819810 | 08-31-17 * |
| Wyoming | State Program | 8 | 8TMS-L | 06-30-16 * |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142686-1

## Laboratory: TestAmerica Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

TestAmerica Job ID: 680-142774-1
Client Project/Site: Devens - SHL EPA SOW Phase 1

For:
KOMAN Government Solutions, LLC
293 Boston Post Road
Suite 100
Marlborough, Massachusetts 01752

Attn: Laurie Ekes

*Authorized for release by:*
*9/19/2017 10:58:02 AM*

Jerry Lanier, Project Manager I
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LINKS

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*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Job ID: 680-142774-1

**Laboratory: TestAmerica Savannah**

**Narrative**

# CASE NARRATIVE

## Client: KOMAN Government Solutions, LLC

## Project: Devens - SHL EPA SOW Phase 1

## Report Number: 680-142774-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**

The samples were received on 09/02/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.3º C and 2.1º C.

**METALS (ICP) - DISSOLVED**

Samples SB-2017-06-55-57A (680-142774-1), SB-2017-03-22-24 (680-142774-2), SB-2017-03-32-34 (680-142774-3), SB-2017-03-42-44 (680-142774-4), SB-2017-03-52-54 (680-142774-5), SB-2017-03-62-44 (680-142774-6), SB-2017-0-DUP-06 (680-142774-7), SB-2017-04-32-34 (680-142774-8), SB-2017-04-42-44 (680-142774-9), SB-2017-04-22-24 (680-142774-10), SB-2017-01-92-94 (680-142774-11), SB-2017-01-72-74 (680-142774-12), SB-2017-01-82-84 (680-142774-13) and SB-2017-01-98-100 (680-142774-14) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/05/2017 and 09/06/2017 and analyzed on 09/07/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**

Samples SB-2017-06-55-57A (680-142774-1), SB-2017-03-22-24 (680-142774-2), SB-2017-03-32-34 (680-142774-3), SB-2017-03-42-44 (680-142774-4), SB-2017-03-52-54 (680-142774-5), SB-2017-03-62-44 (680-142774-6), SB-2017-0-DUP-06 (680-142774-7), SB-2017-04-32-34 (680-142774-8), SB-2017-04-42-44 (680-142774-9), SB-2017-04-22-24 (680-142774-10), SB-2017-01-92-94 (680-142774-11), SB-2017-01-72-74 (680-142774-12), SB-2017-01-82-84 (680-142774-13) and SB-2017-01-98-100 (680-142774-14) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 09/05/2017 and 09/06/2017 and analyzed on 09/07/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**

Samples SB-2017-06-55-57A (680-142774-1), SB-2017-03-22-24 (680-142774-2), SB-2017-03-32-34 (680-142774-3), SB-2017-03-42-44 (680-142774-4), SB-2017-03-52-54 (680-142774-5), SB-2017-03-62-44 (680-142774-6), SB-2017-0-DUP-06 (680-142774-7), SB-2017-04-32-34 (680-142774-8), SB-2017-04-42-44 (680-142774-9), SB-2017-04-22-24 (680-142774-10), SB-2017-01-92-94 (680-142774-11), SB-2017-01-72-74 (680-142774-12), SB-2017-01-82-84 (680-142774-13) and SB-2017-01-98-100 (680-142774-14) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 09/06/2017.

Alkalinity was detected in method blank MB 280-386754/31 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Alkalinity was detected in method blank MB 280-386754/5 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Job ID: 680-142774-1 (Continued)

### Laboratory: TestAmerica Savannah (Continued)

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**

Samples SB-2017-06-55-57A (680-142774-1), SB-2017-03-22-24 (680-142774-2), SB-2017-03-32-34 (680-142774-3), SB-2017-03-42-44 (680-142774-4), SB-2017-03-52-54 (680-142774-5), SB-2017-03-62-44 (680-142774-6), SB-2017-0-DUP-06 (680-142774-7), SB-2017-04-32-34 (680-142774-8), SB-2017-04-42-44 (680-142774-9), SB-2017-04-22-24 (680-142774-10), SB-2017-01-92-94 (680-142774-11), SB-2017-01-72-74 (680-142774-12), SB-2017-01-82-84 (680-142774-13) and SB-2017-01-98-100 (680-142774-14) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 09/13/2017 and 09/14/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**DISSOLVED ORGANIC CARBON**

Samples SB-2017-06-55-57A (680-142774-1), SB-2017-03-22-24 (680-142774-2), SB-2017-03-32-34 (680-142774-3), SB-2017-03-42-44 (680-142774-4), SB-2017-03-52-54 (680-142774-5), SB-2017-03-62-44 (680-142774-6), SB-2017-0-DUP-06 (680-142774-7), SB-2017-04-32-34 (680-142774-8), SB-2017-04-42-44 (680-142774-9), SB-2017-04-22-24 (680-142774-10), SB-2017-01-92-94 (680-142774-11), SB-2017-01-72-74 (680-142774-12), SB-2017-01-82-84 (680-142774-13) and SB-2017-01-98-100 (680-142774-14) were analyzed for dissolved organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 09/06/2017.

Dissolved Organic Carbon - Duplicate was detected in method blank MB 280-386688/35 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 680-142774-1 | SB-2017-06-55-57A | Water | 08/31/17 11:30 | 09/02/17 09:57 |
| 680-142774-2 | SB-2017-03-22-24 | Water | 08/31/17 15:10 | 09/02/17 09:57 |
| 680-142774-3 | SB-2017-03-32-34 | Water | 08/31/17 16:25 | 09/02/17 09:57 |
| 680-142774-4 | SB-2017-03-42-44 | Water | 09/01/17 09:30 | 09/02/17 09:57 |
| 680-142774-5 | SB-2017-03-52-54 | Water | 09/01/17 11:20 | 09/02/17 09:57 |
| 680-142774-6 | SB-2017-03-62-44 | Water | 09/01/17 12:50 | 09/02/17 09:57 |
| 680-142774-7 | SB-2017-0-DUP-06 | Water | 09/01/17 12:55 | 09/02/17 09:57 |
| 680-142774-8 | SB-2017-04-32-34 | Water | 09/01/17 09:25 | 09/02/17 09:57 |
| 680-142774-9 | SB-2017-04-42-44 | Water | 09/01/17 11:40 | 09/02/17 09:57 |
| 680-142774-10 | SB-2017-04-22-24 | Water | 08/31/17 15:25 | 09/02/17 09:57 |
| 680-142774-11 | SB-2017-01-92-94 | Water | 08/31/17 09:45 | 09/02/17 09:57 |
| 680-142774-12 | SB-2017-01-72-74 | Water | 08/31/17 13:45 | 09/02/17 09:57 |
| 680-142774-13 | SB-2017-01-82-84 | Water | 08/30/17 16:30 | 09/02/17 09:57 |
| 680-142774-14 | SB-2017-01-98-100 | Water | 08/31/17 12:00 | 09/02/17 09:57 |

# Method Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060 | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Client Sample ID: SB-2017-06-55-57A — Lab Sample ID: 680-142774-1

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.3 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 4.9 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 39 | J | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 100 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 3.6 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 42 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.3 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-03-22-24 — Lab Sample ID: 680-142774-2

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.7 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 3.7 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 24 | J | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 24 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Alkalinity | 37 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.1 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-03-32-34 — Lab Sample ID: 680-142774-3

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 14 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 840 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 36 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 9.3 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 40 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.9 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-03-42-44 — Lab Sample ID: 680-142774-4

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 37 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 8.4 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 5200 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 300 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 1.7 | J | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 41 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 3.7 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-03-52-54 — Lab Sample ID: 680-142774-5

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 3.7 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 8200 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 390 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Client Sample ID: SB-2017-03-52-54 (Continued) — Lab Sample ID: 680-142774-5

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 5.8 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 53 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 4.1 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-03-62-44 — Lab Sample ID: 680-142774-6

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 3.3 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 8300 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 560 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 13 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 63 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 3.1 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-0-DUP-06 — Lab Sample ID: 680-142774-7

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 3.3 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 8200 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 550 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 14 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 63 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 3.0 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-04-32-34 — Lab Sample ID: 680-142774-8

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.1 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 2.8 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Manganese | 26 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 2.7 | J | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 30 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.5 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-04-42-44 — Lab Sample ID: 680-142774-9

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 11 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 1.6 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 3200 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 390 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Alkalinity | 36 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 0.92 | J | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Client Sample ID: SB-2017-04-22-24 — Lab Sample ID: 680-142774-10

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.7 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 3.4 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 43 | J | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 25 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 1.9 | J | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 9.9 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.0 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-01-92-94 — Lab Sample ID: 680-142774-11

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 11 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 6.3 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 26000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 7700 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 2100 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 280 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.6 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-01-72-74 — Lab Sample ID: 680-142774-12

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 6.7 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 13000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 730 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 26 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 63 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.5 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-01-82-84 — Lab Sample ID: 680-142774-13

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 10 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 55000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 2600 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 280 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 220 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 6.5 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-01-98-100 — Lab Sample ID: 680-142774-14

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 11 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 6.1 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 37000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Client Sample ID: SB-2017-01-98-100 (Continued) — Lab Sample ID: 680-142774-14

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Manganese | 7100 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 3100 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 270 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 4.4 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

This Detection Summary does not include radiochemical test results.

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Client Sample ID: SB-2017-06-55-57A

**Lab Sample ID: 680-142774-1**

**Date Collected: 08/31/17 11:30**
**Matrix: Water**
**Date Received: 09/02/17 09:57**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.3 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/13/17 20:40 | 1 |
| Sulfate | 4.9 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/13/17 20:40 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 39 | J | 50 | 50 | 17 | ug/L | | 09/07/17 14:23 | 1 |
| Manganese | 100 | | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 14:23 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.6 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 04:57 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 42 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 14:27 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.3 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/06/17 01:25 | 1 |

## Client Sample ID: SB-2017-03-22-24

**Lab Sample ID: 680-142774-2**

**Date Collected: 08/31/17 15:10**
**Matrix: Water**
**Date Received: 09/02/17 09:57**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.7 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/13/17 20:57 | 1 |
| Sulfate | 3.7 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/13/17 20:57 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 24 | J | 50 | 50 | 17 | ug/L | | 09/07/17 14:28 | 1 |
| Manganese | 24 | | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 14:28 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 05:10 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 37 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 14:22 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.1 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/06/17 01:42 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Client Sample ID: SB-2017-03-32-34

**Lab Sample ID: 680-142774-3**

**Date Collected: 08/31/17 16:25**
**Matrix: Water**
**Date Received: 09/02/17 09:57**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/13/17 21:14 | 1 |
| Sulfate | 14 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/13/17 21:14 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 840 | | 50 | 50 | 17 | ug/L | | 09/07/17 14:08 | 1 |
| Manganese | 36 | | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 14:08 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 9.3 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 04:53 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 40 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 14:38 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.9 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/06/17 02:35 | 1 |

## Client Sample ID: SB-2017-03-42-44

**Lab Sample ID: 680-142774-4**

**Date Collected: 09/01/17 09:30**
**Matrix: Water**
**Date Received: 09/02/17 09:57**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 37 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/13/17 21:32 | 1 |
| Sulfate | 8.4 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/13/17 21:32 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 5200 | | 50 | 50 | 17 | ug/L | | 09/07/17 13:39 | 1 |
| Manganese | 300 | | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 13:39 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.7 | J | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 04:27 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 41 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 14:32 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.7 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/06/17 02:53 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Client Sample ID: SB-2017-03-52-54

**Lab Sample ID: 680-142774-5**

**Date Collected: 09/01/17 11:20**
**Matrix: Water**
**Date Received: 09/02/17 09:57**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/13/17 22:41 | 1 |
| Sulfate | 3.7 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/13/17 22:41 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 8200 | | 50 | 50 | 17 | ug/L | | 09/07/17 20:38 | 1 |
| Manganese | 390 | | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 20:38 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 5.8 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 19:18 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 53 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 13:26 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 4.1 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/06/17 03:13 | 1 |

## Client Sample ID: SB-2017-03-62-44

**Lab Sample ID: 680-142774-6**

**Date Collected: 09/01/17 12:50**
**Matrix: Water**
**Date Received: 09/02/17 09:57**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/13/17 23:34 | 1 |
| Sulfate | 3.3 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/13/17 23:34 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 8300 | | 50 | 50 | 17 | ug/L | | 09/07/17 14:42 | 1 |
| Manganese | 560 | | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 14:42 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 13 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 05:23 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 63 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 13:21 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.1 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/06/17 03:29 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Client Sample ID: SB-2017-0-DUP-06

**Lab Sample ID: 680-142774-7**

**Date Collected: 09/01/17 12:55**
**Matrix: Water**
**Date Received: 09/02/17 09:57**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/13/17 23:51 | 1 |
| Sulfate | 3.3 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/13/17 23:51 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 8200 | | 50 | 50 | 17 | ug/L | | 09/07/17 14:38 | 1 |
| Manganese | 550 | | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 14:38 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 14 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 05:19 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 63 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 13:36 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.0 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/06/17 03:44 | 1 |

## Client Sample ID: SB-2017-04-32-34

**Lab Sample ID: 680-142774-8**

**Date Collected: 09/01/17 09:25**
**Matrix: Water**
**Date Received: 09/02/17 09:57**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.1 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 00:08 | 1 |
| Sulfate | 2.8 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 00:08 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 09/07/17 14:04 | 1 |
| Manganese | 26 | | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 14:04 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2.7 | J | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 04:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 30 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 13:31 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.5 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/06/17 04:03 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Client Sample ID: SB-2017-04-42-44

**Lab Sample ID: 680-142774-9**

**Date Collected: 09/01/17 11:40**
**Matrix: Water**
**Date Received: 09/02/17 09:57**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 11 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 00:26 | 1 |
| Sulfate | 1.6 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 00:26 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 3200 | | 50 | 50 | 17 | ug/L | | 09/07/17 14:33 | 1 |
| Manganese | 390 | | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 14:33 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 05:15 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 36 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 13:05 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.92 | J | 1.0 | 0.50 | 0.16 | mg/L | | 09/06/17 04:19 | 1 |

## Client Sample ID: SB-2017-04-22-24

**Lab Sample ID: 680-142774-10**

**Date Collected: 08/31/17 15:25**
**Matrix: Water**
**Date Received: 09/02/17 09:57**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.7 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 00:43 | 1 |
| Sulfate | 3.4 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 00:43 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 43 | J | 50 | 50 | 17 | ug/L | | 09/07/17 15:07 | 1 |
| Manganese | 25 | | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 15:07 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.9 | J | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 05:45 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 9.9 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 14:06 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.0 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/06/17 04:38 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Client Sample ID: SB-2017-01-92-94

**Lab Sample ID: 680-142774-11**

**Date Collected: 08/31/17 09:45**
**Matrix: Water**
**Date Received: 09/02/17 09:57**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 11 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 01:01 | 1 |
| Sulfate | 6.3 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 01:01 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 26000 | | 50 | 50 | 17 | ug/L | | 09/07/17 15:02 | 1 |
| Manganese | 7700 | | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 15:02 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2100 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 05:41 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 280 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 14:17 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.6 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/06/17 04:57 | 1 |

## Client Sample ID: SB-2017-01-72-74

**Lab Sample ID: 680-142774-12**

**Date Collected: 08/31/17 13:45**
**Matrix: Water**
**Date Received: 09/02/17 09:57**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 02:10 | 1 |
| Sulfate | 6.7 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 02:10 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 13000 | | 50 | 50 | 17 | ug/L | | 09/07/17 14:47 | 1 |
| Manganese | 730 | | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 14:47 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 26 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 05:28 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 63 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 12:59 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.5 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/06/17 05:13 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Client Sample ID: SB-2017-01-82-84

**Lab Sample ID: 680-142774-13**

**Date Collected: 08/30/17 16:30**
**Matrix: Water**
**Date Received: 09/02/17 09:57**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 02:28 | 1 |
| Sulfate | 10 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 02:28 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 55000 | | 50 | 50 | 17 | ug/L | | 09/07/17 14:52 | 1 |
| Manganese | 2600 | | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 14:52 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 280 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 05:32 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 220 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 13:11 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 6.5 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/06/17 06:07 | 1 |

## Client Sample ID: SB-2017-01-98-100

**Lab Sample ID: 680-142774-14**

**Date Collected: 08/31/17 12:00**
**Matrix: Water**
**Date Received: 09/02/17 09:57**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 11 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/14/17 02:45 | 1 |
| Sulfate | 6.1 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/14/17 02:45 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 37000 | | 50 | 50 | 17 | ug/L | | 09/07/17 14:57 | 1 |
| Manganese | 7100 | | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 14:57 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3100 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 05:36 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 270 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 13:16 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 4.4 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/06/17 06:21 | 1 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-494622/1008** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494622**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 09/13/17 18:03 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 09/13/17 18:03 | 1 |

**Lab Sample ID: LCS 680-494622/1009** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494622**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.87 | | mg/L | | 99 | 87 - 111 |
| Sulfate | 10.0 | 9.88 | | mg/L | | 99 | 87 - 112 |

**Lab Sample ID: LCSD 680-494622/10** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494622**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.92 | | mg/L | | 99 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 9.80 | | mg/L | | 98 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-142774-5 MS** — **Client Sample ID: SB-2017-03-52-54**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494622**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | | 10.0 | 24.4 | | mg/L | | 106 | 87 - 111 |
| Sulfate | 3.7 | M | 10.0 | 14.0 | M | mg/L | | 103 | 87 - 112 |

**Lab Sample ID: 680-142774-5 MSD** — **Client Sample ID: SB-2017-03-52-54**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494622**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | | 10.0 | 24.7 | | mg/L | | 109 | 87 - 111 | 1 | 15 |
| Sulfate | 3.7 | M | 10.0 | 14.3 | M | mg/L | | 106 | 87 - 112 | 2 | 15 |

**Lab Sample ID: 680-142774-4 DU** — **Client Sample ID: SB-2017-03-42-44**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494622**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Chloride | 37 | | 37.2 | | mg/L | | 0.09 | 15 |
| Sulfate | 8.4 | M | 8.36 | M | mg/L | | 0 | 15 |

**Lab Sample ID: 680-142774-11 DU** — **Client Sample ID: SB-2017-01-92-94**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494622**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Chloride | 11 | | 11.4 | | mg/L | | 0.2 | 15 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: 680-142774-11 DU** — **Client Sample ID: SB-2017-01-92-94**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494622**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 6.3 | M | | 6.25 | M | mg/L | | | | 0.4 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-494110/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494496** — **Prep Batch: 494110**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 09/07/17 13:30 | 1 |
| Manganese | 3.0 | U | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 13:30 | 1 |

**Lab Sample ID: LCS 680-494110/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494496** — **Prep Batch: 494110**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 5120 | | ug/L | | 102 | 87 - 115 |
| Manganese | 500 | 540 | | ug/L | | 108 | 90 - 114 |

**Lab Sample ID: MB 680-494237/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494496** — **Prep Batch: 494237**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 09/07/17 20:01 | 1 |
| Manganese | 3.0 | U | 10 | 3.0 | 1.0 | ug/L | | 09/07/17 20:01 | 1 |

**Lab Sample ID: LCS 680-494237/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494496** — **Prep Batch: 494237**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4890 | | ug/L | | 98 | 87 - 115 |
| Manganese | 500 | 529 | | ug/L | | 106 | 90 - 114 |

**Lab Sample ID: 680-142774-4 MS** — **Client Sample ID: SB-2017-03-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 494496** — **Prep Batch: 494110**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 5200 | | 5000 | 10200 | | ug/L | | 100 | 87 - 115 |
| Manganese | 300 | | 500 | 832 | | ug/L | | 107 | 90 - 114 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 680-142774-4 MSD** — **Client Sample ID: SB-2017-03-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 494496** — **Prep Batch: 494110**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 5200 | | 5000 | 9850 | | ug/L | | 93 | 87 - 115 | 3 | 20 |
| Manganese | 300 | | 500 | 796 | | ug/L | | 100 | 90 - 114 | 4 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-494108/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494377** — **Prep Batch: 494108**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 04:18 | 1 |

**Lab Sample ID: LCS 680-494108/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494377** — **Prep Batch: 494108**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 105 | | ug/L | | 105 | 84 - 116 |

**Lab Sample ID: MB 680-494236/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494492** — **Prep Batch: 494236**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/07/17 18:18 | 1 |

**Lab Sample ID: LCS 680-494236/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 494492** — **Prep Batch: 494236**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 101 | | ug/L | | 101 | 84 - 116 |

**Lab Sample ID: 680-142774-4 MS** — **Client Sample ID: SB-2017-03-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 494377** — **Prep Batch: 494108**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.7 | J | 100 | 105 | | ug/L | | 103 | 84 - 116 |

**Lab Sample ID: 680-142774-4 MSD** — **Client Sample ID: SB-2017-03-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 494377** — **Prep Batch: 494108**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.7 | J | 100 | 98.5 | | ug/L | | 97 | 84 - 116 | 7 | 20 |

## Method: 9060 - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-386688/35** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 386688**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.224 | J | 1.0 | 0.50 | 0.16 | mg/L | | 09/05/17 21:41 | 1 |

**Lab Sample ID: LCS 280-386688/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 386688**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 25.0 | 23.4 | | mg/L | | 93 | 88 - 112 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-386754/31** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386754**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 2.87 | J | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 14:01 | 1 |

**Lab Sample ID: MB 280-386754/5** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386754**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.30 | J | 5.0 | 3.2 | 1.1 | mg/L | | 09/06/17 11:38 | 1 |

**Lab Sample ID: LCS 280-386754/30** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386754**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 202 | B | mg/L | | 101 | 90 - 110 |

**Lab Sample ID: LCS 280-386754/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386754**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 195 | B | mg/L | | 97 | 90 - 110 |

**Lab Sample ID: 680-142774-10 DU** — **Client Sample ID: SB-2017-04-22-24**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386754**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Alkalinity | 9.9 | B | 11.3 | | mg/L | | 13 | 10 |

# QC Association Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## HPLC/IC

### Analysis Batch: 494622

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142774-1 | SB-2017-06-55-57A | Total/NA | Water | 9056A | |
| 680-142774-2 | SB-2017-03-22-24 | Total/NA | Water | 9056A | |
| 680-142774-3 | SB-2017-03-32-34 | Total/NA | Water | 9056A | |
| 680-142774-4 | SB-2017-03-42-44 | Total/NA | Water | 9056A | |
| 680-142774-5 | SB-2017-03-52-54 | Total/NA | Water | 9056A | |
| 680-142774-6 | SB-2017-03-62-44 | Total/NA | Water | 9056A | |
| 680-142774-7 | SB-2017-0-DUP-06 | Total/NA | Water | 9056A | |
| 680-142774-8 | SB-2017-04-32-34 | Total/NA | Water | 9056A | |
| 680-142774-9 | SB-2017-04-42-44 | Total/NA | Water | 9056A | |
| 680-142774-10 | SB-2017-04-22-24 | Total/NA | Water | 9056A | |
| 680-142774-11 | SB-2017-01-92-94 | Total/NA | Water | 9056A | |
| 680-142774-12 | SB-2017-01-72-74 | Total/NA | Water | 9056A | |
| 680-142774-13 | SB-2017-01-82-84 | Total/NA | Water | 9056A | |
| 680-142774-14 | SB-2017-01-98-100 | Total/NA | Water | 9056A | |
| MB 680-494622/1008 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-494622/1009 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-494622/10 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-142774-5 MS | SB-2017-03-52-54 | Total/NA | Water | 9056A | |
| 680-142774-5 MSD | SB-2017-03-52-54 | Total/NA | Water | 9056A | |
| 680-142774-4 DU | SB-2017-03-42-44 | Total/NA | Water | 9056A | |
| 680-142774-11 DU | SB-2017-01-92-94 | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 494108

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142774-1 | SB-2017-06-55-57A | Dissolved | Water | 3005A | |
| 680-142774-2 | SB-2017-03-22-24 | Dissolved | Water | 3005A | |
| 680-142774-3 | SB-2017-03-32-34 | Dissolved | Water | 3005A | |
| 680-142774-4 | SB-2017-03-42-44 | Dissolved | Water | 3005A | |
| 680-142774-6 | SB-2017-03-62-44 | Dissolved | Water | 3005A | |
| 680-142774-7 | SB-2017-0-DUP-06 | Dissolved | Water | 3005A | |
| 680-142774-8 | SB-2017-04-32-34 | Dissolved | Water | 3005A | |
| 680-142774-9 | SB-2017-04-42-44 | Dissolved | Water | 3005A | |
| 680-142774-10 | SB-2017-04-22-24 | Dissolved | Water | 3005A | |
| 680-142774-11 | SB-2017-01-92-94 | Dissolved | Water | 3005A | |
| 680-142774-12 | SB-2017-01-72-74 | Dissolved | Water | 3005A | |
| 680-142774-13 | SB-2017-01-82-84 | Dissolved | Water | 3005A | |
| 680-142774-14 | SB-2017-01-98-100 | Dissolved | Water | 3005A | |
| MB 680-494108/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-494108/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-142774-4 MS | SB-2017-03-42-44 | Dissolved | Water | 3005A | |
| 680-142774-4 MSD | SB-2017-03-42-44 | Dissolved | Water | 3005A | |

### Prep Batch: 494110

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142774-1 | SB-2017-06-55-57A | Dissolved | Water | 3005A | |
| 680-142774-2 | SB-2017-03-22-24 | Dissolved | Water | 3005A | |
| 680-142774-3 | SB-2017-03-32-34 | Dissolved | Water | 3005A | |
| 680-142774-4 | SB-2017-03-42-44 | Dissolved | Water | 3005A | |

## Metals (Continued)

### Prep Batch: 494110 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142774-6 | SB-2017-03-62-44 | Dissolved | Water | 3005A | |
| 680-142774-7 | SB-2017-0-DUP-06 | Dissolved | Water | 3005A | |
| 680-142774-8 | SB-2017-04-32-34 | Dissolved | Water | 3005A | |
| 680-142774-9 | SB-2017-04-42-44 | Dissolved | Water | 3005A | |
| 680-142774-10 | SB-2017-04-22-24 | Dissolved | Water | 3005A | |
| 680-142774-11 | SB-2017-01-92-94 | Dissolved | Water | 3005A | |
| 680-142774-12 | SB-2017-01-72-74 | Dissolved | Water | 3005A | |
| 680-142774-13 | SB-2017-01-82-84 | Dissolved | Water | 3005A | |
| 680-142774-14 | SB-2017-01-98-100 | Dissolved | Water | 3005A | |
| MB 680-494110/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-494110/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-142774-4 MS | SB-2017-03-42-44 | Dissolved | Water | 3005A | |
| 680-142774-4 MSD | SB-2017-03-42-44 | Dissolved | Water | 3005A | |

### Prep Batch: 494236

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142774-5 | SB-2017-03-52-54 | Dissolved | Water | 3005A | |
| MB 680-494236/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-494236/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 494237

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142774-5 | SB-2017-03-52-54 | Dissolved | Water | 3005A | |
| MB 680-494237/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-494237/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Analysis Batch: 494377

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142774-1 | SB-2017-06-55-57A | Dissolved | Water | 6020A | 494108 |
| 680-142774-2 | SB-2017-03-22-24 | Dissolved | Water | 6020A | 494108 |
| 680-142774-3 | SB-2017-03-32-34 | Dissolved | Water | 6020A | 494108 |
| 680-142774-4 | SB-2017-03-42-44 | Dissolved | Water | 6020A | 494108 |
| 680-142774-6 | SB-2017-03-62-44 | Dissolved | Water | 6020A | 494108 |
| 680-142774-7 | SB-2017-0-DUP-06 | Dissolved | Water | 6020A | 494108 |
| 680-142774-8 | SB-2017-04-32-34 | Dissolved | Water | 6020A | 494108 |
| 680-142774-9 | SB-2017-04-42-44 | Dissolved | Water | 6020A | 494108 |
| 680-142774-10 | SB-2017-04-22-24 | Dissolved | Water | 6020A | 494108 |
| 680-142774-11 | SB-2017-01-92-94 | Dissolved | Water | 6020A | 494108 |
| 680-142774-12 | SB-2017-01-72-74 | Dissolved | Water | 6020A | 494108 |
| 680-142774-13 | SB-2017-01-82-84 | Dissolved | Water | 6020A | 494108 |
| 680-142774-14 | SB-2017-01-98-100 | Dissolved | Water | 6020A | 494108 |
| MB 680-494108/1-A | Method Blank | Total Recoverable | Water | 6020A | 494108 |
| LCS 680-494108/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 494108 |
| 680-142774-4 MS | SB-2017-03-42-44 | Dissolved | Water | 6020A | 494108 |
| 680-142774-4 MSD | SB-2017-03-42-44 | Dissolved | Water | 6020A | 494108 |

### Analysis Batch: 494492

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142774-5 | SB-2017-03-52-54 | Dissolved | Water | 6020A | 494236 |
| MB 680-494236/1-A | Method Blank | Total Recoverable | Water | 6020A | 494236 |
| LCS 680-494236/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 494236 |

# QC Association Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

### Analysis Batch: 494496

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142774-1 | SB-2017-06-55-57A | Dissolved | Water | 6010C | 494110 |
| 680-142774-2 | SB-2017-03-22-24 | Dissolved | Water | 6010C | 494110 |
| 680-142774-3 | SB-2017-03-32-34 | Dissolved | Water | 6010C | 494110 |
| 680-142774-4 | SB-2017-03-42-44 | Dissolved | Water | 6010C | 494110 |
| 680-142774-5 | SB-2017-03-52-54 | Dissolved | Water | 6010C | 494237 |
| 680-142774-6 | SB-2017-03-62-44 | Dissolved | Water | 6010C | 494110 |
| 680-142774-7 | SB-2017-0-DUP-06 | Dissolved | Water | 6010C | 494110 |
| 680-142774-8 | SB-2017-04-32-34 | Dissolved | Water | 6010C | 494110 |
| 680-142774-9 | SB-2017-04-42-44 | Dissolved | Water | 6010C | 494110 |
| 680-142774-10 | SB-2017-04-22-24 | Dissolved | Water | 6010C | 494110 |
| 680-142774-11 | SB-2017-01-92-94 | Dissolved | Water | 6010C | 494110 |
| 680-142774-12 | SB-2017-01-72-74 | Dissolved | Water | 6010C | 494110 |
| 680-142774-13 | SB-2017-01-82-84 | Dissolved | Water | 6010C | 494110 |
| 680-142774-14 | SB-2017-01-98-100 | Dissolved | Water | 6010C | 494110 |
| MB 680-494110/1-A | Method Blank | Total Recoverable | Water | 6010C | 494110 |
| MB 680-494237/1-A | Method Blank | Total Recoverable | Water | 6010C | 494237 |
| LCS 680-494110/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 494110 |
| LCS 680-494237/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 494237 |
| 680-142774-4 MS | SB-2017-03-42-44 | Dissolved | Water | 6010C | 494110 |
| 680-142774-4 MSD | SB-2017-03-42-44 | Dissolved | Water | 6010C | 494110 |

## General Chemistry

### Analysis Batch: 386688

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142774-1 | SB-2017-06-55-57A | Dissolved | Water | 9060 | |
| 680-142774-2 | SB-2017-03-22-24 | Dissolved | Water | 9060 | |
| 680-142774-3 | SB-2017-03-32-34 | Dissolved | Water | 9060 | |
| 680-142774-4 | SB-2017-03-42-44 | Dissolved | Water | 9060 | |
| 680-142774-5 | SB-2017-03-52-54 | Dissolved | Water | 9060 | |
| 680-142774-6 | SB-2017-03-62-44 | Dissolved | Water | 9060 | |
| 680-142774-7 | SB-2017-0-DUP-06 | Dissolved | Water | 9060 | |
| 680-142774-8 | SB-2017-04-32-34 | Dissolved | Water | 9060 | |
| 680-142774-9 | SB-2017-04-42-44 | Dissolved | Water | 9060 | |
| 680-142774-10 | SB-2017-04-22-24 | Dissolved | Water | 9060 | |
| 680-142774-11 | SB-2017-01-92-94 | Dissolved | Water | 9060 | |
| 680-142774-12 | SB-2017-01-72-74 | Dissolved | Water | 9060 | |
| 680-142774-13 | SB-2017-01-82-84 | Dissolved | Water | 9060 | |
| 680-142774-14 | SB-2017-01-98-100 | Dissolved | Water | 9060 | |
| MB 280-386688/35 | Method Blank | Dissolved | Water | 9060 | |
| LCS 280-386688/34 | Lab Control Sample | Dissolved | Water | 9060 | |

### Analysis Batch: 386754

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142774-1 | SB-2017-06-55-57A | Total/NA | Water | SM 2320B | |
| 680-142774-2 | SB-2017-03-22-24 | Total/NA | Water | SM 2320B | |
| 680-142774-3 | SB-2017-03-32-34 | Total/NA | Water | SM 2320B | |
| 680-142774-4 | SB-2017-03-42-44 | Total/NA | Water | SM 2320B | |
| 680-142774-5 | SB-2017-03-52-54 | Total/NA | Water | SM 2320B | |
| 680-142774-6 | SB-2017-03-62-44 | Total/NA | Water | SM 2320B | |
| 680-142774-7 | SB-2017-0-DUP-06 | Total/NA | Water | SM 2320B | |
| 680-142774-8 | SB-2017-04-32-34 | Total/NA | Water | SM 2320B | |
| 680-142774-9 | SB-2017-04-42-44 | Total/NA | Water | SM 2320B | |

## General Chemistry (Continued)

### Analysis Batch: 386754 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142774-10 | SB-2017-04-22-24 | Total/NA | Water | SM 2320B | |
| 680-142774-11 | SB-2017-01-92-94 | Total/NA | Water | SM 2320B | |
| 680-142774-12 | SB-2017-01-72-74 | Total/NA | Water | SM 2320B | |
| 680-142774-13 | SB-2017-01-82-84 | Total/NA | Water | SM 2320B | |
| 680-142774-14 | SB-2017-01-98-100 | Total/NA | Water | SM 2320B | |
| MB 280-386754/31 | Method Blank | Total/NA | Water | SM 2320B | |
| MB 280-386754/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-386754/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| LCS 280-386754/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 680-142774-10 DU | SB-2017-04-22-24 | Total/NA | Water | SM 2320B | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Client Sample ID: SB-2017-06-55-57A

**Lab Sample ID: 680-142774-1**

**Date Collected: 08/31/17 11:30**

**Matrix: Water**

**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/13/17 20:40 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494110 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494496 | 09/07/17 14:23 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494108 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/07/17 04:57 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386688 | 09/06/17 01:25 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386754 | 09/06/17 14:27 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-03-22-24

**Lab Sample ID: 680-142774-2**

**Date Collected: 08/31/17 15:10**

**Matrix: Water**

**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/13/17 20:57 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494110 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494496 | 09/07/17 14:28 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494108 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/07/17 05:10 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386688 | 09/06/17 01:42 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386754 | 09/06/17 14:22 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-03-32-34

**Lab Sample ID: 680-142774-3**

**Date Collected: 08/31/17 16:25**

**Matrix: Water**

**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/13/17 21:14 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494110 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494496 | 09/07/17 14:08 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494108 | 09/05/17 16:42 | AJR | TAL SAV |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Client Sample ID: SB-2017-03-32-34

**Lab Sample ID: 680-142774-3**

**Date Collected: 08/31/17 16:25**

**Matrix: Water**

**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/07/17 04:53 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386688 | 09/06/17 02:35 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386754 | 09/06/17 14:38 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-03-42-44

**Lab Sample ID: 680-142774-4**

**Date Collected: 09/01/17 09:30**

**Matrix: Water**

**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/13/17 21:32 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494110 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494496 | 09/07/17 13:39 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494108 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/07/17 04:27 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386688 | 09/06/17 02:53 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386754 | 09/06/17 14:32 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-03-52-54

**Lab Sample ID: 680-142774-5**

**Date Collected: 09/01/17 11:20**

**Matrix: Water**

**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/13/17 22:41 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494237 | 09/06/17 13:38 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494496 | 09/07/17 20:38 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494236 | 09/06/17 13:38 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494492 | 09/07/17 19:18 | BJB | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386688 | 09/06/17 03:13 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386754 | 09/06/17 13:26 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-03-62-44

**Lab Sample ID: 680-142774-6**

**Date Collected: 09/01/17 12:50**

**Matrix: Water**

**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/13/17 23:34 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494110 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494496 | 09/07/17 14:42 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494108 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/07/17 05:23 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386688 | 09/06/17 03:29 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386754 | 09/06/17 13:21 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-0-DUP-06

**Lab Sample ID: 680-142774-7**

**Date Collected: 09/01/17 12:55**

**Matrix: Water**

**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/13/17 23:51 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494110 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494496 | 09/07/17 14:38 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494108 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/07/17 05:19 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386688 | 09/06/17 03:44 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386754 | 09/06/17 13:36 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-04-32-34

**Lab Sample ID: 680-142774-8**

**Date Collected: 09/01/17 09:25**

**Matrix: Water**

**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/14/17 00:08 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494110 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494496 | 09/07/17 14:04 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494108 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/07/17 04:49 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060 | | 1 | | | 386688 | 09/06/17 04:03 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386754 | 09/06/17 13:31 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-04-42-44 — Lab Sample ID: 680-142774-9

**Date Collected: 09/01/17 11:40** — **Matrix: Water**
**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/14/17 00:26 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494110 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494496 | 09/07/17 14:33 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494108 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/07/17 05:15 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386688 | 09/06/17 04:19 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386754 | 09/06/17 13:05 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-04-22-24 — Lab Sample ID: 680-142774-10

**Date Collected: 08/31/17 15:25** — **Matrix: Water**
**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/14/17 00:43 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494110 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494496 | 09/07/17 15:07 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494108 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/07/17 05:45 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386688 | 09/06/17 04:38 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386754 | 09/06/17 14:06 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-01-92-94 — Lab Sample ID: 680-142774-11

**Date Collected: 08/31/17 09:45** — **Matrix: Water**
**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/14/17 01:01 | UI | TAL SAV |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Client Sample ID: SB-2017-01-92-94 — Lab Sample ID: 680-142774-11

**Date Collected: 08/31/17 09:45** — **Matrix: Water**
**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/14/17 01:01 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494110 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494496 | 09/07/17 15:02 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494108 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/07/17 05:41 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386688 | 09/06/17 04:57 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386754 | 09/06/17 14:17 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-01-72-74 — Lab Sample ID: 680-142774-12

**Date Collected: 08/31/17 13:45** — **Matrix: Water**
**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/14/17 02:10 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494110 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494496 | 09/07/17 14:47 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494108 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/07/17 05:28 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386688 | 09/06/17 05:13 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386754 | 09/06/17 12:59 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-01-82-84 — Lab Sample ID: 680-142774-13

**Date Collected: 08/30/17 16:30** — **Matrix: Water**
**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/14/17 02:28 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494110 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494496 | 09/07/17 14:52 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494108 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/07/17 05:32 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060 | | 1 | | | 386688 | 09/06/17 06:07 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386754 | 09/06/17 13:11 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-01-98-100

## Lab Sample ID: 680-142774-14

**Date Collected: 08/31/17 12:00**

**Matrix: Water**

**Date Received: 09/02/17 09:57**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494622 | 09/14/17 02:45 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494110 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 494496 | 09/07/17 14:57 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494108 | 09/05/17 16:42 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 494377 | 09/07/17 05:36 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386688 | 09/06/17 06:21 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386754 | 09/06/17 13:16 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: of:

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation
[illegible]

Sampler(s) Signature(s)
[illegible]

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-06-55-57A | 8/31/17 | 1130 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-03-22-24 | 8/31/17 | 1510 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-03-32-34 | 8/31/17 | 1625 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-03-42-44 | 9/1/17 | 930 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-03-52-54 | 9/1/17 | 1120 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-03-62-64 | 9/1/17 | 1250 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-0DUP-06 | 9/1/17 | 1255 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-04-32-34 | 9/1/17 | 925 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| * SB-2017-04-~~42-45~~ 42-44 * | 9/1/17 | 1140 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | *Revised ID to: SB2017-04-42-44 per L. Ecco | |

680-142774 Chain of Custody

Shipping Details: courier pick up ← Total Number of Containers

Date Out: Via:
Returned: Via:
Additional Comments:
* = Dissolved Metals include: Fe, Mn (6010); As (6020)

| Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|
| | [illegible] | 9-1-17 | 1410 | | [illegible] | 9-1-17 | 1410 |
| | [illegible] | 9-1-17 | 1800 | | M Tyl | 9/2/17 | 951 |

email logins and results to:
lekes@komangs.com

**Lab Comments**
Seal #
Preserve Where Applicable ☐
On ICE ☐
Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

1.8°C (1F) 21



9/19/2017

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: ___ of: ___

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affiliation: Kerk Halberg KGS

Sampler(s) Signature(s): Kerk Halberg

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue, Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-04-22-24 | 8-31-17 | 1525 | GW | 4 | X | X | X | X | | |
| SB-2017-01-92-94 | 8-31-17 | 0945 | GW | 4 | X | X | X | X | | |
| SB-2017-01-72-74 | 8-31-17 | 1345 | GW | 4 | X | X | X | X | | |
| SB-2017-01-82-84 | 8-30-17 | 1630 | GW | 4 | X | X | X | X | | |
| SB-2017-01-98-100 | 8-31-17 | 1200 | GW | 4 | X | X | X | X | | |
| SB-2017- | | | GW | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Shipping Details: courier pick up

Date Out: Via:
Returned: Via:
Additional Comments:
* = Dissolved Metals include: Fe, Mn (6010); As (6020)

| Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|
| | Kerk Halberg KGS | 9-1-17 | 1210 | [signature] | 9-1-17 | 1210 |
| | [signature] | 9-1-17 | 1800 | [signature] | 9/2/17 | 951 |

← Total Number of Containers

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐
On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

1.8°C (w) 2.1°C

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: ___ of: ___

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation: Jack Arlson

Sampler(s) Signature(s):

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue, Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-06-55-57A | 8/31/17 | 1130 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-03-22-24 | 8/31/17 | 1510 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-03-32-34 | 8/31/17 | 1625 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-03-42-44 | 9/1/17 | 930 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-03-52-54 | 9/1/17 | 1120 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-03-62-64 | 9/1/17 | 1250 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-0DUP-06 | 9/1/17 | 1255 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-04-32-34 | 9/1/17 | 925 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-04-42-45 | 9/1/17 | 1140 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |

680-142774 Chain of Custody

Shipping Details: courier pick up

Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | Mark Wally | 9-1-17 | 1410 | | 9-1-17 | 1410 |
| Additional Comments: | | | | 9-1-17 | 1800 | | 9.2.17 | 0830 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:

lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐

On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | |
|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

1.3, +0.1, IR 7 transferred by AG 9.2.17

360325-Boston

360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: ___ of: ___

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affiliation: Kerk Halberg KGS

Sampler(s) Signature(s): Kerk Halberg

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue, Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017- 04-22-24 | 8-31-17 | 1525 | GW | 4 | X | X | X | X | | |
| SB-2017- 01-92-94 | 8-31-17 | 0945 | GW | 4 | X | X | X | X | | |
| SB-2017- 01-72-74 | 8-31-17 | 1345 | GW | 4 | X | X | X | X | | |
| SB-2017- 01-82-84 | 8-30-17 | 1630 | GW | 4 | X | X | X | X | | |
| SB-2017- 01-98-100 | 8-31-17 | 1200 | GW | 4 | X | X | X | X | | |
| SB-2017- | | | GW | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Shipping Details: courier pick up

← Total Number of Containers

| Date Out: Via: | Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|
| Returned: Via: | | Kerk Halberg KGS | 9-1-17 | 1210 | | 9-1-17 | 1210 |
| Additional Comments: | | | 9-1-17 | 1800 | | 9-2-17 | 0830 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:

lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐

On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

TRK# 0201 4258 8392 0981

SATURDAY 12:00P
PRIORITY OVERNIGHT

XO WHHA

80002
CO-US DEN

Part # 156148V-434 RIT2 02/17 **

# Login Sample Receipt Checklist

Client: KOMAN Government Solutions, LLC

Job Number: 680-142774-1

**Login Number: 142774**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: Ragnaldsen, Amy E**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | N/A | |
| Residual Chlorine Checked. | N/A | |

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| | AFCEE | | SAVLAB | |
| Alabama | State Program | 4 | 41450 | 06-30-18 |
| Alaska | State Program | 10 | | 06-30-18 |
| Alaska (UST) | State Program | 10 | UST-104 | 11-05-17 * |
| Arizona | State Program | 9 | AZ808 | 12-14-17 |
| Arkansas DEQ | State Program | 6 | 88-0692 | 02-01-18 |
| California | State Program | 9 | 2939 | 06-30-17 * |
| Colorado | State Program | 8 | N/A | 12-31-17 |
| Connecticut | State Program | 1 | PH-0161 | 03-31-19 |
| Florida | NELAP | 4 | E87052 | 06-30-18 |
| GA Dept. of Agriculture | State Program | 4 | N/A | 06-12-18 |
| Georgia | State Program | 4 | 803 | 06-30-18 |
| Guam | State Program | 9 | 15-005r | 04-16-18 |
| Hawaii | State Program | 9 | N/A | 06-30-18 |
| Illinois | NELAP | 5 | 200022 | 11-30-17 |
| Indiana | State Program | 5 | N/A | 06-30-18 |
| Iowa | State Program | 7 | 353 | 06-30-19 |
| Kentucky (DW) | State Program | 4 | 90084 | 12-31-17 |
| Kentucky (UST) | State Program | 4 | 18 | 06-30-18 |
| Kentucky (WW) | State Program | 4 | 90084 | 12-31-17 |
| L-A-B | DoD ELAP | | L2463 | 09-22-19 |
| L-A-B | ISO/IEC 17025 | | L2463.01 | 09-22-19 |
| Louisiana | NELAP | 6 | 30690 | 06-30-18 |
| Louisiana (DW) | NELAP | 6 | LA160019 | 12-31-17 |
| Maine | State Program | 1 | GA00006 | 09-24-18 |
| Maryland | State Program | 3 | 250 | 12-31-17 |
| Massachusetts | State Program | 1 | M-GA006 | 06-30-18 |
| Michigan | State Program | 5 | 9925 | 06-30-17 * |
| Mississippi | State Program | 4 | N/A | 06-30-18 |
| Nebraska | State Program | 7 | TestAmerica-Savannah | 06-30-18 |
| New Jersey | NELAP | 2 | GA769 | 06-30-18 |
| New Mexico | State Program | 6 | N/A | 06-30-18 |
| New York | NELAP | 2 | 10842 | 03-31-18 |
| North Carolina (DW) | State Program | 4 | 13701 | 07-31-18 |
| North Carolina (WW/SW) | State Program | 4 | 269 | 12-31-17 |
| Oklahoma | State Program | 6 | 9984 | 08-31-18 |
| Pennsylvania | NELAP | 3 | 68-00474 | 06-30-18 |
| Puerto Rico | State Program | 2 | GA00006 | 12-31-17 |
| South Carolina | State Program | 4 | 98001 | 06-30-17 * |
| Tennessee | State Program | 4 | TN02961 | 06-30-18 |
| Texas | NELAP | 6 | T104704185-16-9 | 11-30-17 |
| Texas | State Program | 6 | T104704185 | 06-30-18 |
| US Fish & Wildlife | Federal | | LE058448-0 | 07-31-18 |
| USDA | Federal | | SAV 3-04 | 06-14-20 * |
| Virginia | NELAP | 3 | 460161 | 06-14-18 |
| Washington | State Program | 10 | C805 | 06-10-18 |
| West Virginia (DW) | State Program | 3 | 9950C | 12-31-17 |
| West Virginia DEP | State Program | 3 | 094 | 06-30-18 |
| Wisconsin | State Program | 5 | 999819810 | 08-31-17 * |
| Wyoming | State Program | 8 | 8TMS-L | 06-30-16 * |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142774-1

## Laboratory: TestAmerica Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

TestAmerica Job ID: 680-142881-1
Client Project/Site: Devens - SHL EPA SOW Phase 1

For:
KOMAN Government Solutions, LLC
293 Boston Post Road
Suite 100
Marlborough, Massachusetts 01752

Attn: Laurie Ekes

*Authorized for release by:*
*9/20/2017 12:10:31 PM*

Jerry Lanier, Project Manager I
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jerry.lanier@testamericainc.com

LINKS

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Visit us at:
www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Job ID: 680-142881-1

**Laboratory: TestAmerica Savannah**

**Narrative**

# CASE NARRATIVE

## Client: KOMAN Government Solutions, LLC

## Project: Devens - SHL EPA SOW Phase 1

## Report Number: 680-142881-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 09/07/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.2º C and 0.5º C.

**METALS (ICP) - DISSOLVED**
Samples SB-2017-04-52-54 (680-142881-1), SB-2017-03-72-74 (680-142881-2), SB-2017-04-62-64 (680-142881-3), SB-2017-04-72-74 (680-142881-4), SB-2017-03-82-84 (680-142881-5), SB-2017-04-82-84 (680-142881-6), SB-2017-03-92-94 (680-142881-7), SB-2017-04-92-94 (680-142881-8), SB-2017-03-102-104 (680-142881-9), SB-2017-04-102-104 (680-142881-10), SB-2017-04-108-110 (680-142881-11), SB-2017-02-22-24 (680-142881-12) and FD-07 (680-142881-13) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/11/2017 and analyzed on 09/11/2017 and 09/12/2017.

The low level continuing calibration verification (CCVL) associated with batch 280-387315 recovered above the upper control limit for Mn. The sample associated with this CCVL were 10x greater than the reporting limit for the affected analytes and are verified by the higher CCV; therefore, the data have been reported.

field filtered/3005A/6010C_DOD5
Prep batch: 280-387058
SB-2017-04-72-74 (680-142881-4) and (CCVL 280-387315/54)

Iron failed the recovery criteria high for the MSD of sample SB-2017-04-52-54MSD (680-142881-1) in batch 280-387315. Iron exceeded the RPD limit.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples SB-2017-04-52-54 (680-142881-1), SB-2017-03-72-74 (680-142881-2), SB-2017-04-62-64 (680-142881-3), SB-2017-04-72-74 (680-142881-4), SB-2017-03-82-84 (680-142881-5), SB-2017-04-82-84 (680-142881-6), SB-2017-03-92-94 (680-142881-7), SB-2017-04-92-94 (680-142881-8), SB-2017-03-102-104 (680-142881-9), SB-2017-04-102-104 (680-142881-10), SB-2017-04-108-110 (680-142881-11), SB-2017-02-22-24 (680-142881-12) and FD-07 (680-142881-13) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 09/11/2017 and analyzed on 09/12/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples SB-2017-04-52-54 (680-142881-1), SB-2017-03-72-74 (680-142881-2), SB-2017-04-62-64 (680-142881-3), SB-2017-04-72-74

## Job ID: 680-142881-1 (Continued)

### Laboratory: TestAmerica Savannah (Continued)

(680-142881-4), SB-2017-03-82-84 (680-142881-5), SB-2017-04-82-84 (680-142881-6), SB-2017-03-92-94 (680-142881-7), SB-2017-04-92-94 (680-142881-8), SB-2017-03-102-104 (680-142881-9), SB-2017-04-102-104 (680-142881-10), SB-2017-04-108-110 (680-142881-11), SB-2017-02-22-24 (680-142881-12) and FD-07 (680-142881-13) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 09/08/2017 and 09/11/2017.

Alkalinity was detected in method blank MB 280-387016/31 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Alkalinity was detected in method blank MB 280-387016/5 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**9056 ANIONS**

Samples SB-2017-04-52-54 (680-142881-1), SB-2017-03-72-74 (680-142881-2), SB-2017-04-62-64 (680-142881-3), SB-2017-04-72-74 (680-142881-4), SB-2017-03-82-84 (680-142881-5), SB-2017-04-82-84 (680-142881-6), SB-2017-03-92-94 (680-142881-7), SB-2017-04-92-94 (680-142881-8), SB-2017-03-102-104 (680-142881-9), SB-2017-04-102-104 (680-142881-10), SB-2017-04-108-110 (680-142881-11), SB-2017-02-22-24 (680-142881-12) and FD-07 (680-142881-13) were analyzed for 9056 Anions in accordance with 9056. The samples were analyzed on 09/11/2017 and 09/12/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**DISSOLVED ORGANIC CARBON**

Samples SB-2017-04-52-54 (680-142881-1), SB-2017-03-72-74 (680-142881-2), SB-2017-04-62-64 (680-142881-3), SB-2017-04-72-74 (680-142881-4), SB-2017-03-82-84 (680-142881-5), SB-2017-04-82-84 (680-142881-6), SB-2017-03-92-94 (680-142881-7), SB-2017-04-92-94 (680-142881-8), SB-2017-03-102-104 (680-142881-9), SB-2017-04-102-104 (680-142881-10), SB-2017-04-108-110 (680-142881-11), SB-2017-02-22-24 (680-142881-12) and FD-07 (680-142881-13) were analyzed for dissolved organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 09/08/2017 and 09/09/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 680-142881-1 | SB-2017-04-52-54 | Water | 09/01/17 13:50 | 09/07/17 09:15 |
| 680-142881-2 | SB-2017-03-72-74 | Water | 09/01/17 14:40 | 09/07/17 09:15 |
| 680-142881-3 | SB-2017-04-62-64 | Water | 09/05/17 09:10 | 09/07/17 09:15 |
| 680-142881-4 | SB-2017-04-72-74 | Water | 09/05/17 11:40 | 09/07/17 09:15 |
| 680-142881-5 | SB-2017-03-82-84 | Water | 09/05/17 09:40 | 09/07/17 09:15 |
| 680-142881-6 | SB-2017-04-82-84 | Water | 09/05/17 13:20 | 09/07/17 09:15 |
| 680-142881-7 | SB-2017-03-92-94 | Water | 09/05/17 13:51 | 09/07/17 09:15 |
| 680-142881-8 | SB-2017-04-92-94 | Water | 09/05/17 16:25 | 09/07/17 09:15 |
| 680-142881-9 | SB-2017-03-102-104 | Water | 09/05/17 16:20 | 09/07/17 09:15 |
| 680-142881-10 | SB-2017-04-102-104 | Water | 09/06/17 09:45 | 09/07/17 09:15 |
| 680-142881-11 | SB-2017-04-108-110 | Water | 09/06/17 12:25 | 09/07/17 09:15 |
| 680-142881-12 | SB-2017-02-22-24 | Water | 09/06/17 15:00 | 09/07/17 09:15 |
| 680-142881-13 | FD-07 | Water | 09/06/17 09:50 | 09/07/17 09:15 |

# Method Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 6020A | Metals (ICP/MS) | SW846 | TAL DEN |
| 9056A | Anions, Ion Chromatography | SW846 | TAL DEN |
| 9060 | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

## Qualifiers

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| Q | One or more quality control criteria failed. |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

## Client Sample ID: SB-2017-04-52-54

**Lab Sample ID: 680-142881-1**

**Date Collected: 09/01/17 13:50**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 1600 | J | 100 | 85 | 22 | ug/L | | 09/11/17 22:23 | 1 |
| Manganese | 300 | J | 10 | 1.0 | 0.26 | ug/L | | 09/11/17 22:23 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.8 | J | 5.0 | 1.0 | 0.33 | ug/L | | 09/12/17 21:00 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 3.0 | | 3.0 | 0.50 | 0.25 | mg/L | | 09/11/17 19:32 | 1 |
| Sulfate | 3.6 | J M | 5.0 | 0.50 | 0.23 | mg/L | | 09/11/17 19:32 | 1 |
| Alkalinity | 45 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/08/17 10:18 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.6 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/08/17 23:28 | 1 |

## Client Sample ID: SB-2017-03-72-74

**Lab Sample ID: 680-142881-2**

**Date Collected: 09/01/17 14:40**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 21000 | | 100 | 85 | 22 | ug/L | | 09/11/17 22:35 | 1 |
| Manganese | 2100 | | 10 | 1.0 | 0.26 | ug/L | | 09/11/17 22:35 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 86 | | 5.0 | 1.0 | 0.33 | ug/L | | 09/12/17 21:19 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.7 | | 3.0 | 0.50 | 0.25 | mg/L | | 09/11/17 20:39 | 1 |
| Sulfate | 6.0 | | 5.0 | 0.50 | 0.23 | mg/L | | 09/11/17 20:39 | 1 |
| Alkalinity | 73 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/08/17 10:23 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.6 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/09/17 00:14 | 1 |

## Client Sample ID: SB-2017-04-62-64

**Lab Sample ID: 680-142881-3**

**Date Collected: 09/05/17 09:10**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 5400 | | 100 | 85 | 22 | ug/L | | 09/11/17 22:38 | 1 |
| Manganese | 320 | | 10 | 1.0 | 0.26 | ug/L | | 09/11/17 22:38 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

## Client Sample ID: SB-2017-04-62-64

**Lab Sample ID: 680-142881-3**
**Date Collected: 09/05/17 09:10**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 10 | | 5.0 | 1.0 | 0.33 | ug/L | | 09/12/17 21:23 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 16 | | 3.0 | 0.50 | 0.25 | mg/L | | 09/11/17 20:56 | 1 |
| Sulfate | 2.5 | J | 5.0 | 0.50 | 0.23 | mg/L | | 09/11/17 20:56 | 1 |
| Alkalinity | 57 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/08/17 10:01 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.2 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/09/17 00:31 | 1 |

## Client Sample ID: SB-2017-04-72-74

**Lab Sample ID: 680-142881-4**
**Date Collected: 09/05/17 11:40**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 18000 | | 100 | 85 | 22 | ug/L | | 09/11/17 22:50 | 1 |
| Manganese | 860 | Q | 10 | 1.0 | 0.26 | ug/L | | 09/11/17 22:50 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 38 | | 5.0 | 1.0 | 0.33 | ug/L | | 09/12/17 21:38 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 23 | | 3.0 | 0.50 | 0.25 | mg/L | | 09/11/17 21:46 | 1 |
| Sulfate | 6.6 | | 5.0 | 0.50 | 0.23 | mg/L | | 09/11/17 21:46 | 1 |
| Alkalinity | 48 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/08/17 09:09 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.3 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/09/17 00:47 | 1 |

## Client Sample ID: SB-2017-03-82-84

**Lab Sample ID: 680-142881-5**
**Date Collected: 09/05/17 09:40**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 46000 | | 100 | 85 | 22 | ug/L | | 09/11/17 22:53 | 1 |
| Manganese | 3800 | | 10 | 1.0 | 0.26 | ug/L | | 09/12/17 17:15 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 170 | | 5.0 | 1.0 | 0.33 | ug/L | | 09/12/17 21:42 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

## Client Sample ID: SB-2017-03-82-84

**Lab Sample ID: 680-142881-5**

**Date Collected: 09/05/17 09:40**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 15 | | 3.0 | 0.50 | 0.25 | mg/L | | 09/11/17 22:03 | 1 |
| Sulfate | 2.5 | J | 5.0 | 0.50 | 0.23 | mg/L | | 09/11/17 22:03 | 1 |
| Alkalinity | 200 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/08/17 09:15 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.8 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/09/17 01:08 | 1 |

## Client Sample ID: SB-2017-04-82-84

**Lab Sample ID: 680-142881-6**

**Date Collected: 09/05/17 13:20**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 22000 | | 100 | 85 | 22 | ug/L | | 09/11/17 22:56 | 1 |
| Manganese | 1000 | | 10 | 1.0 | 0.26 | ug/L | | 09/12/17 17:17 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 100 | | 5.0 | 1.0 | 0.33 | ug/L | | 09/12/17 21:46 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 12 | | 3.0 | 0.50 | 0.25 | mg/L | | 09/11/17 22:20 | 1 |
| Sulfate | 5.5 | | 5.0 | 0.50 | 0.23 | mg/L | | 09/11/17 22:20 | 1 |
| Alkalinity | 53 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/08/17 09:20 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.7 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/09/17 01:57 | 1 |

## Client Sample ID: SB-2017-03-92-94

**Lab Sample ID: 680-142881-7**

**Date Collected: 09/05/17 13:51**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 55000 | | 100 | 85 | 22 | ug/L | | 09/11/17 22:58 | 1 |
| Manganese | 9600 | | 10 | 1.0 | 0.26 | ug/L | | 09/12/17 17:20 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 960 | | 5.0 | 1.0 | 0.33 | ug/L | | 09/12/17 21:50 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 21 | | 3.0 | 0.50 | 0.25 | mg/L | | 09/11/17 22:36 | 1 |
| Sulfate | 2.1 | J | 5.0 | 0.50 | 0.23 | mg/L | | 09/11/17 22:36 | 1 |
| Alkalinity | 270 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/08/17 10:07 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

## Client Sample ID: SB-2017-03-92-94

**Lab Sample ID: 680-142881-7**
**Date Collected: 09/05/17 13:51**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.2 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/09/17 02:16 | 1 |

## Client Sample ID: SB-2017-04-92-94

**Lab Sample ID: 680-142881-8**
**Date Collected: 09/05/17 16:25**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 55000 | | 100 | 85 | 22 | ug/L | | 09/11/17 23:01 | 1 |
| Manganese | 3700 | | 10 | 1.0 | 0.26 | ug/L | | 09/12/17 17:22 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1200 | | 5.0 | 1.0 | 0.33 | ug/L | | 09/12/17 21:53 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18 | | 3.0 | 0.50 | 0.25 | mg/L | | 09/11/17 22:53 | 1 |
| Sulfate | 2.6 | J | 5.0 | 0.50 | 0.23 | mg/L | | 09/11/17 22:53 | 1 |
| Alkalinity | 270 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/08/17 09:50 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.2 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/09/17 02:32 | 1 |

## Client Sample ID: SB-2017-03-102-104

**Lab Sample ID: 680-142881-9**
**Date Collected: 09/05/17 16:20**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 9100 | | 100 | 85 | 22 | ug/L | | 09/11/17 23:04 | 1 |
| Manganese | 9900 | | 10 | 1.0 | 0.26 | ug/L | | 09/12/17 17:25 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 5.7 | | 5.0 | 1.0 | 0.33 | ug/L | | 09/12/17 21:57 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19 | | 3.0 | 0.50 | 0.25 | mg/L | | 09/11/17 23:10 | 1 |
| Sulfate | 3.6 | J | 5.0 | 0.50 | 0.23 | mg/L | | 09/11/17 23:10 | 1 |
| Alkalinity | 300 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/08/17 10:12 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.3 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/09/17 02:49 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

## Client Sample ID: SB-2017-04-102-104

**Lab Sample ID: 680-142881-10**

**Date Collected: 09/06/17 09:45**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 40000 | | 100 | 85 | 22 | ug/L | | 09/11/17 23:06 | 1 |
| Manganese | 1700 | | 10 | 1.0 | 0.26 | ug/L | | 09/12/17 17:28 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2900 | | 5.0 | 1.0 | 0.33 | ug/L | | 09/12/17 22:01 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 3.0 | 0.50 | 0.25 | mg/L | | 09/11/17 23:27 | 1 |
| Sulfate | 3.0 | J M | 5.0 | 0.50 | 0.23 | mg/L | | 09/11/17 23:27 | 1 |
| Alkalinity | 290 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/11/17 15:11 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.6 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/09/17 03:06 | 1 |

## Client Sample ID: SB-2017-04-108-110

**Lab Sample ID: 680-142881-11**

**Date Collected: 09/06/17 12:25**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 30000 | | 100 | 85 | 22 | ug/L | | 09/11/17 23:09 | 1 |
| Manganese | 5300 | | 10 | 1.0 | 0.26 | ug/L | | 09/12/17 17:30 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 800 | | 5.0 | 1.0 | 0.33 | ug/L | | 09/12/17 22:05 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 3.0 | 0.50 | 0.25 | mg/L | | 09/11/17 23:44 | 1 |
| Sulfate | 3.8 | J M | 5.0 | 0.50 | 0.23 | mg/L | | 09/11/17 23:44 | 1 |
| Alkalinity | 280 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/11/17 15:16 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.5 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/09/17 03:23 | 1 |

## Client Sample ID: SB-2017-02-22-24

**Lab Sample ID: 680-142881-12**

**Date Collected: 09/06/17 15:00**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 25 | J | 100 | 85 | 22 | ug/L | | 09/11/17 23:11 | 1 |
| Manganese | 1.8 | J | 10 | 1.0 | 0.26 | ug/L | | 09/12/17 17:33 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

## Client Sample ID: SB-2017-02-22-24

**Lab Sample ID: 680-142881-12**

**Date Collected: 09/06/17 15:00**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 5.8 | | 5.0 | 1.0 | 0.33 | ug/L | | 09/12/17 22:09 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.2 | | 3.0 | 0.50 | 0.25 | mg/L | | 09/12/17 00:00 | 1 |
| Sulfate | 4.5 | J | 5.0 | 0.50 | 0.23 | mg/L | | 09/12/17 00:00 | 1 |
| Alkalinity | 63 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/11/17 15:22 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.5 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/09/17 03:39 | 1 |

## Client Sample ID: FD-07

**Lab Sample ID: 680-142881-13**

**Date Collected: 09/06/17 09:50**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 37000 | | 100 | 85 | 22 | ug/L | | 09/11/17 23:14 | 1 |
| Manganese | 1700 | | 10 | 1.0 | 0.26 | ug/L | | 09/12/17 17:36 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3300 | | 5.0 | 1.0 | 0.33 | ug/L | | 09/12/17 22:12 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 3.0 | 0.50 | 0.25 | mg/L | | 09/12/17 01:41 | 1 |
| Sulfate | 3.1 | J | 5.0 | 0.50 | 0.23 | mg/L | | 09/12/17 01:41 | 1 |
| Alkalinity | 280 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/11/17 15:26 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.5 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/09/17 03:56 | 1 |

# QC Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-387058/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 387315** — **Prep Batch: 387058**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 85 | U | 100 | 85 | 22 | ug/L | | 09/11/17 22:15 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | 0.26 | ug/L | | 09/11/17 22:15 | 1 |

**Lab Sample ID: LCS 280-387058/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 387315** — **Prep Batch: 387058**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 1000 | 989 | | ug/L | | 99 | 87 - 115 |
| Manganese | 500 | 522 | | ug/L | | 104 | 90 - 114 |

**Lab Sample ID: LCSD 280-387058/3-A** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 387315** — **Prep Batch: 387058**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 1000 | 983 | | ug/L | | 98 | 87 - 115 | 1 | 20 |
| Manganese | 500 | 520 | | ug/L | | 104 | 90 - 114 | 0 | 20 |

**Lab Sample ID: 680-142881-1 MS** — **Client Sample ID: SB-2017-04-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387315** — **Prep Batch: 387058**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 1600 | J | 1000 | 2630 | | ug/L | | 103 | 87 - 115 |
| Manganese | 300 | J | 500 | 816 | | ug/L | | 103 | 90 - 114 |

**Lab Sample ID: 680-142881-1 MSD** — **Client Sample ID: SB-2017-04-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387315** — **Prep Batch: 387058**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 1600 | J | 1000 | 3400 | J | ug/L | | 180 | 87 - 115 | 26 | 20 |
| Manganese | 300 | J | 500 | 803 | | ug/L | | 101 | 90 - 114 | 2 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 280-387059/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 387436** — **Prep Batch: 387059**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.0 | U | 5.0 | 1.0 | 0.33 | ug/L | | 09/12/17 20:53 | 1 |

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: LCS 280-387059/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 387436** — **Prep Batch: 387059**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 40.0 | 38.2 | | ug/L | | 96 | 84 - 116 |

**Lab Sample ID: 680-142881-1 MS** — **Client Sample ID: SB-2017-04-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387436** — **Prep Batch: 387059**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.8 | J | 40.0 | 38.3 | | ug/L | | 91 | 84 - 116 |

**Lab Sample ID: 680-142881-1 MSD** — **Client Sample ID: SB-2017-04-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387436** — **Prep Batch: 387059**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.8 | J | 40.0 | 40.0 | | ug/L | | 95 | 84 - 116 | 4 | 20 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-387208/6** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387208**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 3.0 | 0.50 | 0.25 | mg/L | | 09/11/17 17:46 | 1 |
| Sulfate | 0.50 | U | 5.0 | 0.50 | 0.23 | mg/L | | 09/11/17 17:46 | 1 |

**Lab Sample ID: LCS 280-387208/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387208**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 100 | 100 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 100 | 100 | | mg/L | | 100 | 87 - 112 |

**Lab Sample ID: LCSD 280-387208/5** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387208**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 100 | 100 | | mg/L | | 100 | 87 - 111 | 0 | 10 |
| Sulfate | 100 | 100 | | mg/L | | 100 | 87 - 112 | 0 | 10 |

**Lab Sample ID: MRL 280-387208/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387208**

| Analyte | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 2.50 | 2.34 | J | mg/L | | 94 | 50 - 150 |
| Sulfate | 2.50 | 2.50 | J | mg/L | | 100 | 50 - 150 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: 680-142881-1 MS** — **Client Sample ID: SB-2017-04-52-54**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387208**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 3.0 | | 25.0 | 28.1 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 3.6 | J M | 25.0 | 29.5 | | mg/L | | 104 | 87 - 112 |

**Lab Sample ID: 680-142881-1 MSD** — **Client Sample ID: SB-2017-04-52-54**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387208**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 3.0 | | 25.0 | 28.7 | | mg/L | | 103 | 87 - 111 | 2 | 10 |
| Sulfate | 3.6 | J M | 25.0 | 30.7 | | mg/L | | 108 | 87 - 112 | 4 | 10 |

**Lab Sample ID: 680-142881-12 MS** — **Client Sample ID: SB-2017-02-22-24**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387208**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.2 | | 25.0 | 32.2 | | mg/L | | 104 | 87 - 111 |
| Sulfate | 4.5 | J | 25.0 | 30.1 | | mg/L | | 102 | 87 - 112 |

**Lab Sample ID: 680-142881-12 MSD** — **Client Sample ID: SB-2017-02-22-24**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387208**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.2 | | 25.0 | 33.3 | | mg/L | | 108 | 87 - 111 | 3 | 10 |
| Sulfate | 4.5 | J | 25.0 | 31.4 | | mg/L | | 107 | 87 - 112 | 4 | 10 |

**Lab Sample ID: 680-142881-1 DU** — **Client Sample ID: SB-2017-04-52-54**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387208**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Chloride | 3.0 | | 3.00 | | mg/L | | 2 | 10 |
| Sulfate | 3.6 | J M | 3.48 | J M | mg/L | | 2 | 10 |

**Lab Sample ID: 680-142881-12 DU** — **Client Sample ID: SB-2017-02-22-24**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387208**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Chloride | 6.2 | | 6.27 | | mg/L | | 0.6 | 10 |
| Sulfate | 4.5 | J | 4.29 | J M | mg/L | | 6 | 10 |

## Method: 9060 - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-387153/35** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387153**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 09/08/17 21:07 | 1 |

**Lab Sample ID: LCS 280-387153/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387153**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 25.0 | 24.6 | | mg/L | | 98 | 88 - 112 |

**Lab Sample ID: 680-142881-1 MS** — **Client Sample ID: SB-2017-04-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387153**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.6 | | 25.0 | 27.4 | | mg/L | | 99 | 88 - 112 |

**Lab Sample ID: 680-142881-1 MSD** — **Client Sample ID: SB-2017-04-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 387153**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.6 | | 25.0 | 27.5 | | mg/L | | 99 | 88 - 112 | 0 | 15 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-387016/31** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387016**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 2.85 | J | 5.0 | 3.2 | 1.1 | mg/L | | 09/08/17 09:45 | 1 |

**Lab Sample ID: MB 280-387016/5** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387016**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.18 | J | 5.0 | 3.2 | 1.1 | mg/L | | 09/08/17 07:17 | 1 |

**Lab Sample ID: LCS 280-387016/30** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387016**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 195 | | mg/L | | 98 | 90 - 110 |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: LCS 280-387016/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387016**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 195 | | mg/L | | 97 | 90 - 110 |

**Lab Sample ID: 680-142881-8 DU** — **Client Sample ID: SB-2017-04-92-94**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387016**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Alkalinity | 270 | B | 274 | | mg/L | | 3 | 10 |

**Lab Sample ID: MB 280-387318/5** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387318**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.2 | U | 5.0 | 3.2 | 1.1 | mg/L | | 09/11/17 13:59 | 1 |

**Lab Sample ID: LCS 280-387318/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387318**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 195 | | mg/L | | 98 | 90 - 110 |

# QC Association Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

## Metals

### Prep Batch: 387058

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142881-1 | SB-2017-04-52-54 | Dissolved | Water | 3005A | |
| 680-142881-2 | SB-2017-03-72-74 | Dissolved | Water | 3005A | |
| 680-142881-3 | SB-2017-04-62-64 | Dissolved | Water | 3005A | |
| 680-142881-4 | SB-2017-04-72-74 | Dissolved | Water | 3005A | |
| 680-142881-5 | SB-2017-03-82-84 | Dissolved | Water | 3005A | |
| 680-142881-6 | SB-2017-04-82-84 | Dissolved | Water | 3005A | |
| 680-142881-7 | SB-2017-03-92-94 | Dissolved | Water | 3005A | |
| 680-142881-8 | SB-2017-04-92-94 | Dissolved | Water | 3005A | |
| 680-142881-9 | SB-2017-03-102-104 | Dissolved | Water | 3005A | |
| 680-142881-10 | SB-2017-04-102-104 | Dissolved | Water | 3005A | |
| 680-142881-11 | SB-2017-04-108-110 | Dissolved | Water | 3005A | |
| 680-142881-12 | SB-2017-02-22-24 | Dissolved | Water | 3005A | |
| 680-142881-13 | FD-07 | Dissolved | Water | 3005A | |
| MB 280-387058/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 280-387058/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| LCSD 280-387058/3-A | Lab Control Sample Dup | Total Recoverable | Water | 3005A | |
| 680-142881-1 MS | SB-2017-04-52-54 | Dissolved | Water | 3005A | |
| 680-142881-1 MSD | SB-2017-04-52-54 | Dissolved | Water | 3005A | |

### Prep Batch: 387059

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142881-1 | SB-2017-04-52-54 | Dissolved | Water | 3005A | |
| 680-142881-2 | SB-2017-03-72-74 | Dissolved | Water | 3005A | |
| 680-142881-3 | SB-2017-04-62-64 | Dissolved | Water | 3005A | |
| 680-142881-4 | SB-2017-04-72-74 | Dissolved | Water | 3005A | |
| 680-142881-5 | SB-2017-03-82-84 | Dissolved | Water | 3005A | |
| 680-142881-6 | SB-2017-04-82-84 | Dissolved | Water | 3005A | |
| 680-142881-7 | SB-2017-03-92-94 | Dissolved | Water | 3005A | |
| 680-142881-8 | SB-2017-04-92-94 | Dissolved | Water | 3005A | |
| 680-142881-9 | SB-2017-03-102-104 | Dissolved | Water | 3005A | |
| 680-142881-10 | SB-2017-04-102-104 | Dissolved | Water | 3005A | |
| 680-142881-11 | SB-2017-04-108-110 | Dissolved | Water | 3005A | |
| 680-142881-12 | SB-2017-02-22-24 | Dissolved | Water | 3005A | |
| 680-142881-13 | FD-07 | Dissolved | Water | 3005A | |
| MB 280-387059/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 280-387059/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-142881-1 MS | SB-2017-04-52-54 | Dissolved | Water | 3005A | |
| 680-142881-1 MSD | SB-2017-04-52-54 | Dissolved | Water | 3005A | |

### Analysis Batch: 387315

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142881-1 | SB-2017-04-52-54 | Dissolved | Water | 6010C | 387058 |
| 680-142881-2 | SB-2017-03-72-74 | Dissolved | Water | 6010C | 387058 |
| 680-142881-3 | SB-2017-04-62-64 | Dissolved | Water | 6010C | 387058 |
| 680-142881-4 | SB-2017-04-72-74 | Dissolved | Water | 6010C | 387058 |
| 680-142881-5 | SB-2017-03-82-84 | Dissolved | Water | 6010C | 387058 |
| 680-142881-6 | SB-2017-04-82-84 | Dissolved | Water | 6010C | 387058 |
| 680-142881-7 | SB-2017-03-92-94 | Dissolved | Water | 6010C | 387058 |
| 680-142881-8 | SB-2017-04-92-94 | Dissolved | Water | 6010C | 387058 |
| 680-142881-9 | SB-2017-03-102-104 | Dissolved | Water | 6010C | 387058 |
| 680-142881-10 | SB-2017-04-102-104 | Dissolved | Water | 6010C | 387058 |

## Metals (Continued)

### Analysis Batch: 387315 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142881-11 | SB-2017-04-108-110 | Dissolved | Water | 6010C | 387058 |
| 680-142881-12 | SB-2017-02-22-24 | Dissolved | Water | 6010C | 387058 |
| 680-142881-13 | FD-07 | Dissolved | Water | 6010C | 387058 |
| MB 280-387058/1-A | Method Blank | Total Recoverable | Water | 6010C | 387058 |
| LCS 280-387058/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 387058 |
| LCSD 280-387058/3-A | Lab Control Sample Dup | Total Recoverable | Water | 6010C | 387058 |
| 680-142881-1 MS | SB-2017-04-52-54 | Dissolved | Water | 6010C | 387058 |
| 680-142881-1 MSD | SB-2017-04-52-54 | Dissolved | Water | 6010C | 387058 |

### Analysis Batch: 387436

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142881-1 | SB-2017-04-52-54 | Dissolved | Water | 6020A | 387059 |
| 680-142881-2 | SB-2017-03-72-74 | Dissolved | Water | 6020A | 387059 |
| 680-142881-3 | SB-2017-04-62-64 | Dissolved | Water | 6020A | 387059 |
| 680-142881-4 | SB-2017-04-72-74 | Dissolved | Water | 6020A | 387059 |
| 680-142881-5 | SB-2017-03-82-84 | Dissolved | Water | 6020A | 387059 |
| 680-142881-6 | SB-2017-04-82-84 | Dissolved | Water | 6020A | 387059 |
| 680-142881-7 | SB-2017-03-92-94 | Dissolved | Water | 6020A | 387059 |
| 680-142881-8 | SB-2017-04-92-94 | Dissolved | Water | 6020A | 387059 |
| 680-142881-9 | SB-2017-03-102-104 | Dissolved | Water | 6020A | 387059 |
| 680-142881-10 | SB-2017-04-102-104 | Dissolved | Water | 6020A | 387059 |
| 680-142881-11 | SB-2017-04-108-110 | Dissolved | Water | 6020A | 387059 |
| 680-142881-12 | SB-2017-02-22-24 | Dissolved | Water | 6020A | 387059 |
| 680-142881-13 | FD-07 | Dissolved | Water | 6020A | 387059 |
| MB 280-387059/1-A | Method Blank | Total Recoverable | Water | 6020A | 387059 |
| LCS 280-387059/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 387059 |
| 680-142881-1 MS | SB-2017-04-52-54 | Dissolved | Water | 6020A | 387059 |
| 680-142881-1 MSD | SB-2017-04-52-54 | Dissolved | Water | 6020A | 387059 |

### Analysis Batch: 387470

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142881-5 | SB-2017-03-82-84 | Dissolved | Water | 6010C | 387058 |
| 680-142881-6 | SB-2017-04-82-84 | Dissolved | Water | 6010C | 387058 |
| 680-142881-7 | SB-2017-03-92-94 | Dissolved | Water | 6010C | 387058 |
| 680-142881-8 | SB-2017-04-92-94 | Dissolved | Water | 6010C | 387058 |
| 680-142881-9 | SB-2017-03-102-104 | Dissolved | Water | 6010C | 387058 |
| 680-142881-10 | SB-2017-04-102-104 | Dissolved | Water | 6010C | 387058 |
| 680-142881-11 | SB-2017-04-108-110 | Dissolved | Water | 6010C | 387058 |
| 680-142881-12 | SB-2017-02-22-24 | Dissolved | Water | 6010C | 387058 |
| 680-142881-13 | FD-07 | Dissolved | Water | 6010C | 387058 |

## General Chemistry

### Analysis Batch: 387016

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142881-1 | SB-2017-04-52-54 | Total/NA | Water | SM 2320B | |
| 680-142881-2 | SB-2017-03-72-74 | Total/NA | Water | SM 2320B | |
| 680-142881-3 | SB-2017-04-62-64 | Total/NA | Water | SM 2320B | |
| 680-142881-4 | SB-2017-04-72-74 | Total/NA | Water | SM 2320B | |
| 680-142881-5 | SB-2017-03-82-84 | Total/NA | Water | SM 2320B | |

## General Chemistry (Continued)

### Analysis Batch: 387016 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142881-6 | SB-2017-04-82-84 | Total/NA | Water | SM 2320B | |
| 680-142881-7 | SB-2017-03-92-94 | Total/NA | Water | SM 2320B | |
| 680-142881-8 | SB-2017-04-92-94 | Total/NA | Water | SM 2320B | |
| 680-142881-9 | SB-2017-03-102-104 | Total/NA | Water | SM 2320B | |
| MB 280-387016/31 | Method Blank | Total/NA | Water | SM 2320B | |
| MB 280-387016/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-387016/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| LCS 280-387016/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 680-142881-8 DU | SB-2017-04-92-94 | Total/NA | Water | SM 2320B | |

### Analysis Batch: 387153

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142881-1 | SB-2017-04-52-54 | Dissolved | Water | 9060 | |
| 680-142881-2 | SB-2017-03-72-74 | Dissolved | Water | 9060 | |
| 680-142881-3 | SB-2017-04-62-64 | Dissolved | Water | 9060 | |
| 680-142881-4 | SB-2017-04-72-74 | Dissolved | Water | 9060 | |
| 680-142881-5 | SB-2017-03-82-84 | Dissolved | Water | 9060 | |
| 680-142881-6 | SB-2017-04-82-84 | Dissolved | Water | 9060 | |
| 680-142881-7 | SB-2017-03-92-94 | Dissolved | Water | 9060 | |
| 680-142881-8 | SB-2017-04-92-94 | Dissolved | Water | 9060 | |
| 680-142881-9 | SB-2017-03-102-104 | Dissolved | Water | 9060 | |
| 680-142881-10 | SB-2017-04-102-104 | Dissolved | Water | 9060 | |
| 680-142881-11 | SB-2017-04-108-110 | Dissolved | Water | 9060 | |
| 680-142881-12 | SB-2017-02-22-24 | Dissolved | Water | 9060 | |
| 680-142881-13 | FD-07 | Dissolved | Water | 9060 | |
| MB 280-387153/35 | Method Blank | Dissolved | Water | 9060 | |
| LCS 280-387153/34 | Lab Control Sample | Dissolved | Water | 9060 | |
| 680-142881-1 MS | SB-2017-04-52-54 | Dissolved | Water | 9060 | |
| 680-142881-1 MSD | SB-2017-04-52-54 | Dissolved | Water | 9060 | |

### Analysis Batch: 387208

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142881-1 | SB-2017-04-52-54 | Total/NA | Water | 9056A | |
| 680-142881-2 | SB-2017-03-72-74 | Total/NA | Water | 9056A | |
| 680-142881-3 | SB-2017-04-62-64 | Total/NA | Water | 9056A | |
| 680-142881-4 | SB-2017-04-72-74 | Total/NA | Water | 9056A | |
| 680-142881-5 | SB-2017-03-82-84 | Total/NA | Water | 9056A | |
| 680-142881-6 | SB-2017-04-82-84 | Total/NA | Water | 9056A | |
| 680-142881-7 | SB-2017-03-92-94 | Total/NA | Water | 9056A | |
| 680-142881-8 | SB-2017-04-92-94 | Total/NA | Water | 9056A | |
| 680-142881-9 | SB-2017-03-102-104 | Total/NA | Water | 9056A | |
| 680-142881-10 | SB-2017-04-102-104 | Total/NA | Water | 9056A | |
| 680-142881-11 | SB-2017-04-108-110 | Total/NA | Water | 9056A | |
| 680-142881-12 | SB-2017-02-22-24 | Total/NA | Water | 9056A | |
| 680-142881-13 | FD-07 | Total/NA | Water | 9056A | |
| MB 280-387208/6 | Method Blank | Total/NA | Water | 9056A | |
| LCS 280-387208/4 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 280-387208/5 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| MRL 280-387208/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| 680-142881-1 MS | SB-2017-04-52-54 | Total/NA | Water | 9056A | |
| 680-142881-1 MSD | SB-2017-04-52-54 | Total/NA | Water | 9056A | |

## General Chemistry (Continued)

### Analysis Batch: 387208 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142881-12 MS | SB-2017-02-22-24 | Total/NA | Water | 9056A | |
| 680-142881-12 MSD | SB-2017-02-22-24 | Total/NA | Water | 9056A | |
| 680-142881-1 DU | SB-2017-04-52-54 | Total/NA | Water | 9056A | |
| 680-142881-12 DU | SB-2017-02-22-24 | Total/NA | Water | 9056A | |

### Analysis Batch: 387318

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142881-10 | SB-2017-04-102-104 | Total/NA | Water | SM 2320B | |
| 680-142881-11 | SB-2017-04-108-110 | Total/NA | Water | SM 2320B | |
| 680-142881-12 | SB-2017-02-22-24 | Total/NA | Water | SM 2320B | |
| 680-142881-13 | FD-07 | Total/NA | Water | SM 2320B | |
| MB 280-387318/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-387318/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

## Client Sample ID: SB-2017-04-52-54

**Lab Sample ID: 680-142881-1**
**Date Collected: 09/01/17 13:50**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387315 | 09/11/17 22:23 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387059 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387436 | 09/12/17 21:00 | LMT | TAL DEN |
| | Instrument ID: | MT_077 | | | | | | | | |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387208 | 09/11/17 19:32 | TLP | TAL DEN |
| | Instrument ID: | WC_IonChrom8 | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 387153 | 09/08/17 23:28 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387016 | 09/08/17 10:18 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-03-72-74

**Lab Sample ID: 680-142881-2**
**Date Collected: 09/01/17 14:40**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387315 | 09/11/17 22:35 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387059 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387436 | 09/12/17 21:19 | LMT | TAL DEN |
| | Instrument ID: | MT_077 | | | | | | | | |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387208 | 09/11/17 20:39 | TLP | TAL DEN |
| | Instrument ID: | WC_IonChrom8 | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 387153 | 09/09/17 00:14 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387016 | 09/08/17 10:23 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-04-62-64

**Lab Sample ID: 680-142881-3**
**Date Collected: 09/05/17 09:10**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387315 | 09/11/17 22:38 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387059 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387436 | 09/12/17 21:23 | LMT | TAL DEN |
| | Instrument ID: | MT_077 | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

## Client Sample ID: SB-2017-04-62-64 — Lab Sample ID: 680-142881-3

**Date Collected: 09/05/17 09:10** — **Matrix: Water**
**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387208 | 09/11/17 20:56 | TLP | TAL DEN |
| | Instrument ID: | WC_IonChrom8 | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 387153 | 09/09/17 00:31 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387016 | 09/08/17 10:01 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-04-72-74 — Lab Sample ID: 680-142881-4

**Date Collected: 09/05/17 11:40** — **Matrix: Water**
**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387315 | 09/11/17 22:50 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387059 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387436 | 09/12/17 21:38 | LMT | TAL DEN |
| | Instrument ID: | MT_077 | | | | | | | | |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387208 | 09/11/17 21:46 | TLP | TAL DEN |
| | Instrument ID: | WC_IonChrom8 | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 387153 | 09/09/17 00:47 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387016 | 09/08/17 09:09 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-03-82-84 — Lab Sample ID: 680-142881-5

**Date Collected: 09/05/17 09:40** — **Matrix: Water**
**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387315 | 09/11/17 22:53 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387470 | 09/12/17 17:15 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387059 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387436 | 09/12/17 21:42 | LMT | TAL DEN |
| | Instrument ID: | MT_077 | | | | | | | | |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387208 | 09/11/17 22:03 | TLP | TAL DEN |
| | Instrument ID: | WC_IonChrom8 | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 387153 | 09/09/17 01:08 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |

## Client Sample ID: SB-2017-03-82-84 — Lab Sample ID: 680-142881-5

**Date Collected: 09/05/17 09:40** — **Matrix: Water**
**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | SM 2320B | | 1 | | | 387016 | 09/08/17 09:15 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-04-82-84 — Lab Sample ID: 680-142881-6

**Date Collected: 09/05/17 13:20** — **Matrix: Water**
**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387315 | 09/11/17 22:56 | CML | TAL DEN |
| | Instrument ID: MT_025 | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387470 | 09/12/17 17:17 | CML | TAL DEN |
| | Instrument ID: MT_025 | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387059 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387436 | 09/12/17 21:46 | LMT | TAL DEN |
| | Instrument ID: MT_077 | | | | | | | | | |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387208 | 09/11/17 22:20 | TLP | TAL DEN |
| | Instrument ID: WC_IonChrom8 | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 387153 | 09/09/17 01:57 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387016 | 09/08/17 09:20 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-03-92-94 — Lab Sample ID: 680-142881-7

**Date Collected: 09/05/17 13:51** — **Matrix: Water**
**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387315 | 09/11/17 22:58 | CML | TAL DEN |
| | Instrument ID: MT_025 | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387470 | 09/12/17 17:20 | CML | TAL DEN |
| | Instrument ID: MT_025 | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387059 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387436 | 09/12/17 21:50 | LMT | TAL DEN |
| | Instrument ID: MT_077 | | | | | | | | | |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387208 | 09/11/17 22:36 | TLP | TAL DEN |
| | Instrument ID: WC_IonChrom8 | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 387153 | 09/09/17 02:16 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387016 | 09/08/17 10:07 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

## Client Sample ID: SB-2017-04-92-94

**Lab Sample ID: 680-142881-8**

**Date Collected: 09/05/17 16:25**

**Matrix: Water**

**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387315 | 09/11/17 23:01 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387470 | 09/12/17 17:22 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387059 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387436 | 09/12/17 21:53 | LMT | TAL DEN |
| | Instrument ID: | MT_077 | | | | | | | | |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387208 | 09/11/17 22:53 | TLP | TAL DEN |
| | Instrument ID: | WC_IonChrom8 | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 387153 | 09/09/17 02:32 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387016 | 09/08/17 09:50 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-03-102-104

**Lab Sample ID: 680-142881-9**

**Date Collected: 09/05/17 16:20**

**Matrix: Water**

**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387315 | 09/11/17 23:04 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387470 | 09/12/17 17:25 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387059 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387436 | 09/12/17 21:57 | LMT | TAL DEN |
| | Instrument ID: | MT_077 | | | | | | | | |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387208 | 09/11/17 23:10 | TLP | TAL DEN |
| | Instrument ID: | WC_IonChrom8 | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 387153 | 09/09/17 02:49 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387016 | 09/08/17 10:12 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-04-102-104

**Lab Sample ID: 680-142881-10**

**Date Collected: 09/06/17 09:45**

**Matrix: Water**

**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

## Client Sample ID: SB-2017-04-102-104

**Lab Sample ID: 680-142881-10**

**Date Collected: 09/06/17 09:45**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 6010C | | 1 | | | 387315 | 09/11/17 23:06 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387470 | 09/12/17 17:28 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387059 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387436 | 09/12/17 22:01 | LMT | TAL DEN |
| | Instrument ID: | MT_077 | | | | | | | | |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387208 | 09/11/17 23:27 | TLP | TAL DEN |
| | Instrument ID: | WC_IonChrom8 | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 387153 | 09/09/17 03:06 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387318 | 09/11/17 15:11 | A1D | TAL DEN |
| | Instrument ID: | WC-AT3 | | | | | | | | |

## Client Sample ID: SB-2017-04-108-110

**Lab Sample ID: 680-142881-11**

**Date Collected: 09/06/17 12:25**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387315 | 09/11/17 23:09 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387470 | 09/12/17 17:30 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387059 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387436 | 09/12/17 22:05 | LMT | TAL DEN |
| | Instrument ID: | MT_077 | | | | | | | | |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387208 | 09/11/17 23:44 | TLP | TAL DEN |
| | Instrument ID: | WC_IonChrom8 | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 387153 | 09/09/17 03:23 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387318 | 09/11/17 15:16 | A1D | TAL DEN |
| | Instrument ID: | WC-AT3 | | | | | | | | |

## Client Sample ID: SB-2017-02-22-24

**Lab Sample ID: 680-142881-12**

**Date Collected: 09/06/17 15:00**
**Matrix: Water**
**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387315 | 09/11/17 23:11 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387470 | 09/12/17 17:33 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387059 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387436 | 09/12/17 22:09 | LMT | TAL DEN |
| | Instrument ID: | MT_077 | | | | | | | | |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387208 | 09/12/17 00:00 | TLP | TAL DEN |
| | Instrument ID: | WC_IonChrom8 | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 387153 | 09/09/17 03:39 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387318 | 09/11/17 15:22 | A1D | TAL DEN |
| | Instrument ID: | WC-AT3 | | | | | | | | |

## Client Sample ID: FD-07

## Lab Sample ID: 680-142881-13

**Date Collected: 09/06/17 09:50**

**Matrix: Water**

**Date Received: 09/07/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387315 | 09/11/17 23:14 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387058 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6010C | | 1 | | | 387470 | 09/12/17 17:36 | CML | TAL DEN |
| | Instrument ID: | MT_025 | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 387059 | 09/11/17 13:30 | SEJ | TAL DEN |
| Dissolved | Analysis | 6020A | | 1 | | | 387436 | 09/12/17 22:12 | LMT | TAL DEN |
| | Instrument ID: | MT_077 | | | | | | | | |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 387208 | 09/12/17 01:41 | TLP | TAL DEN |
| | Instrument ID: | WC_IonChrom8 | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 387153 | 09/09/17 03:56 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387318 | 09/11/17 15:26 | A1D | TAL DEN |
| | Instrument ID: | WC-AT3 | | | | | | | | |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

350325-Boston

680-142881 Chain of Custody

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affiliation: Kerk Halbern / KGS

Sampler(s) Signature(s): Kerk Halbern

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue, Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml-glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-04-52-54 | 9/1/17 | 1350 | GW | 12 | X | X | X | X | | | | | | MS/MSD-1418 | |
| SB-2017-03-72-74 | 9/1/17 | 1440 | GW | 4 | X | X | X | X | | | | | | | |
| SB-2017-04-62-64 | 9-5-17 | 910 | GW | 4 | X | X | X | X | | | | | | | |
| SB-2017-04-72-74 | 9-5-17 | 1140 | GW | 4 | X | X | X | X | | | | | | | |
| SB-2017-03-82-84 | 9-5-17 | 940 | GW | 4 | X | X | X | X | | | | | | | |
| SB-2017-04-82-84 | 9-5-17 | 1320 | GW | 4 | X | X | X | X | | | | | | | |
| SB-2017-03-92-94 | 9-5-17 | 1351 | GW | 4 | X | X | X | X | | | | | | | |
| SB-2017-04-92-94 | 9-5-17 | 1625 | GW | 4 | X | X | X | X | | | | | | | |
| SB-2017-03-102-104 | 9-5-17 | 1620 | GW | 4 | X | X | X | X | | | | | | | |

Total Number of Containers

Shipping Details: courier pick up

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | Kerk Halbern | 9-6-17 | 1510 | | [illegible] | 9-6-17 | 1510 |
| Additional Comments: | | | [illegible] | 9-6-17 | 1800 | | [illegible] | 9-7-17 | 0915 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐
On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

0.5, 0.2 IR#7 0.1
RP 9-7-17

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: ___ of: ___

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affiliation
Kerk Halberg / KGS

Sampler(s) Signature(s)
Kerk Halberg

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017- GY-102-104 | 9-6-17 | 945 | GW | 4 | X | X | X | X | | | | | | | |
| SB-2017- GY-108-110 | 9-6-17 | 1225 | GW | 4 | X | X | X | X | | | | | | | |
| SB-2017- -02-22-24 | 9-6-17 | 1560 | GW | 4 | X | X | X | X | | | | | | | |
| SB-2017- | | | GW | | | | | | | | | | | | |
| SB-2017- | | | GW | | | | | | | | | | | | |
| SB-2017- | | | GW | | | | | | | | | | | | |
| FD-07 | 9-6-17 | 950 | GW | 4 | X | X | X | X | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

Shipping Details: courier pick up

← Total Number of Containers

Date Out: Via:
Returned: Via:
Additional Comments:
* = Dissolved Metals include: Fe, Mn (6010); As (6020)

| Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|
| | Kerk Halberg KGS | 9-6-17 | 1510 | | [illegible] | 9-6-17 | 1510 |
| | [illegible] | 9-6-17 | 1900 | | [illegible] | 9-7-17 | 0925 |

email logins and results to:
lekes@komangs.com

**Lab Comments**
Seal #
Preserve Where Applicable ☐
On ICE ☐
Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

# Login Sample Receipt Checklist

Client: KOMAN Government Solutions, LLC

Job Number: 680-142881-1

**Login Number: 142881**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: Ragnaldsen, Amy E**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | N/A | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: KOMAN Government Solutions, LLC

Job Number: 680-142881-1

**Login Number: 142881**
**List Number: 2**
**Creator: Jewell, Connie C**

**List Source: TestAmerica Denver**
**List Creation: 09/08/17 09:24 AM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | | |
| The cooler's custody seal, if present, is intact. | | |
| Sample custody seals, if present, are intact. | | |
| The cooler or samples do not appear to have been compromised or tampered with. | | |
| Samples were received on ice. | | |
| Cooler Temperature is acceptable. | | |
| Cooler Temperature is recorded. | | |
| COC is present. | | |
| COC is filled out in ink and legible. | | |
| COC is filled out with all pertinent information. | | |
| Is the Field Sampler's name present on COC? | | |
| There are no discrepancies between the containers received and the COC. | | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | | |
| Sample containers have legible labels. | | |
| Containers are not broken or leaking. | | |
| Sample collection date/times are provided. | | |
| Appropriate sample containers are used. | | |
| Sample bottles are completely filled. | | |
| Sample Preservation Verified. | | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | | |
| Multiphasic samples are not present. | | |
| Samples do not require splitting or compositing. | | |
| Residual Chlorine Checked. | | |

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

## Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| | AFCEE | | SAVLAB | |
| Alabama | State Program | 4 | 41450 | 06-30-18 |
| Alaska | State Program | 10 | | 06-30-18 |
| Alaska (UST) | State Program | 10 | UST-104 | 11-05-17 * |
| Arizona | State Program | 9 | AZ808 | 12-14-17 |
| Arkansas DEQ | State Program | 6 | 88-0692 | 02-01-18 |
| California | State Program | 9 | 2939 | 06-30-17 * |
| Colorado | State Program | 8 | N/A | 12-31-17 |
| Connecticut | State Program | 1 | PH-0161 | 03-31-19 |
| Florida | NELAP | 4 | E87052 | 06-30-18 |
| GA Dept. of Agriculture | State Program | 4 | N/A | 06-12-18 |
| Georgia | State Program | 4 | 803 | 06-30-18 |
| Guam | State Program | 9 | 15-005r | 04-16-18 |
| Hawaii | State Program | 9 | N/A | 06-30-18 |
| Illinois | NELAP | 5 | 200022 | 11-30-17 |
| Indiana | State Program | 5 | N/A | 06-30-18 |
| Iowa | State Program | 7 | 353 | 06-30-19 |
| Kentucky (DW) | State Program | 4 | 90084 | 12-31-17 |
| Kentucky (UST) | State Program | 4 | 18 | 06-30-18 |
| Kentucky (WW) | State Program | 4 | 90084 | 12-31-17 |
| L-A-B | DoD ELAP | | L2463 | 09-22-19 |
| L-A-B | ISO/IEC 17025 | | L2463.01 | 09-22-19 |
| Louisiana | NELAP | 6 | 30690 | 06-30-18 |
| Louisiana (DW) | NELAP | 6 | LA160019 | 12-31-17 |
| Maine | State Program | 1 | GA00006 | 09-24-18 |
| Maryland | State Program | 3 | 250 | 12-31-17 |
| Massachusetts | State Program | 1 | M-GA006 | 06-30-18 |
| Michigan | State Program | 5 | 9925 | 06-30-17 * |
| Mississippi | State Program | 4 | N/A | 06-30-18 |
| Nebraska | State Program | 7 | TestAmerica-Savannah | 06-30-18 |
| New Jersey | NELAP | 2 | GA769 | 06-30-18 |
| New Mexico | State Program | 6 | N/A | 06-30-18 |
| New York | NELAP | 2 | 10842 | 03-31-18 |
| North Carolina (DW) | State Program | 4 | 13701 | 07-31-18 |
| North Carolina (WW/SW) | State Program | 4 | 269 | 12-31-17 |
| Oklahoma | State Program | 6 | 9984 | 08-31-18 |
| Pennsylvania | NELAP | 3 | 68-00474 | 06-30-18 |
| Puerto Rico | State Program | 2 | GA00006 | 12-31-17 |
| South Carolina | State Program | 4 | 98001 | 06-30-17 * |
| Tennessee | State Program | 4 | TN02961 | 06-30-18 |
| Texas | NELAP | 6 | T104704185-16-9 | 11-30-17 |
| Texas | State Program | 6 | T104704185 | 06-30-18 |
| US Fish & Wildlife | Federal | | LE058448-0 | 07-31-18 |
| USDA | Federal | | SAV 3-04 | 06-14-20 * |
| Virginia | NELAP | 3 | 460161 | 06-14-18 |
| Washington | State Program | 10 | C805 | 06-10-18 |
| West Virginia (DW) | State Program | 3 | 9950C | 12-31-17 |
| West Virginia DEP | State Program | 3 | 094 | 06-30-18 |
| Wisconsin | State Program | 5 | 999819810 | 08-31-17 * |
| Wyoming | State Program | 8 | 8TMS-L | 06-30-16 * |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142881-1

## Laboratory: TestAmerica Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

TestAmerica Job ID: 680-143024-1
Client Project/Site: Devens - SHL EPA SOW Phase 1

For:
KOMAN Government Solutions, LLC
293 Boston Post Road
Suite 100
Marlborough, Massachusetts 01752

Attn: Laurie Ekes

*Authorized for release by:*
*9/27/2017 9:50:15 AM*

Jerry Lanier, Project Manager I
(912)354-7858 e.3410
jerry.lanier@testamericainc.com

LINKS

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*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Job ID: 680-143024-1

**Laboratory: TestAmerica Savannah**

**Narrative**

# CASE NARRATIVE

## Client: KOMAN Government Solutions, LLC

## Project: Devens - SHL EPA SOW Phase 1

## Report Number: 680-143024-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**

The samples were received on 09/14/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.1º C, 0.4º C, 0.5º C, 0.5º C and 4.1º C.

**METALS (ICP) - DISSOLVED**

Samples SB-2017-02-82-84 (680-143024-1), SB-2017-05-82-84 (680-143024-2), SB-2017-02-92-94 (680-143024-3), SB-2017-02-102-1044 (680-143024-4), SB-2017-05-92-94 (680-143024-5), SB-2017-02-111-113 (680-143024-6), FD-07 (680-143024-7), SB-2017-05-102-104 (680-143024-8), SB-2017-17-12-14 (680-143024-9), SB-2017-17-22-24 (680-143024-10), SB-2017-17-32-34 (680-143024-11), SB-2017-17-42-44 (680-143024-12), SB-2017-17-52-54 (680-143024-13), SB-2017-05-112-114 (680-143024-14), SB-2017-18-12-14 (680-143024-15), SB-2017-18-22-24 (680-143024-16), SB-2017-18-32-34 (680-143024-17), SB-2017-18-42-44 (680-143024-18), FD-08 (680-143024-19), SB-2017-18-52-54 (680-143024-20), SB-2017-17-62-64 (680-143024-21), SB-2017-17-72-74 (680-143024-22), SB-2017-18-62-64 (680-143024-23), SB-2017-17-78-80 (680-143024-24), SB-2017-18-72-74 (680-143024-25) and SB-2017-16-22-24 (680-143024-26) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/15/2017 and 09/18/2017 and analyzed on 09/18/2017 and 09/20/2017.

Iron failed the recovery criteria low for the MS of sample SB-2017-17-62-64MS (680-143024-21) in batch 680-495230.

Iron and Manganese failed the recovery criteria low for the MSD of sample SB-2017-17-62-64MSD (680-143024-21) in batch 680-495230.

Iron and Manganese failed the recovery criteria low for the MS/MSD of sample SB-2017-05-102-104 (680-143024-8) in batch 680-495534.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**

Samples SB-2017-02-82-84 (680-143024-1), SB-2017-05-82-84 (680-143024-2), SB-2017-02-92-94 (680-143024-3), SB-2017-02-102-1044 (680-143024-4), SB-2017-05-92-94 (680-143024-5), SB-2017-02-111-113 (680-143024-6), FD-07 (680-143024-7), SB-2017-05-102-104 (680-143024-8), SB-2017-17-12-14 (680-143024-9), SB-2017-17-22-24 (680-143024-10), SB-2017-17-32-34 (680-143024-11), SB-2017-17-42-44 (680-143024-12), SB-2017-17-52-54 (680-143024-13), SB-2017-05-112-114 (680-143024-14), SB-2017-18-12-14 (680-143024-15), SB-2017-18-22-24 (680-143024-16), SB-2017-18-32-34 (680-143024-17), SB-2017-18-42-44 (680-143024-18), FD-08 (680-143024-19), SB-2017-18-52-54 (680-143024-20), SB-2017-17-62-64 (680-143024-21), SB-2017-17-72-74 (680-143024-22), SB-2017-18-62-64 (680-143024-23), SB-2017-17-78-80 (680-143024-24), SB-2017-18-72-74 (680-143024-25) and SB-2017-16-22-24 (680-143024-26) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 09/15/2017 and 09/18/2017 and analyzed on 09/19/2017.

Arsenic failed the recovery criteria high for the MS of sample SB-2017-05-102-104MS (680-143024-8) in batch 680-495330.

Refer to the QC report for details.

## Job ID: 680-143024-1 (Continued)

### Laboratory: TestAmerica Savannah (Continued)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**

Samples SB-2017-02-82-84 (680-143024-1), SB-2017-05-82-84 (680-143024-2), SB-2017-02-92-94 (680-143024-3), SB-2017-02-102-1044 (680-143024-4), SB-2017-05-92-94 (680-143024-5), SB-2017-02-111-113 (680-143024-6), FD-07 (680-143024-7), SB-2017-05-102-104 (680-143024-8), SB-2017-17-12-14 (680-143024-9), SB-2017-17-22-24 (680-143024-10), SB-2017-17-32-34 (680-143024-11), SB-2017-17-42-44 (680-143024-12), SB-2017-17-52-54 (680-143024-13), SB-2017-05-112-114 (680-143024-14), SB-2017-18-12-14 (680-143024-15), SB-2017-18-22-24 (680-143024-16), SB-2017-18-32-34 (680-143024-17), SB-2017-18-42-44 (680-143024-18), FD-08 (680-143024-19), SB-2017-18-52-54 (680-143024-20), SB-2017-17-62-64 (680-143024-21), SB-2017-17-72-74 (680-143024-22), SB-2017-18-62-64 (680-143024-23), SB-2017-17-78-80 (680-143024-24), SB-2017-18-72-74 (680-143024-25) and SB-2017-16-22-24 (680-143024-26) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 09/15/2017, 09/19/2017 and 09/21/2017.

Alkalinity was detected in method blank MB 280-387954/30 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Alkalinity was detected in method blank MB 280-387954/5 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Alkalinity was detected in method blank MB 280-388215/31 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Alkalinity was detected in method blank MB 280-388592/31 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**

Samples SB-2017-02-82-84 (680-143024-1), SB-2017-05-82-84 (680-143024-2), SB-2017-02-92-94 (680-143024-3), SB-2017-02-102-1044 (680-143024-4), SB-2017-05-92-94 (680-143024-5), SB-2017-02-111-113 (680-143024-6), FD-07 (680-143024-7), SB-2017-05-102-104 (680-143024-8), SB-2017-17-12-14 (680-143024-9), SB-2017-17-22-24 (680-143024-10), SB-2017-17-32-34 (680-143024-11), SB-2017-17-42-44 (680-143024-12), SB-2017-17-52-54 (680-143024-13), SB-2017-05-112-114 (680-143024-14), SB-2017-18-12-14 (680-143024-15), SB-2017-18-22-24 (680-143024-16), SB-2017-18-32-34 (680-143024-17), SB-2017-18-42-44 (680-143024-18), FD-08 (680-143024-19), SB-2017-18-52-54 (680-143024-20), SB-2017-17-62-64 (680-143024-21), SB-2017-17-72-74 (680-143024-22), SB-2017-18-62-64 (680-143024-23), SB-2017-17-78-80 (680-143024-24), SB-2017-18-72-74 (680-143024-25) and SB-2017-16-22-24 (680-143024-26) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 09/16/2017, 09/17/2017, 09/19/2017 and 09/20/2017.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

Refer to the QC report for details.

Samples SB-2017-17-32-34 (680-143024-11)[10X], SB-2017-17-42-44 (680-143024-12)[25X], SB-2017-17-52-54 (680-143024-13)[25X], SB-2017-17-62-64 (680-143024-21)[2X] and SB-2017-16-22-24 (680-143024-26)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**DISSOLVED ORGANIC CARBON**

Samples SB-2017-02-82-84 (680-143024-1), SB-2017-05-82-84 (680-143024-2), SB-2017-02-92-94 (680-143024-3), SB-2017-02-102-1044 (680-143024-4), SB-2017-05-92-94 (680-143024-5), SB-2017-02-111-113 (680-143024-6), FD-07 (680-143024-7), SB-2017-05-102-104 (680-143024-8), SB-2017-17-12-14 (680-143024-9), SB-2017-17-22-24 (680-143024-10), SB-2017-17-32-34 (680-143024-11), SB-2017-17-42-44 (680-143024-12), SB-2017-17-52-54 (680-143024-13), SB-2017-05-112-114 (680-143024-14), SB-2017-18-12-14 (680-143024-15), SB-2017-18-22-24 (680-143024-16), SB-2017-18-32-34 (680-143024-17), SB-2017-18-42-44

## Job ID: 680-143024-1 (Continued)

### Laboratory: TestAmerica Savannah (Continued)

(680-143024-18), FD-08 (680-143024-19), SB-2017-18-52-54 (680-143024-20), SB-2017-17-62-64 (680-143024-21), SB-2017-17-72-74 (680-143024-22), SB-2017-18-62-64 (680-143024-23), SB-2017-17-78-80 (680-143024-24), SB-2017-18-72-74 (680-143024-25) and SB-2017-16-22-24 (680-143024-26) were analyzed for dissolved organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 09/19/2017 and 09/20/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 680-143024-1 | SB-2017-02-82-84 | Water | 09/11/17 09:40 | 09/14/17 09:35 |
| 680-143024-2 | SB-2017-05-82-84 | Water | 09/11/17 10:25 | 09/14/17 09:35 |
| 680-143024-3 | SB-2017-02-92-94 | Water | 09/11/17 11:35 | 09/14/17 09:35 |
| 680-143024-4 | SB-2017-02-102-1044 | Water | 09/11/17 13:10 | 09/14/17 09:35 |
| 680-143024-5 | SB-2017-05-92-94 | Water | 09/11/17 12:10 | 09/14/17 09:35 |
| 680-143024-6 | SB-2017-02-111-113 | Water | 09/11/17 15:50 | 09/14/17 09:35 |
| 680-143024-7 | FD-07 | Water | 09/11/17 09:45 | 09/14/17 09:35 |
| 680-143024-8 | SB-2017-05-102-104 | Water | 09/11/17 12:15 | 09/14/17 09:35 |
| 680-143024-9 | SB-2017-17-12-14 | Water | 09/12/17 09:35 | 09/14/17 09:35 |
| 680-143024-10 | SB-2017-17-22-24 | Water | 09/12/17 11:00 | 09/14/17 09:35 |
| 680-143024-11 | SB-2017-17-32-34 | Water | 09/12/17 12:40 | 09/14/17 09:35 |
| 680-143024-12 | SB-2017-17-42-44 | Water | 09/12/17 14:30 | 09/14/17 09:35 |
| 680-143024-13 | SB-2017-17-52-54 | Water | 09/12/17 16:00 | 09/14/17 09:35 |
| 680-143024-14 | SB-2017-05-112-114 | Water | 09/12/17 09:40 | 09/14/17 09:35 |
| 680-143024-15 | SB-2017-18-12-14 | Water | 09/12/17 12:50 | 09/14/17 09:35 |
| 680-143024-16 | SB-2017-18-22-24 | Water | 09/12/17 13:50 | 09/14/17 09:35 |
| 680-143024-17 | SB-2017-18-32-34 | Water | 09/12/17 15:20 | 09/14/17 09:35 |
| 680-143024-18 | SB-2017-18-42-44 | Water | 09/12/17 17:00 | 09/14/17 09:35 |
| 680-143024-19 | FD-08 | Water | 09/12/17 15:25 | 09/14/17 09:35 |
| 680-143024-20 | SB-2017-18-52-54 | Water | 09/13/17 09:35 | 09/14/17 09:35 |
| 680-143024-21 | SB-2017-17-62-64 | Water | 09/13/17 09:30 | 09/14/17 09:35 |
| 680-143024-22 | SB-2017-17-72-74 | Water | 09/13/17 11:00 | 09/14/17 09:35 |
| 680-143024-23 | SB-2017-18-62-64 | Water | 09/13/17 11:35 | 09/14/17 09:35 |
| 680-143024-24 | SB-2017-17-78-80 | Water | 09/13/17 12:20 | 09/14/17 09:35 |
| 680-143024-25 | SB-2017-18-72-74 | Water | 09/13/17 13:10 | 09/14/17 09:35 |
| 680-143024-26 | SB-2017-16-22-24 | Water | 09/13/17 14:30 | 09/14/17 09:35 |

# Method Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060 | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| M | Manual integrated compound. |
| D | The reported value is from a dilution. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| U | Undetected at the Limit of Detection. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-02-82-84 — Lab Sample ID: 680-143024-1

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 1.6 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 71000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 3700 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 190 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 210 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.7 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-05-82-84 — Lab Sample ID: 680-143024-2

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 2.8 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 52000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 3100 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 260 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 170 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.7 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-02-92-94 — Lab Sample ID: 680-143024-3

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 1.8 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 63000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 3800 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 1800 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 260 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 3.0 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-02-102-1044 — Lab Sample ID: 680-143024-4

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 3.2 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 65000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 8900 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 2400 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 280 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.7 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-05-92-94 — Lab Sample ID: 680-143024-5

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 4.8 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 64000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-05-92-94 (Continued) — Lab Sample ID: 680-143024-5

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Manganese | 3600 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 2500 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 250 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.5 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-02-111-113 — Lab Sample ID: 680-143024-6

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 2.2 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 53000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 5200 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 800 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 270 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.6 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: FD-07 — Lab Sample ID: 680-143024-7

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 1.9 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 76000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 3800 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 130 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 210 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.5 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-05-102-104 — Lab Sample ID: 680-143024-8

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 3.4 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 70000 | J | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 7500 | J | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 630 | J | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 250 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.4 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-17-12-14 — Lab Sample ID: 680-143024-9

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 13 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 8.2 | | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 4800 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 1600 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Alkalinity | 23 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.6 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-17-22-24 — Lab Sample ID: 680-143024-10

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 7.8 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 10 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 1600 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 420 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Alkalinity | 35 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 0.46 | J | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-17-32-34 — Lab Sample ID: 680-143024-11

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 420 | D | 5.0 | 5.0 | 2.0 | mg/L | 10 | | 9056A | Total/NA |
| Sulfate | 5.6 | | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 2600 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 660 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Alkalinity | 29 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 0.71 | J | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-17-42-44 — Lab Sample ID: 680-143024-12

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 490 | D | 13 | 13 | 5.0 | mg/L | 25 | | 9056A | Total/NA |
| Sulfate | 12 | | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 3900 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 710 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 10 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 37 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 0.91 | J | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-17-52-54 — Lab Sample ID: 680-143024-13

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 970 | D | 13 | 13 | 5.0 | mg/L | 25 | | 9056A | Total/NA |
| Sulfate | 15 | | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 10000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 860 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 57 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 54 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.3 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-05-112-114 — Lab Sample ID: 680-143024-14

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 16 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 3.5 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 34000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 12000 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 1100 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-05-112-114 (Continued) — Lab Sample ID: 680-143024-14

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 310 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.4 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-18-12-14 — Lab Sample ID: 680-143024-15

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 20 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 9.3 | | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 630 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 2800 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Alkalinity | 15 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.3 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-18-22-24 — Lab Sample ID: 680-143024-16

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 9.0 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 570 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 1900 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Alkalinity | 12 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.1 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-18-32-34 — Lab Sample ID: 680-143024-17

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.6 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 11 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 1500 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 1100 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Alkalinity | 27 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.4 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-18-42-44 — Lab Sample ID: 680-143024-18

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 3.8 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 6.7 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 930 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 690 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Alkalinity | 46 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 0.94 | J | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: FD-08 — Lab Sample ID: 680-143024-19

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.4 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: FD-08 (Continued) — Lab Sample ID: 680-143024-19

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 11 | | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 1100 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 1100 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Alkalinity | 26 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 0.68 | J | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-18-52-54 — Lab Sample ID: 680-143024-20

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.1 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 6.9 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 5500 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 1200 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 1.8 | J | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 58 | | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.5 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-17-62-64 — Lab Sample ID: 680-143024-21

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 69 | D | 1.0 | 1.0 | 0.40 | mg/L | 2 | | 9056A | Total/NA |
| Sulfate | 4.3 | | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 34000 | J | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 1500 | J | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 140 | J | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 92 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.3 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-17-72-74 — Lab Sample ID: 680-143024-22

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 27 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 2.8 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 80000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 3100 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 520 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 190 | | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.9 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-18-62-64 — Lab Sample ID: 680-143024-23

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 21 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 2.8 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 45000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 1400 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 200 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |

This Detection Summary does not include radiochemical test results.

## Client Sample ID: SB-2017-18-62-64 (Continued) — Lab Sample ID: 680-143024-23

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 140 | | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.6 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-17-78-80 — Lab Sample ID: 680-143024-24

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 35 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 4.7 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 36000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 5100 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 93 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 310 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 3.1 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-18-72-74 — Lab Sample ID: 680-143024-25

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 4.3 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 44000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 1600 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 250 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 200 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.2 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-16-22-24 — Lab Sample ID: 680-143024-26

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 240 | D | 5.0 | 5.0 | 2.0 | mg/L | 10 | | 9056A | Total/NA |
| Sulfate | 10 | | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 17000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 470 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 440 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 75 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.7 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

This Detection Summary does not include radiochemical test results.

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-02-82-84

**Lab Sample ID: 680-143024-1**

**Date Collected: 09/11/17 09:40**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/16/17 22:05 | 1 |
| Sulfate | 1.6 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/16/17 22:05 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 71000 | | 50 | 50 | 17 | ug/L | | 09/20/17 15:14 | 1 |
| Manganese | 3700 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 15:14 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 190 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 22:32 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 210 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 18:17 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.7 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 18:23 | 1 |

## Client Sample ID: SB-2017-05-82-84

**Lab Sample ID: 680-143024-2**

**Date Collected: 09/11/17 10:25**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/16/17 22:57 | 1 |
| Sulfate | 2.8 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/16/17 22:57 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 52000 | | 50 | 50 | 17 | ug/L | | 09/20/17 15:00 | 1 |
| Manganese | 3100 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 15:00 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 260 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 22:11 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 170 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 19:01 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.7 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 19:13 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-02-92-94

**Lab Sample ID: 680-143024-3**

**Date Collected: 09/11/17 11:35**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/16/17 23:32 | 1 |
| Sulfate | 1.8 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/16/17 23:32 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 63000 | | 50 | 50 | 17 | ug/L | | 09/20/17 14:55 | 1 |
| Manganese | 3800 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 14:55 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1800 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 22:06 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 260 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 18:11 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.0 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 19:30 | 1 |

## Client Sample ID: SB-2017-02-102-1044

**Lab Sample ID: 680-143024-4**

**Date Collected: 09/11/17 13:10**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/16/17 23:49 | 1 |
| Sulfate | 3.2 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/16/17 23:49 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 65000 | | 50 | 50 | 17 | ug/L | | 09/20/17 15:19 | 1 |
| Manganese | 8900 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 15:19 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2400 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 22:36 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 280 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 18:51 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.7 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 19:48 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-05-92-94

**Lab Sample ID: 680-143024-5**

**Date Collected: 09/11/17 12:10**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/17/17 00:41 | 1 |
| Sulfate | 4.8 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/17/17 00:41 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 64000 | | 50 | 50 | 17 | ug/L | | 09/18/17 20:22 | 1 |
| Manganese | 3600 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 20:22 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2500 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 19:44 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 250 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 18:45 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.5 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 20:05 | 1 |

## Client Sample ID: SB-2017-02-111-113

**Lab Sample ID: 680-143024-6**

**Date Collected: 09/11/17 15:50**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/17/17 00:59 | 1 |
| Sulfate | 2.2 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/17/17 00:59 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 53000 | | 50 | 50 | 17 | ug/L | | 09/18/17 20:40 | 1 |
| Manganese | 5200 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 20:40 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 800 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 19:52 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 270 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 18:05 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.6 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 20:56 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: FD-07

**Lab Sample ID: 680-143024-7**

**Date Collected: 09/11/17 09:45**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/17/17 01:16 | 1 |
| Sulfate | 1.9 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/17/17 01:16 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 76000 | | 50 | 50 | 17 | ug/L | | 09/20/17 14:50 | 1 |
| Manganese | 3800 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 14:50 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 130 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 22:02 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 210 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 18:22 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.5 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 21:12 | 1 |

## Client Sample ID: SB-2017-05-102-104

**Lab Sample ID: 680-143024-8**

**Date Collected: 09/11/17 12:15**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/17/17 01:34 | 1 |
| Sulfate | 3.4 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/17/17 01:34 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 70000 | J | 50 | 50 | 17 | ug/L | | 09/20/17 14:18 | 1 |
| Manganese | 7500 | J | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 14:18 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 630 | J | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 21:41 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 250 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 17:59 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.4 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 21:31 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-17-12-14

**Lab Sample ID: 680-143024-9**

**Date Collected: 09/12/17 09:35**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 13 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/17/17 01:51 | 1 |
| Sulfate | 8.2 | | 1.0 | 1.0 | 0.40 | mg/L | | 09/17/17 01:51 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 4800 | | 50 | 50 | 17 | ug/L | | 09/18/17 19:16 | 1 |
| Manganese | 1600 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 19:16 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 18:35 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 23 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 17:34 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.6 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 21:50 | 1 |

## Client Sample ID: SB-2017-17-22-24

**Lab Sample ID: 680-143024-10**

**Date Collected: 09/12/17 11:00**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 7.8 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 13:46 | 1 |
| Sulfate | 10 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 13:46 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 1600 | | 50 | 50 | 17 | ug/L | | 09/18/17 19:30 | 1 |
| Manganese | 420 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 19:30 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 18:56 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 35 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 19:28 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.46 | J | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 22:34 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-17-32-34

**Lab Sample ID: 680-143024-11**

**Date Collected: 09/12/17 12:40**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 420 | D | 5.0 | 5.0 | 2.0 | mg/L | | 09/20/17 13:26 | 10 |
| Sulfate | 5.6 | | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 14:39 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 2600 | | 50 | 50 | 17 | ug/L | | 09/18/17 19:07 | 1 |
| Manganese | 660 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 19:07 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 18:26 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 29 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/19/17 19:06 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.71 | J | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 22:49 | 1 |

## Client Sample ID: SB-2017-17-42-44

**Lab Sample ID: 680-143024-12**

**Date Collected: 09/12/17 14:30**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 490 | D | 13 | 13 | 5.0 | mg/L | | 09/20/17 14:01 | 25 |
| Sulfate | 12 | | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 14:56 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 3900 | | 50 | 50 | 17 | ug/L | | 09/18/17 20:26 | 1 |
| Manganese | 710 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 20:26 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 10 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 19:48 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 37 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 17:49 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.91 | J | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 23:08 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-17-52-54

**Lab Sample ID: 680-143024-13**

**Date Collected: 09/12/17 16:00**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 970 | D | 13 | 13 | 5.0 | mg/L | | 09/20/17 14:18 | 25 |
| Sulfate | 15 | | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 15:13 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 10000 | | 50 | 50 | 17 | ug/L | | 09/18/17 19:21 | 1 |
| Manganese | 860 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 19:21 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 57 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 18:48 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 54 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 17:54 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.3 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 23:24 | 1 |

## Client Sample ID: SB-2017-05-112-114

**Lab Sample ID: 680-143024-14**

**Date Collected: 09/12/17 09:40**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 16 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 15:31 | 1 |
| Sulfate | 3.5 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 15:31 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 34000 | | 50 | 50 | 17 | ug/L | | 09/18/17 19:25 | 1 |
| Manganese | 12000 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 19:25 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1100 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 18:52 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 310 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 18:56 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.4 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 23:43 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-18-12-14

**Lab Sample ID: 680-143024-15**

**Date Collected: 09/12/17 12:50**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 20 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 16:06 | 1 |
| Sulfate | 9.3 | | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 16:06 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 630 | | 50 | 50 | 17 | ug/L | | 09/18/17 19:11 | 1 |
| Manganese | 2800 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 19:11 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 18:31 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 15 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 18:39 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.3 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 00:48 | 1 |

## Client Sample ID: SB-2017-18-22-24

**Lab Sample ID: 680-143024-16**

**Date Collected: 09/12/17 13:50**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 16:23 | 1 |
| Sulfate | 9.0 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 16:23 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 570 | | 50 | 50 | 17 | ug/L | | 09/20/17 15:04 | 1 |
| Manganese | 1900 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 15:04 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 22:24 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 12 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 17:44 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.1 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 01:07 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-18-32-34

**Lab Sample ID: 680-143024-17**

**Date Collected: 09/12/17 15:20**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.6 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 17:15 | 1 |
| Sulfate | 11 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 17:15 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 1500 | | 50 | 50 | 17 | ug/L | | 09/18/17 19:53 | 1 |
| Manganese | 1100 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 19:53 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 19:09 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 27 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 16:58 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.4 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 01:56 | 1 |

## Client Sample ID: SB-2017-18-42-44

**Lab Sample ID: 680-143024-18**

**Date Collected: 09/12/17 17:00**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 3.8 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 17:33 | 1 |
| Sulfate | 6.7 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 17:33 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 930 | | 50 | 50 | 17 | ug/L | | 09/18/17 19:58 | 1 |
| Manganese | 690 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 19:58 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 19:14 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 46 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 17:03 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.94 | J | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 02:14 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: FD-08

**Lab Sample ID: 680-143024-19**

**Date Collected: 09/12/17 15:25**
**Date Received: 09/14/17 09:35**
**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.4 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 17:50 | 1 |
| Sulfate | 11 | | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 17:50 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 1100 | | 50 | 50 | 17 | ug/L | | 09/18/17 20:03 | 1 |
| Manganese | 1100 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 20:03 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 19:18 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 26 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 16:53 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.68 | J | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 02:29 | 1 |

## Client Sample ID: SB-2017-18-52-54

**Lab Sample ID: 680-143024-20**

**Date Collected: 09/13/17 09:35**
**Date Received: 09/14/17 09:35**
**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.1 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 18:08 | 1 |
| Sulfate | 6.9 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 18:08 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 5500 | | 50 | 50 | 17 | ug/L | | 09/20/17 15:09 | 1 |
| Manganese | 1200 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 15:09 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.8 | J | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 22:28 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 58 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 14:53 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.5 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 02:46 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-17-62-64

**Lab Sample ID: 680-143024-21**

**Date Collected: 09/13/17 09:30**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 69 | D | 1.0 | 1.0 | 0.40 | mg/L | | 09/20/17 12:34 | 2 |
| Sulfate | 4.3 | | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 18:25 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 34000 | J | 50 | 50 | 17 | ug/L | | 09/18/17 18:34 | 1 |
| Manganese | 1500 | J | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 18:34 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 140 | J | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 18:05 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 92 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 19:07 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.3 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 03:03 | 1 |

## Client Sample ID: SB-2017-17-72-74

**Lab Sample ID: 680-143024-22**

**Date Collected: 09/13/17 11:00**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 27 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 19:17 | 1 |
| Sulfate | 2.8 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 19:17 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 80000 | | 50 | 50 | 17 | ug/L | | 09/18/17 19:49 | 1 |
| Manganese | 3100 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 19:49 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 520 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 19:05 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 190 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 14:58 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.9 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 03:49 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-18-62-64

**Lab Sample ID: 680-143024-23**

**Date Collected: 09/13/17 11:35**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 21 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 19:35 | 1 |
| Sulfate | 2.8 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 19:35 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 45000 | | 50 | 50 | 17 | ug/L | | 09/18/17 20:17 | 1 |
| Manganese | 1400 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 20:17 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 200 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 19:40 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 140 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 15:04 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.6 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 04:06 | 1 |

## Client Sample ID: SB-2017-17-78-80

**Lab Sample ID: 680-143024-24**

**Date Collected: 09/13/17 12:20**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 35 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 19:52 | 1 |
| Sulfate | 4.7 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 19:52 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 36000 | | 50 | 50 | 17 | ug/L | | 09/18/17 20:12 | 1 |
| Manganese | 5100 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 20:12 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 93 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 19:27 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 310 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 19:18 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.1 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 04:22 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-18-72-74

**Lab Sample ID: 680-143024-25**

**Date Collected: 09/13/17 13:10**

**Matrix: Water**

**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 20:44 | 1 |
| Sulfate | 4.3 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 20:44 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 44000 | | 50 | 50 | 17 | ug/L | | 09/18/17 19:44 | 1 |
| Manganese | 1600 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 19:44 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 250 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 19:01 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 19:12 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.2 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 05:13 | 1 |

## Client Sample ID: SB-2017-16-22-24

**Lab Sample ID: 680-143024-26**

**Date Collected: 09/13/17 14:30**

**Matrix: Water**

**Date Received: 09/14/17 09:35**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 240 | D | 5.0 | 5.0 | 2.0 | mg/L | | 09/20/17 14:36 | 10 |
| Sulfate | 10 | | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 21:19 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17000 | | 50 | 50 | 17 | ug/L | | 09/18/17 20:07 | 1 |
| Manganese | 470 | | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 20:07 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 440 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 19:22 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 75 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 19:23 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.7 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 05:30 | 1 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-494948/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494948**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 09/16/17 10:53 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 09/16/17 10:53 | 1 |

**Lab Sample ID: LCS 680-494948/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494948**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.78 | | mg/L | | 98 | 87 - 111 |
| Sulfate | 10.0 | 9.73 | | mg/L | | 97 | 87 - 112 |

**Lab Sample ID: LCSD 680-494948/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494948**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.80 | | mg/L | | 98 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 9.77 | | mg/L | | 98 | 87 - 112 | 0 | 15 |

**Lab Sample ID: 680-143024-1 MS** — **Client Sample ID: SB-2017-02-82-84**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494948**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18 | | 10.0 | 27.9 | | mg/L | | 103 | 87 - 111 |
| Sulfate | 1.6 | M | 10.0 | 11.0 | M | mg/L | | 95 | 87 - 112 |

**Lab Sample ID: 680-143024-1 MSD** — **Client Sample ID: SB-2017-02-82-84**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494948**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18 | | 10.0 | 28.1 | | mg/L | | 104 | 87 - 111 | 1 | 15 |
| Sulfate | 1.6 | M | 10.0 | 11.2 | M | mg/L | | 97 | 87 - 112 | 2 | 15 |

**Lab Sample ID: 680-143024-2 DU** — **Client Sample ID: SB-2017-05-82-84**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 494948**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | | 13.9 | | mg/L | | 0.09 | 15 |
| Sulfate | 2.8 | M | 2.83 | M | mg/L | | 0 | 15 |

**Lab Sample ID: MB 680-495178/11** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495178**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 12:54 | 1 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: MB 680-495178/11** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495178**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 12:54 | 1 |

**Lab Sample ID: LCS 680-495178/12** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495178**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.71 | | mg/L | | 97 | 87 - 111 |
| Sulfate | 10.0 | 10.2 | | mg/L | | 102 | 87 - 112 |

**Lab Sample ID: LCSD 680-495178/13** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495178**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.72 | | mg/L | | 97 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 | 0 | 15 |

**Lab Sample ID: 680-143024-10 MS** — **Client Sample ID: SB-2017-17-22-24**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495178**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 7.8 | | 10.0 | 17.8 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10 | M | 10.0 | 19.9 | | mg/L | | 99 | 87 - 112 |

**Lab Sample ID: 680-143024-10 MSD** — **Client Sample ID: SB-2017-17-22-24**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495178**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 7.8 | | 10.0 | 17.9 | | mg/L | | 101 | 87 - 111 | 0 | 15 |
| Sulfate | 10 | M | 10.0 | 20.0 | | mg/L | | 100 | 87 - 112 | 0 | 15 |

**Lab Sample ID: 680-143024-21 MS** — **Client Sample ID: SB-2017-17-62-64**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495178**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 4.3 | | 10.0 | 14.5 | | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: 680-143024-21 MSD** — **Client Sample ID: SB-2017-17-62-64**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495178**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 4.3 | | 10.0 | 14.5 | | mg/L | | 102 | 87 - 112 | 0 | 15 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: 680-143024-14 DU** — **Client Sample ID: SB-2017-05-112-114**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495178**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Chloride | 16 | | 16.2 | | mg/L | | 0.5 | 15 |
| Sulfate | 3.5 | M | 3.49 | M | mg/L | | 0.4 | 15 |

**Lab Sample ID: 680-143024-25 DU** — **Client Sample ID: SB-2017-18-72-74**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495178**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 17.0 | | mg/L | | 0 | 15 |
| Sulfate | 4.3 | M | 4.33 | M | mg/L | | 0.2 | 15 |

**Lab Sample ID: MB 680-495310/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495310**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 09/20/17 09:44 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 09/20/17 09:44 | 1 |

**Lab Sample ID: LCS 680-495310/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495310**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.99 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 10.6 | | mg/L | | 106 | 87 - 112 |

**Lab Sample ID: LCSD 680-495310/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495310**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.99 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.6 | | mg/L | | 106 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-143024-21 MS** — **Client Sample ID: SB-2017-17-62-64**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495310**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 69 | D | 20.0 | 89.4 | D | mg/L | | 103 | 87 - 111 |

**Lab Sample ID: 680-143024-21 MSD** — **Client Sample ID: SB-2017-17-62-64**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495310**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 69 | D | 20.0 | 89.2 | D | mg/L | | 102 | 87 - 111 | 0 | 15 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: 680-143024-11 DU** — **Client Sample ID: SB-2017-17-32-34**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495310**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Chloride | 420 | D | 423 | D | mg/L | | 0.8 | 15 |
| Sulfate | 10 | U | 10 | U | mg/L | | NC | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-494901/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495230** — **Prep Batch: 494901**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 09/18/17 18:22 | 1 |
| Manganese | 3.0 | U | 10 | 3.0 | 1.0 | ug/L | | 09/18/17 18:22 | 1 |

**Lab Sample ID: LCS 680-494901/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495230** — **Prep Batch: 494901**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 5030 | | ug/L | | 101 | 87 - 115 |
| Manganese | 500 | 536 | | ug/L | | 107 | 90 - 114 |

**Lab Sample ID: MB 680-495054/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495534** — **Prep Batch: 495054**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 09/20/17 14:08 | 1 |
| Manganese | 3.0 | U | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 14:08 | 1 |

**Lab Sample ID: LCS 680-495054/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495534** — **Prep Batch: 495054**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 5290 | | ug/L | | 106 | 87 - 115 |
| Manganese | 500 | 543 | | ug/L | | 109 | 90 - 114 |

**Lab Sample ID: 680-143024-21 MS** — **Client Sample ID: SB-2017-17-62-64**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495230** — **Prep Batch: 494901**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 34000 | J | 5000 | 38100 | 4 | ug/L | | 80 | 87 - 115 |
| Manganese | 1500 | J | 500 | 2070 | | ug/L | | 113 | 90 - 114 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 680-143024-21 MSD** — **Client Sample ID: SB-2017-17-62-64**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495230** — **Prep Batch: 494901**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 34000 | J | 5000 | 37700 | 4 | ug/L | | 73 | 87 - 115 | 1 | 20 |
| Manganese | 1500 | J | 500 | 1880 | J | ug/L | | 75 | 90 - 114 | 10 | 20 |

**Lab Sample ID: 680-143024-8 MS** — **Client Sample ID: SB-2017-05-102-104**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495534** — **Prep Batch: 495054**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 70000 | J | 5000 | 73500 | 4 | ug/L | | 77 | 87 - 115 |
| Manganese | 7500 | J | 500 | 7850 | 4 | ug/L | | 76 | 90 - 114 |

**Lab Sample ID: 680-143024-8 MSD** — **Client Sample ID: SB-2017-05-102-104**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495534** — **Prep Batch: 495054**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 70000 | J | 5000 | 71800 | 4 | ug/L | | 44 | 87 - 115 | 2 | 20 |
| Manganese | 7500 | J | 500 | 7670 | 4 | ug/L | | 39 | 90 - 114 | 2 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-494899/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495330** — **Prep Batch: 494899**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 17:56 | 1 |

**Lab Sample ID: LCS 680-494899/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495330** — **Prep Batch: 494899**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 106 | | ug/L | | 106 | 84 - 116 |

**Lab Sample ID: MB 680-495052/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495330** — **Prep Batch: 495052**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/19/17 21:32 | 1 |

**Lab Sample ID: LCS 680-495052/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495330** — **Prep Batch: 495052**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 108 | | ug/L | | 108 | 84 - 116 |

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: 680-143024-21 MS** — **Client Sample ID: SB-2017-17-62-64**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495330** — **Prep Batch: 494899**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 140 | J | 100 | 242 | | ug/L | | 103 | 84 - 116 | | |

**Lab Sample ID: 680-143024-21 MSD** — **Client Sample ID: SB-2017-17-62-64**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495330** — **Prep Batch: 494899**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 140 | J | 100 | 228 | | ug/L | | 88 | 84 - 116 | 6 | 20 |

**Lab Sample ID: 680-143024-8 MS** — **Client Sample ID: SB-2017-05-102-104**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495330** — **Prep Batch: 495052**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 630 | J | 100 | 793 | 4 | ug/L | | 166 | 84 - 116 | | |

**Lab Sample ID: 680-143024-8 MSD** — **Client Sample ID: SB-2017-05-102-104**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495330** — **Prep Batch: 495052**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 630 | J | 100 | 711 | 4 | ug/L | | 84 | 84 - 116 | 11 | 20 |

## Method: 9060 - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-388294/35** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388294**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 00:15 | 1 |

**Lab Sample ID: MB 280-388294/4** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388294**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 09/19/17 15:24 | 1 |

**Lab Sample ID: LCS 280-388294/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388294**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | | | 25.0 | 23.6 | | mg/L | | 95 | 88 - 112 | | |

## Method: 9060 - Organic Carbon, Dissolved (DOC) (Continued)

**Lab Sample ID: LCS 280-388294/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388294**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 25.0 | 24.1 | | mg/L | | 96 | 88 - 112 |

**Lab Sample ID: 680-143024-5 MS** — **Client Sample ID: SB-2017-05-92-94**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388294**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.5 | | 25.0 | 26.0 | | mg/L | | 94 | 88 - 112 |

**Lab Sample ID: 680-143024-5 MSD** — **Client Sample ID: SB-2017-05-92-94**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388294**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.5 | | 25.0 | 25.9 | | mg/L | | 93 | 88 - 112 | 0 | 15 |

**Lab Sample ID: 680-143024-21 MS** — **Client Sample ID: SB-2017-17-62-64**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388294**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.3 | | 25.0 | 25.4 | | mg/L | | 97 | 88 - 112 |

**Lab Sample ID: 680-143024-21 MSD** — **Client Sample ID: SB-2017-17-62-64**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388294**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.3 | | 25.0 | 25.2 | | mg/L | | 96 | 88 - 112 | 1 | 15 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-387954/30** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387954**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.00 | J | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 17:29 | 1 |

**Lab Sample ID: MB 280-387954/5** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387954**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.45 | J | 5.0 | 3.2 | 1.1 | mg/L | | 09/15/17 15:07 | 1 |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: LCS 280-387954/29** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387954**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 190 | | mg/L | | 95 | 90 - 110 |

**Lab Sample ID: LCS 280-387954/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387954**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 194 | | mg/L | | 97 | 90 - 110 |

**Lab Sample ID: 680-143024-9 DU** — **Client Sample ID: SB-2017-17-12-14**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 387954**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Alkalinity | 23 | B | 22.7 | | mg/L | | 0.4 | 10 |

**Lab Sample ID: MB 280-388215/31** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 388215**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 2.58 | J | 5.0 | 3.2 | 1.1 | mg/L | | 09/19/17 18:24 | 1 |

**Lab Sample ID: LCS 280-388215/30** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 388215**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 183 | | mg/L | | 92 | 90 - 110 |

**Lab Sample ID: MB 280-388592/31** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 388592**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 2.32 | J | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 14:05 | 1 |

**Lab Sample ID: LCS 280-388592/30** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 388592**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 186 | | mg/L | | 93 | 90 - 110 |

## HPLC/IC

### Analysis Batch: 494948

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-1 | SB-2017-02-82-84 | Total/NA | Water | 9056A | |
| 680-143024-2 | SB-2017-05-82-84 | Total/NA | Water | 9056A | |
| 680-143024-3 | SB-2017-02-92-94 | Total/NA | Water | 9056A | |
| 680-143024-4 | SB-2017-02-102-1044 | Total/NA | Water | 9056A | |
| 680-143024-5 | SB-2017-05-92-94 | Total/NA | Water | 9056A | |
| 680-143024-6 | SB-2017-02-111-113 | Total/NA | Water | 9056A | |
| 680-143024-7 | FD-07 | Total/NA | Water | 9056A | |
| 680-143024-8 | SB-2017-05-102-104 | Total/NA | Water | 9056A | |
| 680-143024-9 | SB-2017-17-12-14 | Total/NA | Water | 9056A | |
| MB 680-494948/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-494948/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-494948/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-143024-1 MS | SB-2017-02-82-84 | Total/NA | Water | 9056A | |
| 680-143024-1 MSD | SB-2017-02-82-84 | Total/NA | Water | 9056A | |
| 680-143024-2 DU | SB-2017-05-82-84 | Total/NA | Water | 9056A | |

### Analysis Batch: 495178

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-10 | SB-2017-17-22-24 | Total/NA | Water | 9056A | |
| 680-143024-11 | SB-2017-17-32-34 | Total/NA | Water | 9056A | |
| 680-143024-12 | SB-2017-17-42-44 | Total/NA | Water | 9056A | |
| 680-143024-13 | SB-2017-17-52-54 | Total/NA | Water | 9056A | |
| 680-143024-14 | SB-2017-05-112-114 | Total/NA | Water | 9056A | |
| 680-143024-15 | SB-2017-18-12-14 | Total/NA | Water | 9056A | |
| 680-143024-16 | SB-2017-18-22-24 | Total/NA | Water | 9056A | |
| 680-143024-17 | SB-2017-18-32-34 | Total/NA | Water | 9056A | |
| 680-143024-18 | SB-2017-18-42-44 | Total/NA | Water | 9056A | |
| 680-143024-19 | FD-08 | Total/NA | Water | 9056A | |
| 680-143024-20 | SB-2017-18-52-54 | Total/NA | Water | 9056A | |
| 680-143024-21 | SB-2017-17-62-64 | Total/NA | Water | 9056A | |
| 680-143024-22 | SB-2017-17-72-74 | Total/NA | Water | 9056A | |
| 680-143024-23 | SB-2017-18-62-64 | Total/NA | Water | 9056A | |
| 680-143024-24 | SB-2017-17-78-80 | Total/NA | Water | 9056A | |
| 680-143024-25 | SB-2017-18-72-74 | Total/NA | Water | 9056A | |
| 680-143024-26 | SB-2017-16-22-24 | Total/NA | Water | 9056A | |
| MB 680-495178/11 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-495178/12 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-495178/13 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-143024-10 MS | SB-2017-17-22-24 | Total/NA | Water | 9056A | |
| 680-143024-10 MSD | SB-2017-17-22-24 | Total/NA | Water | 9056A | |
| 680-143024-21 MS | SB-2017-17-62-64 | Total/NA | Water | 9056A | |
| 680-143024-21 MSD | SB-2017-17-62-64 | Total/NA | Water | 9056A | |
| 680-143024-14 DU | SB-2017-05-112-114 | Total/NA | Water | 9056A | |
| 680-143024-25 DU | SB-2017-18-72-74 | Total/NA | Water | 9056A | |

### Analysis Batch: 495310

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-11 | SB-2017-17-32-34 | Total/NA | Water | 9056A | |
| 680-143024-12 | SB-2017-17-42-44 | Total/NA | Water | 9056A | |
| 680-143024-13 | SB-2017-17-52-54 | Total/NA | Water | 9056A | |
| 680-143024-21 | SB-2017-17-62-64 | Total/NA | Water | 9056A | |

## HPLC/IC (Continued)

### Analysis Batch: 495310 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-26 | SB-2017-16-22-24 | Total/NA | Water | 9056A | |
| MB 680-495310/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-495310/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-495310/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-143024-21 MS | SB-2017-17-62-64 | Total/NA | Water | 9056A | |
| 680-143024-21 MSD | SB-2017-17-62-64 | Total/NA | Water | 9056A | |
| 680-143024-11 DU | SB-2017-17-32-34 | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 494899

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-5 | SB-2017-05-92-94 | Dissolved | Water | 3005A | |
| 680-143024-6 | SB-2017-02-111-113 | Dissolved | Water | 3005A | |
| 680-143024-9 | SB-2017-17-12-14 | Dissolved | Water | 3005A | |
| 680-143024-10 | SB-2017-17-22-24 | Dissolved | Water | 3005A | |
| 680-143024-11 | SB-2017-17-32-34 | Dissolved | Water | 3005A | |
| 680-143024-12 | SB-2017-17-42-44 | Dissolved | Water | 3005A | |
| 680-143024-13 | SB-2017-17-52-54 | Dissolved | Water | 3005A | |
| 680-143024-14 | SB-2017-05-112-114 | Dissolved | Water | 3005A | |
| 680-143024-15 | SB-2017-18-12-14 | Dissolved | Water | 3005A | |
| 680-143024-17 | SB-2017-18-32-34 | Dissolved | Water | 3005A | |
| 680-143024-18 | SB-2017-18-42-44 | Dissolved | Water | 3005A | |
| 680-143024-19 | FD-08 | Dissolved | Water | 3005A | |
| 680-143024-21 | SB-2017-17-62-64 | Dissolved | Water | 3005A | |
| 680-143024-22 | SB-2017-17-72-74 | Dissolved | Water | 3005A | |
| 680-143024-23 | SB-2017-18-62-64 | Dissolved | Water | 3005A | |
| 680-143024-24 | SB-2017-17-78-80 | Dissolved | Water | 3005A | |
| 680-143024-25 | SB-2017-18-72-74 | Dissolved | Water | 3005A | |
| 680-143024-26 | SB-2017-16-22-24 | Dissolved | Water | 3005A | |
| MB 680-494899/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-494899/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-143024-21 MS | SB-2017-17-62-64 | Dissolved | Water | 3005A | |
| 680-143024-21 MSD | SB-2017-17-62-64 | Dissolved | Water | 3005A | |

### Prep Batch: 494901

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-5 | SB-2017-05-92-94 | Dissolved | Water | 3005A | |
| 680-143024-6 | SB-2017-02-111-113 | Dissolved | Water | 3005A | |
| 680-143024-9 | SB-2017-17-12-14 | Dissolved | Water | 3005A | |
| 680-143024-10 | SB-2017-17-22-24 | Dissolved | Water | 3005A | |
| 680-143024-11 | SB-2017-17-32-34 | Dissolved | Water | 3005A | |
| 680-143024-12 | SB-2017-17-42-44 | Dissolved | Water | 3005A | |
| 680-143024-13 | SB-2017-17-52-54 | Dissolved | Water | 3005A | |
| 680-143024-14 | SB-2017-05-112-114 | Dissolved | Water | 3005A | |
| 680-143024-15 | SB-2017-18-12-14 | Dissolved | Water | 3005A | |
| 680-143024-17 | SB-2017-18-32-34 | Dissolved | Water | 3005A | |
| 680-143024-18 | SB-2017-18-42-44 | Dissolved | Water | 3005A | |
| 680-143024-19 | FD-08 | Dissolved | Water | 3005A | |
| 680-143024-21 | SB-2017-17-62-64 | Dissolved | Water | 3005A | |

## Metals (Continued)

### Prep Batch: 494901 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-22 | SB-2017-17-72-74 | Dissolved | Water | 3005A | |
| 680-143024-23 | SB-2017-18-62-64 | Dissolved | Water | 3005A | |
| 680-143024-24 | SB-2017-17-78-80 | Dissolved | Water | 3005A | |
| 680-143024-25 | SB-2017-18-72-74 | Dissolved | Water | 3005A | |
| 680-143024-26 | SB-2017-16-22-24 | Dissolved | Water | 3005A | |
| MB 680-494901/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-494901/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-143024-21 MS | SB-2017-17-62-64 | Dissolved | Water | 3005A | |
| 680-143024-21 MSD | SB-2017-17-62-64 | Dissolved | Water | 3005A | |

### Prep Batch: 495052

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-1 | SB-2017-02-82-84 | Dissolved | Water | 3005A | |
| 680-143024-2 | SB-2017-05-82-84 | Dissolved | Water | 3005A | |
| 680-143024-3 | SB-2017-02-92-94 | Dissolved | Water | 3005A | |
| 680-143024-4 | SB-2017-02-102-1044 | Dissolved | Water | 3005A | |
| 680-143024-7 | FD-07 | Dissolved | Water | 3005A | |
| 680-143024-8 | SB-2017-05-102-104 | Dissolved | Water | 3005A | |
| 680-143024-16 | SB-2017-18-22-24 | Dissolved | Water | 3005A | |
| 680-143024-20 | SB-2017-18-52-54 | Dissolved | Water | 3005A | |
| MB 680-495052/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-495052/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-143024-8 MS | SB-2017-05-102-104 | Dissolved | Water | 3005A | |
| 680-143024-8 MSD | SB-2017-05-102-104 | Dissolved | Water | 3005A | |

### Prep Batch: 495054

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-1 | SB-2017-02-82-84 | Dissolved | Water | 3005A | |
| 680-143024-2 | SB-2017-05-82-84 | Dissolved | Water | 3005A | |
| 680-143024-3 | SB-2017-02-92-94 | Dissolved | Water | 3005A | |
| 680-143024-4 | SB-2017-02-102-1044 | Dissolved | Water | 3005A | |
| 680-143024-7 | FD-07 | Dissolved | Water | 3005A | |
| 680-143024-8 | SB-2017-05-102-104 | Dissolved | Water | 3005A | |
| 680-143024-16 | SB-2017-18-22-24 | Dissolved | Water | 3005A | |
| 680-143024-20 | SB-2017-18-52-54 | Dissolved | Water | 3005A | |
| MB 680-495054/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-495054/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-143024-8 MS | SB-2017-05-102-104 | Dissolved | Water | 3005A | |
| 680-143024-8 MSD | SB-2017-05-102-104 | Dissolved | Water | 3005A | |

### Analysis Batch: 495230

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-5 | SB-2017-05-92-94 | Dissolved | Water | 6010C | 494901 |
| 680-143024-6 | SB-2017-02-111-113 | Dissolved | Water | 6010C | 494901 |
| 680-143024-9 | SB-2017-17-12-14 | Dissolved | Water | 6010C | 494901 |
| 680-143024-10 | SB-2017-17-22-24 | Dissolved | Water | 6010C | 494901 |
| 680-143024-11 | SB-2017-17-32-34 | Dissolved | Water | 6010C | 494901 |
| 680-143024-12 | SB-2017-17-42-44 | Dissolved | Water | 6010C | 494901 |
| 680-143024-13 | SB-2017-17-52-54 | Dissolved | Water | 6010C | 494901 |
| 680-143024-14 | SB-2017-05-112-114 | Dissolved | Water | 6010C | 494901 |
| 680-143024-15 | SB-2017-18-12-14 | Dissolved | Water | 6010C | 494901 |

## Metals (Continued)

### Analysis Batch: 495230 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-17 | SB-2017-18-32-34 | Dissolved | Water | 6010C | 494901 |
| 680-143024-18 | SB-2017-18-42-44 | Dissolved | Water | 6010C | 494901 |
| 680-143024-19 | FD-08 | Dissolved | Water | 6010C | 494901 |
| 680-143024-21 | SB-2017-17-62-64 | Dissolved | Water | 6010C | 494901 |
| 680-143024-22 | SB-2017-17-72-74 | Dissolved | Water | 6010C | 494901 |
| 680-143024-23 | SB-2017-18-62-64 | Dissolved | Water | 6010C | 494901 |
| 680-143024-24 | SB-2017-17-78-80 | Dissolved | Water | 6010C | 494901 |
| 680-143024-25 | SB-2017-18-72-74 | Dissolved | Water | 6010C | 494901 |
| 680-143024-26 | SB-2017-16-22-24 | Dissolved | Water | 6010C | 494901 |
| MB 680-494901/1-A | Method Blank | Total Recoverable | Water | 6010C | 494901 |
| LCS 680-494901/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 494901 |
| 680-143024-21 MS | SB-2017-17-62-64 | Dissolved | Water | 6010C | 494901 |
| 680-143024-21 MSD | SB-2017-17-62-64 | Dissolved | Water | 6010C | 494901 |

### Analysis Batch: 495330

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-1 | SB-2017-02-82-84 | Dissolved | Water | 6020A | 495052 |
| 680-143024-2 | SB-2017-05-82-84 | Dissolved | Water | 6020A | 495052 |
| 680-143024-3 | SB-2017-02-92-94 | Dissolved | Water | 6020A | 495052 |
| 680-143024-4 | SB-2017-02-102-1044 | Dissolved | Water | 6020A | 495052 |
| 680-143024-5 | SB-2017-05-92-94 | Dissolved | Water | 6020A | 494899 |
| 680-143024-6 | SB-2017-02-111-113 | Dissolved | Water | 6020A | 494899 |
| 680-143024-7 | FD-07 | Dissolved | Water | 6020A | 495052 |
| 680-143024-8 | SB-2017-05-102-104 | Dissolved | Water | 6020A | 495052 |
| 680-143024-9 | SB-2017-17-12-14 | Dissolved | Water | 6020A | 494899 |
| 680-143024-10 | SB-2017-17-22-24 | Dissolved | Water | 6020A | 494899 |
| 680-143024-11 | SB-2017-17-32-34 | Dissolved | Water | 6020A | 494899 |
| 680-143024-12 | SB-2017-17-42-44 | Dissolved | Water | 6020A | 494899 |
| 680-143024-13 | SB-2017-17-52-54 | Dissolved | Water | 6020A | 494899 |
| 680-143024-14 | SB-2017-05-112-114 | Dissolved | Water | 6020A | 494899 |
| 680-143024-15 | SB-2017-18-12-14 | Dissolved | Water | 6020A | 494899 |
| 680-143024-16 | SB-2017-18-22-24 | Dissolved | Water | 6020A | 495052 |
| 680-143024-17 | SB-2017-18-32-34 | Dissolved | Water | 6020A | 494899 |
| 680-143024-18 | SB-2017-18-42-44 | Dissolved | Water | 6020A | 494899 |
| 680-143024-19 | FD-08 | Dissolved | Water | 6020A | 494899 |
| 680-143024-20 | SB-2017-18-52-54 | Dissolved | Water | 6020A | 495052 |
| 680-143024-21 | SB-2017-17-62-64 | Dissolved | Water | 6020A | 494899 |
| 680-143024-22 | SB-2017-17-72-74 | Dissolved | Water | 6020A | 494899 |
| 680-143024-23 | SB-2017-18-62-64 | Dissolved | Water | 6020A | 494899 |
| 680-143024-24 | SB-2017-17-78-80 | Dissolved | Water | 6020A | 494899 |
| 680-143024-25 | SB-2017-18-72-74 | Dissolved | Water | 6020A | 494899 |
| 680-143024-26 | SB-2017-16-22-24 | Dissolved | Water | 6020A | 494899 |
| MB 680-494899/1-A | Method Blank | Total Recoverable | Water | 6020A | 494899 |
| MB 680-495052/1-A | Method Blank | Total Recoverable | Water | 6020A | 495052 |
| LCS 680-494899/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 494899 |
| LCS 680-495052/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 495052 |
| 680-143024-8 MS | SB-2017-05-102-104 | Dissolved | Water | 6020A | 495052 |
| 680-143024-8 MSD | SB-2017-05-102-104 | Dissolved | Water | 6020A | 495052 |
| 680-143024-21 MS | SB-2017-17-62-64 | Dissolved | Water | 6020A | 494899 |
| 680-143024-21 MSD | SB-2017-17-62-64 | Dissolved | Water | 6020A | 494899 |

## Metals (Continued)

### Analysis Batch: 495534

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-1 | SB-2017-02-82-84 | Dissolved | Water | 6010C | 495054 |
| 680-143024-2 | SB-2017-05-82-84 | Dissolved | Water | 6010C | 495054 |
| 680-143024-3 | SB-2017-02-92-94 | Dissolved | Water | 6010C | 495054 |
| 680-143024-4 | SB-2017-02-102-1044 | Dissolved | Water | 6010C | 495054 |
| 680-143024-7 | FD-07 | Dissolved | Water | 6010C | 495054 |
| 680-143024-8 | SB-2017-05-102-104 | Dissolved | Water | 6010C | 495054 |
| 680-143024-16 | SB-2017-18-22-24 | Dissolved | Water | 6010C | 495054 |
| 680-143024-20 | SB-2017-18-52-54 | Dissolved | Water | 6010C | 495054 |
| MB 680-495054/1-A | Method Blank | Total Recoverable | Water | 6010C | 495054 |
| LCS 680-495054/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 495054 |
| 680-143024-8 MS | SB-2017-05-102-104 | Dissolved | Water | 6010C | 495054 |
| 680-143024-8 MSD | SB-2017-05-102-104 | Dissolved | Water | 6010C | 495054 |

## General Chemistry

### Analysis Batch: 387954

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-1 | SB-2017-02-82-84 | Total/NA | Water | SM 2320B | |
| 680-143024-2 | SB-2017-05-82-84 | Total/NA | Water | SM 2320B | |
| 680-143024-3 | SB-2017-02-92-94 | Total/NA | Water | SM 2320B | |
| 680-143024-4 | SB-2017-02-102-1044 | Total/NA | Water | SM 2320B | |
| 680-143024-5 | SB-2017-05-92-94 | Total/NA | Water | SM 2320B | |
| 680-143024-6 | SB-2017-02-111-113 | Total/NA | Water | SM 2320B | |
| 680-143024-7 | FD-07 | Total/NA | Water | SM 2320B | |
| 680-143024-8 | SB-2017-05-102-104 | Total/NA | Water | SM 2320B | |
| 680-143024-9 | SB-2017-17-12-14 | Total/NA | Water | SM 2320B | |
| 680-143024-10 | SB-2017-17-22-24 | Total/NA | Water | SM 2320B | |
| 680-143024-12 | SB-2017-17-42-44 | Total/NA | Water | SM 2320B | |
| 680-143024-13 | SB-2017-17-52-54 | Total/NA | Water | SM 2320B | |
| 680-143024-14 | SB-2017-05-112-114 | Total/NA | Water | SM 2320B | |
| 680-143024-15 | SB-2017-18-12-14 | Total/NA | Water | SM 2320B | |
| 680-143024-16 | SB-2017-18-22-24 | Total/NA | Water | SM 2320B | |
| 680-143024-17 | SB-2017-18-32-34 | Total/NA | Water | SM 2320B | |
| 680-143024-18 | SB-2017-18-42-44 | Total/NA | Water | SM 2320B | |
| 680-143024-19 | FD-08 | Total/NA | Water | SM 2320B | |
| 680-143024-21 | SB-2017-17-62-64 | Total/NA | Water | SM 2320B | |
| 680-143024-24 | SB-2017-17-78-80 | Total/NA | Water | SM 2320B | |
| 680-143024-25 | SB-2017-18-72-74 | Total/NA | Water | SM 2320B | |
| 680-143024-26 | SB-2017-16-22-24 | Total/NA | Water | SM 2320B | |
| MB 280-387954/30 | Method Blank | Total/NA | Water | SM 2320B | |
| MB 280-387954/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-387954/29 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| LCS 280-387954/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 680-143024-9 DU | SB-2017-17-12-14 | Total/NA | Water | SM 2320B | |

### Analysis Batch: 388215

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-11 | SB-2017-17-32-34 | Total/NA | Water | SM 2320B | |
| MB 280-388215/31 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-388215/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |

## General Chemistry (Continued)

### Analysis Batch: 388294

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-1 | SB-2017-02-82-84 | Dissolved | Water | 9060 | |
| 680-143024-2 | SB-2017-05-82-84 | Dissolved | Water | 9060 | |
| 680-143024-3 | SB-2017-02-92-94 | Dissolved | Water | 9060 | |
| 680-143024-4 | SB-2017-02-102-1044 | Dissolved | Water | 9060 | |
| 680-143024-5 | SB-2017-05-92-94 | Dissolved | Water | 9060 | |
| 680-143024-6 | SB-2017-02-111-113 | Dissolved | Water | 9060 | |
| 680-143024-7 | FD-07 | Dissolved | Water | 9060 | |
| 680-143024-8 | SB-2017-05-102-104 | Dissolved | Water | 9060 | |
| 680-143024-9 | SB-2017-17-12-14 | Dissolved | Water | 9060 | |
| 680-143024-10 | SB-2017-17-22-24 | Dissolved | Water | 9060 | |
| 680-143024-11 | SB-2017-17-32-34 | Dissolved | Water | 9060 | |
| 680-143024-12 | SB-2017-17-42-44 | Dissolved | Water | 9060 | |
| 680-143024-13 | SB-2017-17-52-54 | Dissolved | Water | 9060 | |
| 680-143024-14 | SB-2017-05-112-114 | Dissolved | Water | 9060 | |
| 680-143024-15 | SB-2017-18-12-14 | Dissolved | Water | 9060 | |
| 680-143024-16 | SB-2017-18-22-24 | Dissolved | Water | 9060 | |
| 680-143024-17 | SB-2017-18-32-34 | Dissolved | Water | 9060 | |
| 680-143024-18 | SB-2017-18-42-44 | Dissolved | Water | 9060 | |
| 680-143024-19 | FD-08 | Dissolved | Water | 9060 | |
| 680-143024-20 | SB-2017-18-52-54 | Dissolved | Water | 9060 | |
| 680-143024-21 | SB-2017-17-62-64 | Dissolved | Water | 9060 | |
| 680-143024-22 | SB-2017-17-72-74 | Dissolved | Water | 9060 | |
| 680-143024-23 | SB-2017-18-62-64 | Dissolved | Water | 9060 | |
| 680-143024-24 | SB-2017-17-78-80 | Dissolved | Water | 9060 | |
| 680-143024-25 | SB-2017-18-72-74 | Dissolved | Water | 9060 | |
| 680-143024-26 | SB-2017-16-22-24 | Dissolved | Water | 9060 | |
| MB 280-388294/35 | Method Blank | Dissolved | Water | 9060 | |
| MB 280-388294/4 | Method Blank | Dissolved | Water | 9060 | |
| LCS 280-388294/3 | Lab Control Sample | Dissolved | Water | 9060 | |
| LCS 280-388294/34 | Lab Control Sample | Dissolved | Water | 9060 | |
| 680-143024-5 MS | SB-2017-05-92-94 | Dissolved | Water | 9060 | |
| 680-143024-5 MSD | SB-2017-05-92-94 | Dissolved | Water | 9060 | |
| 680-143024-21 MS | SB-2017-17-62-64 | Dissolved | Water | 9060 | |
| 680-143024-21 MSD | SB-2017-17-62-64 | Dissolved | Water | 9060 | |

### Analysis Batch: 388592

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143024-20 | SB-2017-18-52-54 | Total/NA | Water | SM 2320B | |
| 680-143024-22 | SB-2017-17-72-74 | Total/NA | Water | SM 2320B | |
| 680-143024-23 | SB-2017-18-62-64 | Total/NA | Water | SM 2320B | |
| MB 280-388592/31 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-388592/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-02-82-84

**Lab Sample ID: 680-143024-1**

**Date Collected: 09/11/17 09:40**

**Matrix: Water**

**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494948 | 09/16/17 22:05 | ALR | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495054 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 15:14 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495052 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 22:32 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/19/17 18:23 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 18:17 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-05-82-84

**Lab Sample ID: 680-143024-2**

**Date Collected: 09/11/17 10:25**

**Matrix: Water**

**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494948 | 09/16/17 22:57 | ALR | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495054 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 15:00 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495052 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 22:11 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/19/17 19:13 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 19:01 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-02-92-94

**Lab Sample ID: 680-143024-3**

**Date Collected: 09/11/17 11:35**

**Matrix: Water**

**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494948 | 09/16/17 23:32 | ALR | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495054 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 14:55 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495052 | 09/18/17 11:09 | AJR | TAL SAV |

## Client Sample ID: SB-2017-02-92-94 — Lab Sample ID: 680-143024-3

**Date Collected: 09/11/17 11:35** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 22:06 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/19/17 19:30 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 18:11 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-02-102-1044 — Lab Sample ID: 680-143024-4

**Date Collected: 09/11/17 13:10** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494948 | 09/16/17 23:49 | ALR | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495054 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 15:19 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495052 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 22:36 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/19/17 19:48 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 18:51 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-05-92-94 — Lab Sample ID: 680-143024-5

**Date Collected: 09/11/17 12:10** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494948 | 09/17/17 00:41 | ALR | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 20:22 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 19:44 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/19/17 20:05 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 18:45 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-02-111-113

**Lab Sample ID: 680-143024-6**

**Date Collected: 09/11/17 15:50**

**Matrix: Water**

**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494948 | 09/17/17 00:59 | ALR | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 20:40 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 19:52 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/19/17 20:56 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 18:05 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: FD-07

**Lab Sample ID: 680-143024-7**

**Date Collected: 09/11/17 09:45**

**Matrix: Water**

**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494948 | 09/17/17 01:16 | ALR | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495054 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 14:50 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495052 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 22:02 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/19/17 21:12 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 18:22 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-05-102-104

**Lab Sample ID: 680-143024-8**

**Date Collected: 09/11/17 12:15**

**Matrix: Water**

**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494948 | 09/17/17 01:34 | ALR | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495054 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 14:18 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495052 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 21:41 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/19/17 21:31 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 17:59 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-17-12-14 — Lab Sample ID: 680-143024-9

**Date Collected: 09/12/17 09:35** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 494948 | 09/17/17 01:51 | ALR | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 19:16 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 18:35 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/19/17 21:50 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 17:34 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-17-22-24 — Lab Sample ID: 680-143024-10

**Date Collected: 09/12/17 11:00** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 13:46 | ALR | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 19:30 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 18:56 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/19/17 22:34 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 19:28 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-17-32-34 — Lab Sample ID: 680-143024-11

**Date Collected: 09/12/17 12:40** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 14:39 | ALR | TAL SAV |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Client Sample ID: SB-2017-17-32-34

**Lab Sample ID: 680-143024-11**

**Date Collected: 09/12/17 12:40**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 14:39 | ALR | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Total/NA | Analysis | 9056A | | 10 | 5 mL | 5 mL | 495310 | 09/20/17 13:26 | ALR | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 19:07 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 18:26 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/19/17 22:49 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388215 | 09/19/17 19:06 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-17-42-44

**Lab Sample ID: 680-143024-12**

**Date Collected: 09/12/17 14:30**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 14:56 | ALR | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Total/NA | Analysis | 9056A | | 25 | 5 mL | 5 mL | 495310 | 09/20/17 14:01 | ALR | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 20:26 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 19:48 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/19/17 23:08 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 17:49 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-17-52-54

**Lab Sample ID: 680-143024-13**

**Date Collected: 09/12/17 16:00**
**Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 15:13 | ALR | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |

## Client Sample ID: SB-2017-17-52-54 — Lab Sample ID: 680-143024-13

**Date Collected: 09/12/17 16:00** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 25 | 5 mL | 5 mL | 495310 | 09/20/17 14:18 | ALR | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 19:21 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 18:48 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/19/17 23:24 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 17:54 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-05-112-114 — Lab Sample ID: 680-143024-14

**Date Collected: 09/12/17 09:40** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 15:31 | ALR | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 19:25 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 18:52 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/19/17 23:43 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 18:56 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-18-12-14 — Lab Sample ID: 680-143024-15

**Date Collected: 09/12/17 12:50** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 16:06 | ALR | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 19:11 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 18:31 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 00:48 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 18:39 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-18-22-24 — Lab Sample ID: 680-143024-16

**Date Collected: 09/12/17 13:50** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 16:23 | ALR | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495054 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 15:04 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495052 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 22:24 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 01:07 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 17:44 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-18-32-34 — Lab Sample ID: 680-143024-17

**Date Collected: 09/12/17 15:20** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 17:15 | ALR | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 19:53 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 19:09 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 01:56 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 16:58 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-18-42-44 — Lab Sample ID: 680-143024-18

**Date Collected: 09/12/17 17:00** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 17:33 | ALR | TAL SAV |

## Client Sample ID: SB-2017-18-42-44

**Lab Sample ID: 680-143024-18**

**Date Collected: 09/12/17 17:00**

**Matrix: Water**

**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 17:33 | ALR | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 19:58 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 19:14 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 02:14 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 17:03 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: FD-08

**Lab Sample ID: 680-143024-19**

**Date Collected: 09/12/17 15:25**

**Matrix: Water**

**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 17:50 | ALR | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 20:03 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 19:18 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 02:29 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 16:53 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-18-52-54

**Lab Sample ID: 680-143024-20**

**Date Collected: 09/13/17 09:35**

**Matrix: Water**

**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 18:08 | ALR | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495054 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 15:09 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495052 | 09/18/17 11:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 22:28 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 02:46 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388592 | 09/21/17 14:53 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-17-62-64

**Lab Sample ID: 680-143024-21**

**Date Collected: 09/13/17 09:30**

**Matrix: Water**

**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 18:25 | ALR | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Total/NA | Analysis | 9056A | | 2 | 5 mL | 5 mL | 495310 | 09/20/17 12:34 | ALR | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 18:34 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 18:05 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 03:03 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 19:07 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-17-72-74

**Lab Sample ID: 680-143024-22**

**Date Collected: 09/13/17 11:00**

**Matrix: Water**

**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 19:17 | ALR | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 19:49 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 19:05 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 03:49 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388592 | 09/21/17 14:58 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-18-62-64 — Lab Sample ID: 680-143024-23

**Date Collected: 09/13/17 11:35** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 19:35 | ALR | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 20:17 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 19:40 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 04:06 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388592 | 09/21/17 15:04 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-17-78-80 — Lab Sample ID: 680-143024-24

**Date Collected: 09/13/17 12:20** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 19:52 | ALR | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 20:12 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 19:27 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 04:22 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 19:18 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-18-72-74 — Lab Sample ID: 680-143024-25

**Date Collected: 09/13/17 13:10** — **Matrix: Water**
**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 20:44 | ALR | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 19:44 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 19:01 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 05:13 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 19:12 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-16-22-24

## Lab Sample ID: 680-143024-26

**Date Collected: 09/13/17 14:30**

**Matrix: Water**

**Date Received: 09/14/17 09:35**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495178 | 09/19/17 21:19 | ALR | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Total/NA | Analysis | 9056A | | 10 | 5 mL | 5 mL | 495310 | 09/20/17 14:36 | ALR | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 494901 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495230 | 09/18/17 20:07 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 494899 | 09/15/17 12:52 | BJB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/19/17 19:22 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 05:30 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 387954 | 09/15/17 19:23 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: of:

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation

Sampler(s) Signature(s)

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-02-82-84 | 9-11-17 | 0940 | GW | 4 | x | x | x | x | | |
| SB-2017-05-82-84 | 9-11-17 | 1025 | GW | 4 | x | x | x | x | | |
| SB-2017-02-92-94 | 9-11-17 | 1135 | GW | 4 | x | x | x | x | | |
| SB-2017-02-102-104 | 9-11-17 | 1310 | GW | 4 | x | x | x | x | | |
| SB-2017-05-92-94 | 9-11-17 | 1210 | GW | 4 | x | x | x | x | | |
| SB-2017-02-111-113 | 9-11-17 | 1550 | GW | 4 | x | x | x | x | | |
| FD-07 | 9-11-17 | 0945 | GW | 4 | x | x | x | x | | |
| SB-2017-05-102-104 | 9-11-17 | 1215 | GW | 4 | x | x | x | x | | |

680-143024 Chain of Custody

Shipping Details: courier pick up ← Total Number of Containers

Date Out: Via:
Returned: Via:
Additional Comments:
* = Dissolved Metals include: Fe, Mn (6010); As (6020)

| Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|
| | Kurt Hall KGS | 9-13-17 | 1435 | [signature] | 9-13-17 | 1435 |
| | [signature] | 9-13-17 | 1800 | [signature] | 9-14-17 | 935 |

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐
On ICE ☐

Temperature 38/4.1 0/0.2 C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

MATRIX CODES: GW = Groundwa SE = Sediment SP = Soil SW = Surface Water W = Water (Blanks) O = Other
PRESERVATIVE CODES: H = HCL + Ice I = Ice Only N = Nitric Acid + Ice S = Sulfuric Acid + Ice M = Methanol O = Other
COLLECTION METHOD CODES: C = Composite G=Grab P= Pumping O = Other

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 | **Chain of Custody Record** | Page: | of: |
|---|---|---|---|---|---|

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation
Lynne Klosterman

Sampler(s) Signature(s)
Lynne Klosterman

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017- 17-12-14 | 9/12/17 | 0935 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017- 17-22-24 | 9/12/17 | 1100 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017- 17-32-34 | 9/12/17 | 1240 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017- 17-42-44 | 9/12/17 | 1430 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017- 17-52-54 | 9/12/17 | 1600 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017- | | | GW | | | | | | | | | | | | | |

Shipping Details courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | Kevin Hallas /KGS | 9-13-17 | 1435 | | [signature] | 9-13-17 | 1435 |
| Additional Comments: | | | [signature] | 9-13-17 | 1800 | | [signature] | 9-14-17 | 935 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal # _____

Preserve Where Applicable ☐
On ICE ☐

Temperature 38/41 0.2/05

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: of:

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation

Sampler(s) Signature(s)

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-05-112-114 | 9-12-17 | 0940 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-18-12-14 | 9-12-17 | 1250 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-18-22-24 | 9-12-17 | 1350 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-18-32-34 | 9-12-17 | 1520 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-18-42-44 | 9-12-17 | 1700 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017- | | | GW | | | | | | | | | | | | | |
| FD-08 | 9-12-17 | 1525 | GW | 4 | x | x | x | x | | | | | | | | |

Shipping Details courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | Kaz Haley | 9-13-17 | 1435 | | [signature] | 9-13-17 | 1435 |
| Additional Comments: | | | [signature] | 9-13-17 | 1800 | | [signature] | 9-14-17 | 935 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal # _____

Preserve Where Applicable ☐
On ICE ☐

Temperature 38/41 02/06

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: ___ of: ___

KOMAN Government Solutions, LLC

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Sampler(s) Signature(s)

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-18-52-54 | 9-13-17 | 0935 | GW | 4 | X | X | X | X | | |
| SB-2017-17-62-64 | 9-13-17 | 0930 | GW | 12 | X | X | X | X | MS/MSD 935/940 | |
| SB-2017-17-72-74 | 9-13-17 | 1100 | GW | 4 | X | X | X | X | | |
| SB-2017-18-62-64 | 9-13-17 | 1135 | GW | 4 | X | X | X | X | | |
| SB-2017-17-78-80 | 9-13-17 | 1220 | GW | 4 | X | X | X | X | | |
| SB-2017-18-72-74 | 9-13-17 | 1310 | GW | 4 | X | X | X | X | | |
| SB-2017-K-22-24 | 9-13-17 | 1430 | GW | 4 | X | X | X | X | | |

Shipping Details: courier pick up

← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | Kevin Hallas KGS | 9-13-17 | 1435 | | 9-13-17 | 1435 |
| Additional Comments: | | | | 9-13-17 | 1840 | | 9-14-17 | 935 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:

lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐

On ICE ☐

Temperature 38/41 0240

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

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KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

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Sampled by [Print Name(s)]/Affilliation

Sampler(s) Signature(s)

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-18-52-54 | 9-13-17 | 0935 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-17-62-64 | 9-13-17 | 0930 | GW | 12 | x | x | x | x | | | | | | | MS/MSD 935/940 | |
| SB-2017-17-72-74 | 9-13-17 | 1100 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-18-62-64 | 9-13-17 | 1135 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-17-78-80 | 9-13-17 | 1220 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-18-72-74 | 9-13-17 | 1310 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-16-22-24 | 9-13-17 | 1430 | GW | 4 | x | x | x | x | | | | | | | | |

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | Kevin Hallas KGS | 9-13-17 | 1435 | | [signature] | 9-13-17 | 1435 |
| Additional Comments: | | | [signature] | 9-13-17 | 1840 | | [signature] | 9-14-17 | 0850 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐
On ICE ☐

IR#7 +0.1
Temperature 0.1, 2.4, 0.5C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

680-143024 Chain of Custody

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: of:

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation
Lynne Klosterman

Sampler(s) Signature(s)
Lynne Klosterman

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017- 17-12-14 | 9/12/17 | 0935 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017- 17-22-24 | 9/12/17 | 1100 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017- 17-32-34 | 9/12/17 | 1240 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017- 17-42-44 | 9/12/17 | 1430 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017- 17-52-54 | 9/12/17 | 1600 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017- | | | GW | | | | | | | | | | | | | |

Shipping Details courier pick up ← Total Number of Containers

| Date Out: Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Returned: Via: | | [signature] /KGS | 9-13-17 | 1435 | | [signature] | 9-13-17 | 1435 |
| Additional Comments: | | [signature] | 9-13-17 | 1800 | | [signature] | 9-14-17 | 0850 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal # _____

Preserve Where Applicable ☐
On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: ___ of: ___

KOMAN Government Solutions, LLC

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Sampled by [Print Name(s)]/Affiliation

Sampler(s) Signature(s)

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N | I | I | S | S | I | O | S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-05-112-114 | 9-12-17 | 0940 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017-18-12-14 | 9-12-17 | 1250 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017-18-22-24 | 9-12-17 | 1350 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017-18-32-34 | 9-12-17 | 1520 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017-18-42-44 | 9-12-17 | 1700 | GW | 4 | X | X | X | X | | | | | | | | |
| SB-2017- | | | GW | | | | | | | | | | | | | |
| FD-08 | 9-12-17 | 1525 | GW | 4 | X | X | X | X | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | Mark Hanley | 9-13-17 | 1435 | | [illegible] | 9-13-17 | 1435 |
| Additional Comments: | | | [illegible] | 9-13-17 | 1800 | | [illegible] | 9-14-17 | 0850 |
| * = Dissolved Metals include: Fe, Mn (6010); As (6020) | | | | | | | | | |

email logins and results to:

lekes@komangs.com

**Lab Comments**

Seal # _____ Preserve Where Applicable ☐ On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | |
|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: ___ of: ___

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affiliation

Sampler(s) Signature(s)

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-02-82-84 | 9-11-17 | 0940 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-05-82-84 | 9-11-17 | 1025 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-02-92-94 | 9-11-17 | 1135 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-02-102-104 | 9-11-17 | 1310 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-05-92-94 | 9-11-17 | 1210 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-02-111-113 | 9-11-17 | 1550 | GW | 4 | x | x | x | x | | | | | | | | |
| FD-07 | 9-11-17 | 0945 | GW | 4 | x | x | x | x | | | | | | | | |
| SB-2017-05-102-104 | 9-11-17 | 1215 | GW | 4 | x | x | x | x | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Returned: Via: | | [illegible] KGS | 9-13-17 | 1735 | | [illegible] | 9-13-17 | 1735 |
| Additional Comments: | | [illegible] | 9-13-17 | 1800 | | [illegible] | 9-14-17 | 0850 |
| * = Dissolved Metals include: Fe, Mn (6010C); As (6020) | | | | | | | | |

email logins and results to:

lekes@komangs.com

**Lab Comments**

Seal # _____

Preserve Where Applicable ☐
On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

# Login Sample Receipt Checklist

Client: KOMAN Government Solutions, LLC

Job Number: 680-143024-1

**Login Number: 143024**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: Ragnaldsen, Amy E**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | N/A | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: KOMAN Government Solutions, LLC

Job Number: 680-143024-1

**Login Number: 143024**
**List Number: 2**
**Creator: Pottruff, Reed W**

**List Source: TestAmerica Denver**
**List Creation: 09/14/17 06:40 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | False | Refer to Job Narrative for details. |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | False | Refer to Job Narrative for details. |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| | AFCEE | | SAVLAB | |
| Alabama | State Program | 4 | 41450 | 06-30-18 |
| Alaska | State Program | 10 | | 06-30-18 |
| Alaska (UST) | State Program | 10 | UST-104 | 11-05-17 * |
| Arizona | State Program | 9 | AZ808 | 12-14-17 |
| Arkansas DEQ | State Program | 6 | 88-0692 | 02-01-18 |
| California | State Program | 9 | 2939 | 06-30-17 * |
| Colorado | State Program | 8 | N/A | 12-31-17 |
| Connecticut | State Program | 1 | PH-0161 | 03-31-19 |
| Florida | NELAP | 4 | E87052 | 06-30-18 |
| GA Dept. of Agriculture | State Program | 4 | N/A | 06-12-18 |
| Georgia | State Program | 4 | 803 | 06-30-18 |
| Guam | State Program | 9 | 15-005r | 04-16-18 |
| Hawaii | State Program | 9 | N/A | 06-30-18 |
| Illinois | NELAP | 5 | 200022 | 11-30-17 |
| Indiana | State Program | 5 | N/A | 06-30-18 |
| Iowa | State Program | 7 | 353 | 06-30-19 |
| Kentucky (DW) | State Program | 4 | 90084 | 12-31-17 |
| Kentucky (UST) | State Program | 4 | 18 | 06-30-18 |
| Kentucky (WW) | State Program | 4 | 90084 | 12-31-17 |
| L-A-B | DoD ELAP | | L2463 | 09-22-19 |
| L-A-B | ISO/IEC 17025 | | L2463.01 | 09-22-19 |
| Louisiana | NELAP | 6 | 30690 | 06-30-18 |
| Louisiana (DW) | NELAP | 6 | LA160019 | 12-31-17 |
| Maine | State Program | 1 | GA00006 | 09-24-18 |
| Maryland | State Program | 3 | 250 | 12-31-17 |
| Massachusetts | State Program | 1 | M-GA006 | 06-30-18 |
| Michigan | State Program | 5 | 9925 | 06-30-17 * |
| Mississippi | State Program | 4 | N/A | 06-30-18 |
| Nebraska | State Program | 7 | TestAmerica-Savannah | 06-30-18 |
| New Jersey | NELAP | 2 | GA769 | 06-30-18 |
| New Mexico | State Program | 6 | N/A | 06-30-18 |
| New York | NELAP | 2 | 10842 | 03-31-18 |
| North Carolina (DW) | State Program | 4 | 13701 | 07-31-18 |
| North Carolina (WW/SW) | State Program | 4 | 269 | 12-31-17 |
| Oklahoma | State Program | 6 | 9984 | 08-31-18 |
| Pennsylvania | NELAP | 3 | 68-00474 | 06-30-18 |
| Puerto Rico | State Program | 2 | GA00006 | 12-31-17 |
| South Carolina | State Program | 4 | 98001 | 06-30-17 * |
| Tennessee | State Program | 4 | TN02961 | 06-30-18 |
| Texas | NELAP | 6 | T104704185-16-9 | 11-30-17 |
| Texas | State Program | 6 | T104704185 | 06-30-18 |
| US Fish & Wildlife | Federal | | LE058448-0 | 07-31-18 |
| USDA | Federal | | SAV 3-04 | 06-14-20 * |
| Virginia | NELAP | 3 | 460161 | 06-14-18 |
| Washington | State Program | 10 | C805 | 06-10-18 |
| West Virginia (DW) | State Program | 3 | 9950C | 12-31-17 |
| West Virginia DEP | State Program | 3 | 094 | 06-30-18 |
| Wisconsin | State Program | 5 | 999819810 | 08-31-18 |
| Wyoming | State Program | 8 | 8TMS-L | 06-30-16 * |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143024-1

## Laboratory: TestAmerica Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

TestAmerica Job ID: 680-142177-1
Client Project/Site: Devens - SHL EPA SOW Phase 1

For:
KOMAN Government Solutions, LLC
293 Boston Post Road
Suite 100
Marlborough, Massachusetts 01752

Attn: Laurie Ekes

*Authorized for release by:*
*8/29/2017 11:51:53 AM*

Jerry Lanier, Project Manager I
(912)354-7858 e.3410
jerry.lanier@testamericainc.com

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*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Job ID: 680-142177-1

**Laboratory: TestAmerica Savannah**

**Narrative**

# CASE NARRATIVE

## Client: KOMAN Government Solutions, LLC

## Project: Devens - SHL EPA SOW Phase 1

## Report Number: 680-142177-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 08/17/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.8º C and 2.4º C.

**METALS (ICP) - DISSOLVED**
Samples SB-2017-07-25-27 (680-142177-1), SB-2017-07-35-37 (680-142177-2), SB-2017-07-45-47 (680-142177-3), SB-2017-07-55-57 (680-142177-4), SB-2017-07-65-67 (680-142177-5) and SB-2017-07-75-77 (680-142177-6) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 08/18/2017 and 08/22/2017 and analyzed on 08/23/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples SB-2017-07-25-27 (680-142177-1), SB-2017-07-35-37 (680-142177-2), SB-2017-07-45-47 (680-142177-3), SB-2017-07-55-57 (680-142177-4), SB-2017-07-65-67 (680-142177-5) and SB-2017-07-75-77 (680-142177-6) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 08/18/2017 and 08/22/2017 and analyzed on 08/21/2017 and 08/23/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples SB-2017-07-25-27 (680-142177-1), SB-2017-07-35-37 (680-142177-2), SB-2017-07-45-47 (680-142177-3), SB-2017-07-55-57 (680-142177-4), SB-2017-07-65-67 (680-142177-5) and SB-2017-07-75-77 (680-142177-6) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 08/21/2017.

The method blank for method 2320B analytical batch 280-385068 contained alkalinity above the method detection limit (MDL). Associated sample(s) were not re-analyzed because results were greater than 10X the value found in the method blank.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**
Samples SB-2017-07-25-27 (680-142177-1), SB-2017-07-35-37 (680-142177-2), SB-2017-07-45-47 (680-142177-3), SB-2017-07-55-57 (680-142177-4), SB-2017-07-65-67 (680-142177-5) and SB-2017-07-75-77 (680-142177-6) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 08/24/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Job ID: 680-142177-1 (Continued)

### Laboratory: TestAmerica Savannah (Continued)

**DISSOLVED ORGANIC CARBON**

Samples SB-2017-07-25-27 (680-142177-1), SB-2017-07-35-37 (680-142177-2), SB-2017-07-45-47 (680-142177-3), SB-2017-07-55-57 (680-142177-4), SB-2017-07-65-67 (680-142177-5) and SB-2017-07-75-77 (680-142177-6) were analyzed for dissolved organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 08/19/2017 and 08/21/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142177-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 680-142177-1 | SB-2017-07-25-27 | Water | 08/15/17 11:05 | 08/17/17 09:15 |
| 680-142177-2 | SB-2017-07-35-37 | Water | 08/15/17 13:15 | 08/17/17 09:15 |
| 680-142177-3 | SB-2017-07-45-47 | Water | 08/15/17 15:20 | 08/17/17 09:15 |
| 680-142177-4 | SB-2017-07-55-57 | Water | 08/16/17 10:00 | 08/17/17 09:15 |
| 680-142177-5 | SB-2017-07-65-67 | Water | 08/16/17 12:10 | 08/17/17 09:15 |
| 680-142177-6 | SB-2017-07-75-77 | Water | 08/16/17 14:20 | 08/17/17 09:15 |

# Method Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142177-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060 | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142177-1

## Client Sample ID: SB-2017-07-25-27

**Lab Sample ID: 680-142177-1**

**Date Collected: 08/15/17 11:05**
**Matrix: Water**
**Date Received: 08/17/17 09:15**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.2 | | 0.50 | 0.50 | 0.20 | mg/L | | 08/24/17 09:48 | 1 |
| Sulfate | 3.4 | M | 1.0 | 1.0 | 0.40 | mg/L | | 08/24/17 09:48 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 7300 | | 50 | 50 | 17 | ug/L | | 08/23/17 02:37 | 1 |
| Manganese | 1900 | | 10 | 3.0 | 1.0 | ug/L | | 08/23/17 02:37 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 15 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/21/17 19:03 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 33 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/21/17 17:23 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.4 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/19/17 08:17 | 1 |

## Client Sample ID: SB-2017-07-35-37

**Lab Sample ID: 680-142177-2**

**Date Collected: 08/15/17 13:15**
**Matrix: Water**
**Date Received: 08/17/17 09:15**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.0 | | 0.50 | 0.50 | 0.20 | mg/L | | 08/24/17 10:40 | 1 |
| Sulfate | 4.6 | M | 1.0 | 1.0 | 0.40 | mg/L | | 08/24/17 10:40 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 500 | | 50 | 50 | 17 | ug/L | | 08/23/17 20:19 | 1 |
| Manganese | 2700 | | 10 | 3.0 | 1.0 | ug/L | | 08/23/17 20:19 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 08/23/17 16:03 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 62 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/21/17 16:08 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.5 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/19/17 08:32 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142177-1

## Client Sample ID: SB-2017-07-45-47

**Lab Sample ID: 680-142177-3**

**Date Collected: 08/15/17 15:20**
**Matrix: Water**
**Date Received: 08/17/17 09:15**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.1 | | 0.50 | 0.50 | 0.20 | mg/L | | 08/24/17 10:57 | 1 |
| Sulfate | 1.8 | M | 1.0 | 1.0 | 0.40 | mg/L | | 08/24/17 10:57 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 6800 | | 50 | 50 | 17 | ug/L | | 08/23/17 02:42 | 1 |
| Manganese | 1500 | | 10 | 3.0 | 1.0 | ug/L | | 08/23/17 02:42 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 33 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/21/17 19:14 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 79 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/21/17 17:18 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.1 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/21/17 16:45 | 1 |

## Client Sample ID: SB-2017-07-55-57

**Lab Sample ID: 680-142177-4**

**Date Collected: 08/16/17 10:00**
**Matrix: Water**
**Date Received: 08/17/17 09:15**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.6 | | 0.50 | 0.50 | 0.20 | mg/L | | 08/24/17 11:15 | 1 |
| Sulfate | 2.9 | M | 1.0 | 1.0 | 0.40 | mg/L | | 08/24/17 11:15 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 51000 | | 50 | 50 | 17 | ug/L | | 08/23/17 02:57 | 1 |
| Manganese | 2700 | | 10 | 3.0 | 1.0 | ug/L | | 08/23/17 02:57 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 270 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/21/17 19:17 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 77 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/21/17 17:28 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.6 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/21/17 17:00 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142177-1

## Client Sample ID: SB-2017-07-65-67

**Lab Sample ID: 680-142177-5**

**Date Collected: 08/16/17 12:10**
**Matrix: Water**
**Date Received: 08/17/17 09:15**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.4 | | 0.50 | 0.50 | 0.20 | mg/L | | 08/24/17 11:32 | 1 |
| Sulfate | 5.1 | M | 1.0 | 1.0 | 0.40 | mg/L | | 08/24/17 11:32 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 30000 | | 50 | 50 | 17 | ug/L | | 08/23/17 20:09 | 1 |
| Manganese | 1800 | | 10 | 3.0 | 1.0 | ug/L | | 08/23/17 20:09 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3000 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/23/17 15:55 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 45 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/21/17 17:33 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.75 | J | 1.0 | 0.50 | 0.16 | mg/L | | 08/21/17 17:46 | 1 |

## Client Sample ID: SB-2017-07-75-77

**Lab Sample ID: 680-142177-6**

**Date Collected: 08/16/17 14:20**
**Matrix: Water**
**Date Received: 08/17/17 09:15**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.4 | | 0.50 | 0.50 | 0.20 | mg/L | | 08/24/17 11:50 | 1 |
| Sulfate | 6.8 | M | 1.0 | 1.0 | 0.40 | mg/L | | 08/24/17 11:50 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 4300 | | 50 | 50 | 17 | ug/L | | 08/23/17 20:14 | 1 |
| Manganese | 2700 | | 10 | 3.0 | 1.0 | ug/L | | 08/23/17 20:14 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 400 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/23/17 15:59 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 85 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/21/17 16:13 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.64 | J | 1.0 | 0.50 | 0.16 | mg/L | | 08/21/17 18:01 | 1 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-492720/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 492720**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 08/24/17 08:38 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 08/24/17 08:38 | 1 |

**Lab Sample ID: LCS 680-492720/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 492720**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.94 | | mg/L | | 99 | 87 - 111 |
| Sulfate | 10.0 | 9.85 | | mg/L | | 98 | 87 - 112 |

**Lab Sample ID: LCSD 680-492720/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 492720**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.99 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 9.95 | | mg/L | | 100 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-142177-1 MS** — **Client Sample ID: SB-2017-07-25-27**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 492720**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.2 | | 10.0 | 11.5 | | mg/L | | 102 | 87 - 111 |
| Sulfate | 3.4 | M | 10.0 | 12.8 | M | mg/L | | 94 | 87 - 112 |

**Lab Sample ID: 680-142177-1 MSD** — **Client Sample ID: SB-2017-07-25-27**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 492720**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.2 | | 10.0 | 11.5 | | mg/L | | 103 | 87 - 111 | 1 | 15 |
| Sulfate | 3.4 | M | 10.0 | 12.8 | M | mg/L | | 94 | 87 - 112 | 0 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-492104/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 492595** — **Prep Batch: 492104**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 08/23/17 02:03 | 1 |
| Manganese | 3.0 | U | 10 | 3.0 | 1.0 | ug/L | | 08/23/17 02:03 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 680-492104/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 492595** — **Prep Batch: 492104**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 5140 | | ug/L | | 103 | 87 - 115 |
| Manganese | 500 | 568 | | ug/L | | 114 | 90 - 114 |

**Lab Sample ID: MB 680-492433/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 492781** — **Prep Batch: 492433**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 08/23/17 19:26 | 1 |
| Manganese | 3.0 | U | 10 | 3.0 | 1.0 | ug/L | | 08/23/17 19:26 | 1 |

**Lab Sample ID: LCS 680-492433/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 492781** — **Prep Batch: 492433**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4990 | | ug/L | | 100 | 87 - 115 |
| Manganese | 500 | 535 | | ug/L | | 107 | 90 - 114 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-492102/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 492392** — **Prep Batch: 492102**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 08/21/17 17:46 | 1 |

**Lab Sample ID: LCS 680-492102/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 492392** — **Prep Batch: 492102**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 103 | | ug/L | | 103 | 84 - 116 |

**Lab Sample ID: MB 680-492430/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 492728** — **Prep Batch: 492430**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 08/23/17 15:30 | 1 |

**Lab Sample ID: LCS 680-492430/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 492728** — **Prep Batch: 492430**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 102 | | ug/L | | 102 | 84 - 116 |

## Method: 9060 - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-384967/13** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 384967**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 08/18/17 16:49 | 1 |

**Lab Sample ID: MB 280-384967/46** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 384967**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 08/19/17 01:06 | 1 |

**Lab Sample ID: LCS 280-384967/12** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 384967**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 25.0 | 25.0 | | mg/L | | 100 | 88 - 112 |

**Lab Sample ID: LCS 280-384967/45** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 384967**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 25.0 | 25.1 | | mg/L | | 101 | 88 - 112 |

**Lab Sample ID: MB 280-385100/4** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 385100**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 08/21/17 14:24 | 1 |

**Lab Sample ID: LCS 280-385100/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 385100**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 25.0 | 23.6 | | mg/L | | 94 | 88 - 112 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-385068/31** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 385068**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 2.85 | J | 5.0 | 3.2 | 1.1 | mg/L | | 08/21/17 16:44 | 1 |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: MB 280-385068/5**
**Matrix: Water**
**Analysis Batch: 385068**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 2.90 | J | 5.0 | 3.2 | 1.1 | mg/L | | 08/21/17 14:09 | 1 |

**Lab Sample ID: LCS 280-385068/30**
**Matrix: Water**
**Analysis Batch: 385068**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 192 | | mg/L | | 96 | 90 - 110 | | |

**Lab Sample ID: LCS 280-385068/4**
**Matrix: Water**
**Analysis Batch: 385068**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 197 | | mg/L | | 98 | 90 - 110 | | |

# QC Association Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142177-1

## HPLC/IC

### Analysis Batch: 492720

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142177-1 | SB-2017-07-25-27 | Total/NA | Water | 9056A | |
| 680-142177-2 | SB-2017-07-35-37 | Total/NA | Water | 9056A | |
| 680-142177-3 | SB-2017-07-45-47 | Total/NA | Water | 9056A | |
| 680-142177-4 | SB-2017-07-55-57 | Total/NA | Water | 9056A | |
| 680-142177-5 | SB-2017-07-65-67 | Total/NA | Water | 9056A | |
| 680-142177-6 | SB-2017-07-75-77 | Total/NA | Water | 9056A | |
| MB 680-492720/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-492720/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-492720/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-142177-1 MS | SB-2017-07-25-27 | Total/NA | Water | 9056A | |
| 680-142177-1 MSD | SB-2017-07-25-27 | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 492102

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142177-1 | SB-2017-07-25-27 | Dissolved | Water | 3005A | |
| 680-142177-3 | SB-2017-07-45-47 | Dissolved | Water | 3005A | |
| 680-142177-4 | SB-2017-07-55-57 | Dissolved | Water | 3005A | |
| MB 680-492102/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-492102/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 492104

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142177-1 | SB-2017-07-25-27 | Dissolved | Water | 3005A | |
| 680-142177-3 | SB-2017-07-45-47 | Dissolved | Water | 3005A | |
| 680-142177-4 | SB-2017-07-55-57 | Dissolved | Water | 3005A | |
| MB 680-492104/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-492104/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Analysis Batch: 492392

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142177-1 | SB-2017-07-25-27 | Dissolved | Water | 6020A | 492102 |
| 680-142177-3 | SB-2017-07-45-47 | Dissolved | Water | 6020A | 492102 |
| 680-142177-4 | SB-2017-07-55-57 | Dissolved | Water | 6020A | 492102 |
| MB 680-492102/1-A | Method Blank | Total Recoverable | Water | 6020A | 492102 |
| LCS 680-492102/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 492102 |

### Prep Batch: 492430

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142177-2 | SB-2017-07-35-37 | Dissolved | Water | 3005A | |
| 680-142177-5 | SB-2017-07-65-67 | Dissolved | Water | 3005A | |
| 680-142177-6 | SB-2017-07-75-77 | Dissolved | Water | 3005A | |
| MB 680-492430/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-492430/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 492433

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142177-2 | SB-2017-07-35-37 | Dissolved | Water | 3005A | |
| 680-142177-5 | SB-2017-07-65-67 | Dissolved | Water | 3005A | |

## Metals (Continued)

### Prep Batch: 492433 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142177-6 | SB-2017-07-75-77 | Dissolved | Water | 3005A | |
| MB 680-492433/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-492433/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Analysis Batch: 492595

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142177-1 | SB-2017-07-25-27 | Dissolved | Water | 6010C | 492104 |
| 680-142177-3 | SB-2017-07-45-47 | Dissolved | Water | 6010C | 492104 |
| 680-142177-4 | SB-2017-07-55-57 | Dissolved | Water | 6010C | 492104 |
| MB 680-492104/1-A | Method Blank | Total Recoverable | Water | 6010C | 492104 |
| LCS 680-492104/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 492104 |

### Analysis Batch: 492728

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142177-2 | SB-2017-07-35-37 | Dissolved | Water | 6020A | 492430 |
| 680-142177-5 | SB-2017-07-65-67 | Dissolved | Water | 6020A | 492430 |
| 680-142177-6 | SB-2017-07-75-77 | Dissolved | Water | 6020A | 492430 |
| MB 680-492430/1-A | Method Blank | Total Recoverable | Water | 6020A | 492430 |
| LCS 680-492430/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 492430 |

### Analysis Batch: 492781

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142177-2 | SB-2017-07-35-37 | Dissolved | Water | 6010C | 492433 |
| 680-142177-5 | SB-2017-07-65-67 | Dissolved | Water | 6010C | 492433 |
| 680-142177-6 | SB-2017-07-75-77 | Dissolved | Water | 6010C | 492433 |
| MB 680-492433/1-A | Method Blank | Total Recoverable | Water | 6010C | 492433 |
| LCS 680-492433/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 492433 |

## General Chemistry

### Analysis Batch: 384967

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142177-1 | SB-2017-07-25-27 | Dissolved | Water | 9060 | |
| 680-142177-2 | SB-2017-07-35-37 | Dissolved | Water | 9060 | |
| MB 280-384967/13 | Method Blank | Dissolved | Water | 9060 | |
| MB 280-384967/46 | Method Blank | Dissolved | Water | 9060 | |
| LCS 280-384967/12 | Lab Control Sample | Dissolved | Water | 9060 | |
| LCS 280-384967/45 | Lab Control Sample | Dissolved | Water | 9060 | |

### Analysis Batch: 385068

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142177-1 | SB-2017-07-25-27 | Total/NA | Water | SM 2320B | |
| 680-142177-2 | SB-2017-07-35-37 | Total/NA | Water | SM 2320B | |
| 680-142177-3 | SB-2017-07-45-47 | Total/NA | Water | SM 2320B | |
| 680-142177-4 | SB-2017-07-55-57 | Total/NA | Water | SM 2320B | |
| 680-142177-5 | SB-2017-07-65-67 | Total/NA | Water | SM 2320B | |
| 680-142177-6 | SB-2017-07-75-77 | Total/NA | Water | SM 2320B | |
| MB 280-385068/31 | Method Blank | Total/NA | Water | SM 2320B | |
| MB 280-385068/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-385068/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |

## General Chemistry (Continued)

### Analysis Batch: 385068 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 280-385068/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Analysis Batch: 385100

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142177-3 | SB-2017-07-45-47 | Dissolved | Water | 9060 | |
| 680-142177-4 | SB-2017-07-55-57 | Dissolved | Water | 9060 | |
| 680-142177-5 | SB-2017-07-65-67 | Dissolved | Water | 9060 | |
| 680-142177-6 | SB-2017-07-75-77 | Dissolved | Water | 9060 | |
| MB 280-385100/4 | Method Blank | Dissolved | Water | 9060 | |
| LCS 280-385100/3 | Lab Control Sample | Dissolved | Water | 9060 | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142177-1

## Client Sample ID: SB-2017-07-25-27

**Lab Sample ID: 680-142177-1**

**Date Collected: 08/15/17 11:05**

**Matrix: Water**

**Date Received: 08/17/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 492720 | 08/24/17 09:48 | CJM | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 492104 | 08/18/17 11:07 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 492595 | 08/23/17 02:37 | BCB | TAL SAV |
| | Instrument ID: | ICPF | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 492102 | 08/18/17 11:07 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 492392 | 08/21/17 19:03 | BWR | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 384967 | 08/19/17 08:17 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 385068 | 08/21/17 17:23 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-07-35-37

**Lab Sample ID: 680-142177-2**

**Date Collected: 08/15/17 13:15**

**Matrix: Water**

**Date Received: 08/17/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 492720 | 08/24/17 10:40 | CJM | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 492433 | 08/22/17 10:33 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 492781 | 08/23/17 20:19 | BCB | TAL SAV |
| | Instrument ID: | ICPF | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 492430 | 08/22/17 10:33 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 492728 | 08/23/17 16:03 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 384967 | 08/19/17 08:32 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 385068 | 08/21/17 16:08 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-07-45-47

**Lab Sample ID: 680-142177-3**

**Date Collected: 08/15/17 15:20**

**Matrix: Water**

**Date Received: 08/17/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 492720 | 08/24/17 10:57 | CJM | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 492104 | 08/18/17 11:07 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 492595 | 08/23/17 02:42 | BCB | TAL SAV |
| | Instrument ID: | ICPF | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 492102 | 08/18/17 11:07 | AJR | TAL SAV |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142177-1

## Client Sample ID: SB-2017-07-45-47

**Lab Sample ID: 680-142177-3**

**Date Collected: 08/15/17 15:20**
**Matrix: Water**
**Date Received: 08/17/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 6020A | | 1 | | | 492392 | 08/21/17 19:14 | BWR | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385100 | 08/21/17 16:45 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 385068 | 08/21/17 17:18 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-07-55-57

**Lab Sample ID: 680-142177-4**

**Date Collected: 08/16/17 10:00**
**Matrix: Water**
**Date Received: 08/17/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 492720 | 08/24/17 11:15 | CJM | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 492104 | 08/18/17 11:07 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 492595 | 08/23/17 02:57 | BCB | TAL SAV |
| | Instrument ID: | ICPF | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 492102 | 08/18/17 11:07 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 492392 | 08/21/17 19:17 | BWR | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385100 | 08/21/17 17:00 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 385068 | 08/21/17 17:28 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-07-65-67

**Lab Sample ID: 680-142177-5**

**Date Collected: 08/16/17 12:10**
**Matrix: Water**
**Date Received: 08/17/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 492720 | 08/24/17 11:32 | CJM | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 492433 | 08/22/17 10:33 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 492781 | 08/23/17 20:09 | BCB | TAL SAV |
| | Instrument ID: | ICPF | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 492430 | 08/22/17 10:33 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 492728 | 08/23/17 15:55 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385100 | 08/21/17 17:46 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 385068 | 08/21/17 17:33 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142177-1

## Client Sample ID: SB-2017-07-75-77

**Lab Sample ID: 680-142177-6**

**Date Collected: 08/16/17 14:20**

**Matrix: Water**

**Date Received: 08/17/17 09:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 492720 | 08/24/17 11:50 | CJM | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 492433 | 08/22/17 10:33 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 492781 | 08/23/17 20:14 | BCB | TAL SAV |
| | Instrument ID: | ICPF | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 492430 | 08/22/17 10:33 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 492728 | 08/23/17 15:59 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385100 | 08/21/17 18:01 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 385068 | 08/21/17 16:13 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 1 of: 1

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation

Sampler(s) Signature(s)

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-7-25-27 | 8/15/17 | 1145 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-35-37 | 8/15/17 | 1315 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-45-47 | 8/15/17 | 1520 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-55-57 | 8/16/17 | 1000 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-65-67 | 8/16/17 | 1210 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-75-77 | 8/16/17 | 1420 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |

680-142177 Chain of Custody

Shipping Details: courier pick up

Total Number of Containers

| Date Out: Via: | Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|
| Returned: Via: | | [illegible] 1645 | 8/16/17 | 1445 | [illegible] | 8/16/17 | 1445 |
| | | [illegible] | 8-16-17 | 1800 | [illegible] | 8/17/17 | 0815 |

Additional Comments:
* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**
Seal #
Preserve Where Applicable ☐
On ICE ☐
Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

2.2(CF+0.2)2.4

| | | | | | |
|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

360325-Boston 360325-Boston 360325-Boston 360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 1 of: 1

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation

Sampler(s) Signature(s)

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-7-25-27 | 8/15/17 | 1105 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-35-37 | 8/15/17 | 1315 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-45-47 | 8/15/17 | 1520 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-55-57 | 8/16/17 | 1000 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-65-67 | 8/16/17 | 1210 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-75-77 | 8/16/17 | 1420 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |

680-142177 Chain of Custody

Shipping Details: courier pick up

Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | | 8/16/17 | 1445 | | | 8-17-17 | 1445 |
| Additional Comments: | | | | 8-16-17 | 1800 | | | 8-17-17 | 0845 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:

lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable

On ICE

Temperature 0.8 C IR#7 +0.1

- NJ Reduced
- NJ Full
- Full CLP
- Disk Deliverable
- Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

360325-Boston 360325-Boston 360325-Boston 360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 1 of: 1

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation

Sampler(s) Signature(s)

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-7-25-27 | 8/15/17 | 1105 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-35-37 | 8/15/17 | 1315 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-45-47 | 8/15/17 | 1520 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-55-57 | 8/16/17 | 1000 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-65-67 | 8/16/17 | 1210 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-7-75-77 | 8/16/17 | 1420 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |

680-142177 Chain of Custody

Total Number of Containers

Shipping Details: courier pick up

Date Out: Via:
Returned: Via:
Additional Comments:
* = Dissolved Metals include: Fe, Mn (6010); As (6020)

| Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|
| | 1165 | 8/16/17 | 1445 | | 8/16/17 | 1445 |
| | | 8/16/17 | 1800 | | 8/17/17 | 0845 |

email logs and results to:
lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐
On ICE ☐

Temperature 0.6 C
IR#7 +0.1

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

# Login Sample Receipt Checklist

Client: KOMAN Government Solutions, LLC

Job Number: 680-142177-1

**Login Number: 142177**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: Ragnaldsen, Amy E**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142177-1

## Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| | AFCEE | | SAVLAB | |
| Alabama | State Program | 4 | 41450 | 06-30-18 |
| Alaska | State Program | 10 | | 06-30-18 |
| Alaska (UST) | State Program | 10 | UST-104 | 11-05-17 |
| Arizona | State Program | 9 | AZ808 | 12-14-17 |
| Arkansas DEQ | State Program | 6 | 88-0692 | 02-01-18 |
| California | State Program | 9 | 2939 | 06-30-17 * |
| Colorado | State Program | 8 | N/A | 12-31-17 |
| Connecticut | State Program | 1 | PH-0161 | 03-31-19 |
| Florida | NELAP | 4 | E87052 | 06-30-18 |
| GA Dept. of Agriculture | State Program | 4 | N/A | 06-12-18 |
| Georgia | State Program | 4 | 803 | 06-30-18 |
| Guam | State Program | 9 | 15-005r | 04-16-18 |
| Hawaii | State Program | 9 | N/A | 06-30-18 |
| Illinois | NELAP | 5 | 200022 | 11-30-17 |
| Indiana | State Program | 5 | N/A | 06-30-18 |
| Iowa | State Program | 7 | 353 | 06-30-19 |
| Kentucky (DW) | State Program | 4 | 90084 | 12-31-17 |
| Kentucky (UST) | State Program | 4 | 18 | 06-30-18 |
| Kentucky (WW) | State Program | 4 | 90084 | 12-31-17 |
| L-A-B | DoD ELAP | | L2463 | 09-22-19 |
| L-A-B | ISO/IEC 17025 | | L2463.01 | 09-22-19 |
| Louisiana | NELAP | 6 | 30690 | 06-30-18 |
| Louisiana (DW) | NELAP | 6 | LA160019 | 12-31-17 |
| Maine | State Program | 1 | GA00006 | 09-24-18 |
| Maryland | State Program | 3 | 250 | 12-31-17 |
| Massachusetts | State Program | 1 | M-GA006 | 06-30-18 |
| Michigan | State Program | 5 | 9925 | 06-30-17 * |
| Mississippi | State Program | 4 | N/A | 06-30-18 |
| Nebraska | State Program | 7 | TestAmerica-Savannah | 06-30-18 |
| New Jersey | NELAP | 2 | GA769 | 06-30-18 |
| New Mexico | State Program | 6 | N/A | 06-30-18 |
| New York | NELAP | 2 | 10842 | 03-31-18 |
| North Carolina (DW) | State Program | 4 | 13701 | 07-31-18 |
| North Carolina (WW/SW) | State Program | 4 | 269 | 12-31-17 |
| Oklahoma | State Program | 6 | 9984 | 08-31-17 * |
| Pennsylvania | NELAP | 3 | 68-00474 | 06-30-18 |
| Puerto Rico | State Program | 2 | GA00006 | 12-31-17 |
| South Carolina | State Program | 4 | 98001 | 06-30-17 * |
| Tennessee | State Program | 4 | TN02961 | 06-30-18 |
| Texas | NELAP | 6 | T104704185-16-9 | 11-30-17 |
| US Fish & Wildlife | Federal | | LE058448-0 | 07-31-18 |
| USDA | Federal | | SAV 3-04 | 06-14-20 * |
| Virginia | NELAP | 3 | 460161 | 06-14-18 |
| Washington | State Program | 10 | C805 | 06-10-18 |
| West Virginia (DW) | State Program | 3 | 9950C | 12-31-17 |
| West Virginia DEP | State Program | 3 | 094 | 06-30-18 |
| Wisconsin | State Program | 5 | 999819810 | 08-31-17 * |
| Wyoming | State Program | 8 | 8TMS-L | 06-30-16 * |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142177-1

## Laboratory: TestAmerica Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

TestAmerica Job ID: 680-142317-1
Client Project/Site: Deven's Shepley's Hill Landfill

For:
KOMAN Government Solutions, LLC
293 Boston Post Road
Suite 100
Marlborough, Massachusetts 01752

Attn: Laurie Ekes

*Authorized for release by:*
*8/29/2017 3:53:45 PM*

Jerry Lanier, Project Manager I
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jerry.lanier@testamericainc.com

LINKS

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*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Job ID: 680-142317-1

**Laboratory: TestAmerica Savannah**

**Narrative**

# CASE NARRATIVE

## Client: KOMAN Government Solutions, LLC

## Project: Deven's Shepley's Hill Landfill

## Report Number: 680-142317-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 08/19/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.4 C.

**METALS (ICP) - DISSOLVED**
Samples SB-2017-06-35-37 (680-142317-1) and SB-2017-06-45-47 (680-142317-2) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 08/25/2017 and analyzed on 08/26/2017.

Manganese failed the recovery criteria low for the MSD of sample SB-2017-06-45-47MSD (680-142317-2) in batch 680-493181.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples SB-2017-06-35-37 (680-142317-1) and SB-2017-06-45-47 (680-142317-2) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared and analyzed on 08/25/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples SB-2017-06-35-37 (680-142317-1) and SB-2017-06-45-47 (680-142317-2) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 08/24/2017.

The method blank for method 2320B analytical batch 280-385472 contained Alkalinity above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**
Samples SB-2017-06-35-37 (680-142317-1) and SB-2017-06-45-47 (680-142317-2) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 08/24/2017 and 08/25/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**DISSOLVED ORGANIC CARBON**

## Job ID: 680-142317-1 (Continued)

### Laboratory: TestAmerica Savannah (Continued)

Samples SB-2017-06-35-37 (680-142317-1) and SB-2017-06-45-47 (680-142317-2) were analyzed for dissolved organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 08/21/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Deven's Shepley's Hill Landfill

TestAmerica Job ID: 680-142317-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 680-142317-1 | SB-2017-06-35-37 | GW | 08/17/17 12:20 | 08/19/17 09:25 |
| 680-142317-2 | SB-2017-06-45-47 | GW | 08/17/17 16:30 | 08/19/17 09:25 |

# Method Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Deven's Shepley's Hill Landfill

TestAmerica Job ID: 680-142317-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060 | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| U | Undetected at the Limit of Detection. |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Deven's Shepley's Hill Landfill

TestAmerica Job ID: 680-142317-1

## Client Sample ID: SB-2017-06-35-37

**Lab Sample ID: 680-142317-1**

**Date Collected: 08/17/17 12:20**
**Matrix: GW**
**Date Received: 08/19/17 09:25**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.3 | | 0.50 | 0.50 | 0.20 | mg/L | | 08/24/17 12:07 | 1 |
| Sulfate | 3.2 | M | 1.0 | 1.0 | 0.40 | mg/L | | 08/24/17 12:07 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 620 | | 50 | 50 | 17 | ug/L | | 08/26/17 01:11 | 1 |
| Manganese | 490 | | 10 | 3.0 | 1.0 | ug/L | | 08/26/17 01:11 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 08/25/17 16:30 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 25 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/24/17 10:56 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.78 | J | 1.0 | 0.50 | 0.16 | mg/L | | 08/21/17 18:15 | 1 |

## Client Sample ID: SB-2017-06-45-47

**Lab Sample ID: 680-142317-2**

**Date Collected: 08/17/17 16:30**
**Matrix: GW**
**Date Received: 08/19/17 09:25**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.4 | | 0.50 | 0.50 | 0.20 | mg/L | | 08/25/17 13:09 | 1 |
| Sulfate | 3.0 | M | 1.0 | 1.0 | 0.40 | mg/L | | 08/25/17 13:09 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 08/26/17 00:39 | 1 |
| Manganese | 1500 | J | 10 | 3.0 | 1.0 | ug/L | | 08/26/17 00:39 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 08/25/17 16:10 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 52 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/24/17 11:01 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.3 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/21/17 18:32 | 1 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-492720/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 492720**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 08/24/17 08:38 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 08/24/17 08:38 | 1 |

**Lab Sample ID: LCS 680-492720/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 492720**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.94 | | mg/L | | 99 | 87 - 111 |
| Sulfate | 10.0 | 9.85 | | mg/L | | 98 | 87 - 112 |

**Lab Sample ID: LCSD 680-492720/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 492720**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.99 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 9.95 | | mg/L | | 100 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-142317-1 DU** — **Client Sample ID: SB-2017-06-35-37**
**Matrix: GW** — **Prep Type: Total/NA**
**Analysis Batch: 492720**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Chloride | 2.3 | | 2.28 | | mg/L | | 0.2 | 15 |
| Sulfate | 3.2 | M | 3.21 | M | mg/L | | 0.2 | 15 |

**Lab Sample ID: MB 680-492857/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 492857**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 08/25/17 06:58 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 08/25/17 06:58 | 1 |

**Lab Sample ID: LCS 680-492857/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 492857**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.0 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: LCSD 680-492857/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 492857**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.0 | | mg/L | | 100 | 87 - 111 | 0 | 15 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: LCSD 680-492857/4**
**Matrix: Water**
**Analysis Batch: 492857**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 10.0 | 10.3 | | mg/L | | 103 | 87 - 112 | 2 | 15 |

**Lab Sample ID: 680-142317-2 MS**
**Matrix: GW**
**Analysis Batch: 492857**

**Client Sample ID: SB-2017-06-45-47**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.4 | | 10.0 | 11.6 | | mg/L | | 102 | 87 - 111 |
| Sulfate | 3.0 | M | 10.0 | 12.4 | M | mg/L | | 94 | 87 - 112 |

**Lab Sample ID: 680-142317-2 MSD**
**Matrix: GW**
**Analysis Batch: 492857**

**Client Sample ID: SB-2017-06-45-47**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.4 | | 10.0 | 11.6 | | mg/L | | 103 | 87 - 111 | 0 | 15 |
| Sulfate | 3.0 | M | 10.0 | 12.4 | M | mg/L | | 94 | 87 - 112 | 0 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-492922/1-A**
**Matrix: Water**
**Analysis Batch: 493181**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 492922**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 08/26/17 00:30 | 1 |
| Manganese | 3.0 | U | 10 | 3.0 | 1.0 | ug/L | | 08/26/17 00:30 | 1 |

**Lab Sample ID: LCS 680-492922/2-A**
**Matrix: Water**
**Analysis Batch: 493181**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 492922**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4960 | | ug/L | | 99 | 87 - 115 |
| Manganese | 500 | 539 | | ug/L | | 108 | 90 - 114 |

**Lab Sample ID: 680-142317-2 MS**
**Matrix: GW**
**Analysis Batch: 493181**

**Client Sample ID: SB-2017-06-45-47**
**Prep Type: Dissolved**
**Prep Batch: 492922**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 5000 | 4920 | | ug/L | | 98 | 87 - 115 |
| Manganese | 1500 | J | 500 | 2020 | | ug/L | | 108 | 90 - 114 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 680-142317-2 MSD** — **Client Sample ID: SB-2017-06-45-47**
**Matrix: GW** — **Prep Type: Dissolved**
**Analysis Batch: 493181** — **Prep Batch: 492922**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 5000 | 4840 | | ug/L | | 97 | 87 - 115 | 2 | 20 |
| Manganese | 1500 | J | 500 | 1890 | J | ug/L | | 82 | 90 - 114 | 7 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-492921/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 493139** — **Prep Batch: 492921**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 08/25/17 16:03 | 1 |

**Lab Sample ID: LCS 680-492921/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 493139** — **Prep Batch: 492921**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 107 | | ug/L | | 107 | 84 - 116 |

**Lab Sample ID: 680-142317-2 MS** — **Client Sample ID: SB-2017-06-45-47**
**Matrix: GW** — **Prep Type: Dissolved**
**Analysis Batch: 493139** — **Prep Batch: 492921**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 100 | 105 | | ug/L | | 105 | 84 - 116 |

**Lab Sample ID: 680-142317-2 MSD** — **Client Sample ID: SB-2017-06-45-47**
**Matrix: GW** — **Prep Type: Dissolved**
**Analysis Batch: 493139** — **Prep Batch: 492921**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 100 | 102 | | ug/L | | 102 | 84 - 116 | 3 | 20 |

## Method: 9060 - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-385100/4** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 385100**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 08/21/17 14:24 | 1 |

**Lab Sample ID: LCS 280-385100/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 385100**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 25.0 | 23.6 | | mg/L | | 94 | 88 - 112 |

# QC Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Deven's Shepley's Hill Landfill

TestAmerica Job ID: 680-142317-1

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-385472/5**
**Matrix: Water**
**Analysis Batch: 385472**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.05 | J | 5.0 | 3.2 | 1.1 | mg/L | | 08/24/17 10:15 | 1 |

**Lab Sample ID: LCS 280-385472/4**
**Matrix: Water**
**Analysis Batch: 385472**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 189 | | mg/L | | 95 | 90 - 110 | | |

# QC Association Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Deven's Shepley's Hill Landfill

TestAmerica Job ID: 680-142317-1

## HPLC/IC

### Analysis Batch: 492720

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142317-1 | SB-2017-06-35-37 | Total/NA | GW | 9056A | |
| MB 680-492720/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-492720/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-492720/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-142317-1 DU | SB-2017-06-35-37 | Total/NA | GW | 9056A | |

### Analysis Batch: 492857

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142317-2 | SB-2017-06-45-47 | Total/NA | GW | 9056A | |
| MB 680-492857/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-492857/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-492857/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-142317-2 MS | SB-2017-06-45-47 | Total/NA | GW | 9056A | |
| 680-142317-2 MSD | SB-2017-06-45-47 | Total/NA | GW | 9056A | |

## Metals

### Prep Batch: 492921

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142317-1 | SB-2017-06-35-37 | Dissolved | GW | 3005A | |
| 680-142317-2 | SB-2017-06-45-47 | Dissolved | GW | 3005A | |
| MB 680-492921/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-492921/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-142317-2 MS | SB-2017-06-45-47 | Dissolved | GW | 3005A | |
| 680-142317-2 MSD | SB-2017-06-45-47 | Dissolved | GW | 3005A | |

### Prep Batch: 492922

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142317-1 | SB-2017-06-35-37 | Dissolved | GW | 3005A | |
| 680-142317-2 | SB-2017-06-45-47 | Dissolved | GW | 3005A | |
| MB 680-492922/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-492922/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-142317-2 MS | SB-2017-06-45-47 | Dissolved | GW | 3005A | |
| 680-142317-2 MSD | SB-2017-06-45-47 | Dissolved | GW | 3005A | |

### Analysis Batch: 493139

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142317-1 | SB-2017-06-35-37 | Dissolved | GW | 6020A | 492921 |
| 680-142317-2 | SB-2017-06-45-47 | Dissolved | GW | 6020A | 492921 |
| MB 680-492921/1-A | Method Blank | Total Recoverable | Water | 6020A | 492921 |
| LCS 680-492921/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 492921 |
| 680-142317-2 MS | SB-2017-06-45-47 | Dissolved | GW | 6020A | 492921 |
| 680-142317-2 MSD | SB-2017-06-45-47 | Dissolved | GW | 6020A | 492921 |

### Analysis Batch: 493181

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142317-1 | SB-2017-06-35-37 | Dissolved | GW | 6010C | 492922 |
| 680-142317-2 | SB-2017-06-45-47 | Dissolved | GW | 6010C | 492922 |
| MB 680-492922/1-A | Method Blank | Total Recoverable | Water | 6010C | 492922 |
| LCS 680-492922/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 492922 |

## Metals (Continued)

### Analysis Batch: 493181 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142317-2 MS | SB-2017-06-45-47 | Dissolved | GW | 6010C | 492922 |
| 680-142317-2 MSD | SB-2017-06-45-47 | Dissolved | GW | 6010C | 492922 |

## General Chemistry

### Analysis Batch: 385100

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142317-1 | SB-2017-06-35-37 | Dissolved | GW | 9060 | |
| 680-142317-2 | SB-2017-06-45-47 | Dissolved | GW | 9060 | |
| MB 280-385100/4 | Method Blank | Dissolved | Water | 9060 | |
| LCS 280-385100/3 | Lab Control Sample | Dissolved | Water | 9060 | |

### Analysis Batch: 385472

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142317-1 | SB-2017-06-35-37 | Total/NA | GW | SM 2320B | |
| 680-142317-2 | SB-2017-06-45-47 | Total/NA | GW | SM 2320B | |
| MB 280-385472/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-385472/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Deven's Shepley's Hill Landfill

TestAmerica Job ID: 680-142317-1

## Client Sample ID: SB-2017-06-35-37

**Lab Sample ID: 680-142317-1**

**Date Collected: 08/17/17 12:20**

**Matrix: GW**

**Date Received: 08/19/17 09:25**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 492720 | 08/24/17 12:07 | CJM | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 492922 | 08/25/17 10:38 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493181 | 08/26/17 01:11 | BCB | TAL SAV |
| | Instrument ID: | ICPF | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 492921 | 08/25/17 10:38 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493139 | 08/25/17 16:30 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385100 | 08/21/17 18:15 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 385472 | 08/24/17 10:56 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-06-45-47

**Lab Sample ID: 680-142317-2**

**Date Collected: 08/17/17 16:30**

**Matrix: GW**

**Date Received: 08/19/17 09:25**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 492857 | 08/25/17 13:09 | CJM | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 492922 | 08/25/17 10:38 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493181 | 08/26/17 00:39 | BCB | TAL SAV |
| | Instrument ID: | ICPF | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 492921 | 08/25/17 10:38 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493139 | 08/25/17 16:10 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385100 | 08/21/17 18:32 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 385472 | 08/24/17 11:01 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 1 of: 1

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation

Sampler(s) Signature(s)

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-6-35-37 | 8/17/17 | 1220 | GW | 4 | X | X | X | X | | |
| SB-2017-6-45-47 | 8/17/17 | 1630 | GW | 4 | X | X | X | X | | |
| SB-2017- | | | GW | | | | | | | |
| SB-2017- | | | GW | | | | | | | |
| SB-2017- | | | GW | | | | | | | |
| SB-2017- | | | GW | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

680-142317 Chain of Custody

Shipping Details: courier pick up

← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | | 8/18/17 | 1250 | | 8/18/17 | 12:50 |
| Additional Comments: | | | | 8/18/17 | 15:45 | | | |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:

lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐

On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

360325-Boston

360325-Boston

| -00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 | **Chain of Custody Record** | Page: 1 of: 1 |
|---|---|---|---|---|

KOMAN Government Solutions, LLC

dress: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752
one: 508-366-7442 Cell: 508-367-7190

KGS

Preservatives (see codes): N I I S S I O S

Analyses Requested

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility: ns Shepley's Hill Landfill

mpled by [Print Name(s)]/Affilliation

ampler(s) Signature(s)

680-142317 Chain of Custody

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-6-35-37 | 8/17/17 | 1220 | GW | 4 | X | X | X | X | | |
| SB-2017-6-45-47 | 8/17/17 | 1630 | GW | 4 | X | X | X | X | | |
| SB-2017- | | | GW | | | | | | DOC + ALKALINITY TO DENVER | |
| SB-2017- | | | GW | | | | | | | |
| SB-2017- | | | GW | | | | | | the REST TO SAVANNAH | |
| SB-2017- | | | GW | | | | | | | |

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | [signature] | 8/18/17 | 1250 | [signature] | 8/18/17 | 12:50 |
| Additional Comments: | | | [signature] | 8/19/17 | 15:45 | [signature] | 8/19/17 | 0835 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal # _____ Preserve Where Applicable ☐ On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

3.3 to 1 IR#7 transfered by JT 8/19/17

| | | | | | |
|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

360325-Boston

360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 1 of: 1

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation

Sampler(s) Signature(s)

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility: ...ns Shepley's Hill Landfill

680-142317 Chain of Custody

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-6-35-37 | 8/17/17 | 1220 | GW | 4 | X | X | X | X | | |
| SB-2017-6-45-47 | 8/17/17 | 1630 | GW | 4 | X | X | X | X | | |
| SB-2017- | | | GW | | | | | | | |
| SB-2017- | | | GW | | | | | | | |
| SB-2017- | | | GW | | | | | | | |
| SB-2017- | | | GW | | | | | | | |

DOC + ALKALINITY TO DENVER
the REST TO SAVANNAH

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | [signature] | 8/18/17 | 1250 | [signature] | 8/18/17 | 12:50 |
| Additional Comments: | | | [signature] | 8/18/17 | 15:45 | [signature] | 8/19/17 | 0835 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal # _____ Preserve Where Applicable ☐ On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

3.3 to 1 IR#7 transfered by JT 8/19/17

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

# Login Sample Receipt Checklist

Client: KOMAN Government Solutions, LLC

Job Number: 680-142317-1

**Login Number: 142317**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: Duncan, Bradley T**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | N/A | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Deven's Shepley's Hill Landfill

TestAmerica Job ID: 680-142317-1

## Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| | AFCEE | | SAVLAB | |
| Alabama | State Program | 4 | 41450 | 06-30-18 |
| Alaska | State Program | 10 | | 06-30-18 |
| Alaska (UST) | State Program | 10 | UST-104 | 11-05-17 |
| Arizona | State Program | 9 | AZ808 | 12-14-17 |
| Arkansas DEQ | State Program | 6 | 88-0692 | 02-01-18 |
| California | State Program | 9 | 2939 | 06-30-17 * |
| Colorado | State Program | 8 | N/A | 12-31-17 |
| Connecticut | State Program | 1 | PH-0161 | 03-31-19 |
| Florida | NELAP | 4 | E87052 | 06-30-18 |
| GA Dept. of Agriculture | State Program | 4 | N/A | 06-12-18 |
| Georgia | State Program | 4 | 803 | 06-30-18 |
| Guam | State Program | 9 | 15-005r | 04-16-18 |
| Hawaii | State Program | 9 | N/A | 06-30-18 |
| Illinois | NELAP | 5 | 200022 | 11-30-17 |
| Indiana | State Program | 5 | N/A | 06-30-18 |
| Iowa | State Program | 7 | 353 | 06-30-19 |
| Kentucky (DW) | State Program | 4 | 90084 | 12-31-17 |
| Kentucky (UST) | State Program | 4 | 18 | 06-30-18 |
| Kentucky (WW) | State Program | 4 | 90084 | 12-31-17 |
| L-A-B | DoD ELAP | | L2463 | 09-22-19 |
| L-A-B | ISO/IEC 17025 | | L2463.01 | 09-22-19 |
| Louisiana | NELAP | 6 | 30690 | 06-30-18 |
| Louisiana (DW) | NELAP | 6 | LA160019 | 12-31-17 |
| Maine | State Program | 1 | GA00006 | 09-24-18 |
| Maryland | State Program | 3 | 250 | 12-31-17 |
| Massachusetts | State Program | 1 | M-GA006 | 06-30-18 |
| Michigan | State Program | 5 | 9925 | 06-30-17 * |
| Mississippi | State Program | 4 | N/A | 06-30-18 |
| Nebraska | State Program | 7 | TestAmerica-Savannah | 06-30-18 |
| New Jersey | NELAP | 2 | GA769 | 06-30-18 |
| New Mexico | State Program | 6 | N/A | 06-30-18 |
| New York | NELAP | 2 | 10842 | 03-31-18 |
| North Carolina (DW) | State Program | 4 | 13701 | 07-31-18 |
| North Carolina (WW/SW) | State Program | 4 | 269 | 12-31-17 |
| Oklahoma | State Program | 6 | 9984 | 08-31-17 * |
| Pennsylvania | NELAP | 3 | 68-00474 | 06-30-18 |
| Puerto Rico | State Program | 2 | GA00006 | 12-31-17 |
| South Carolina | State Program | 4 | 98001 | 06-30-17 * |
| Tennessee | State Program | 4 | TN02961 | 06-30-18 |
| Texas | NELAP | 6 | T104704185-16-9 | 11-30-17 |
| US Fish & Wildlife | Federal | | LE058448-0 | 07-31-18 |
| USDA | Federal | | SAV 3-04 | 06-14-20 * |
| Virginia | NELAP | 3 | 460161 | 06-14-18 |
| Washington | State Program | 10 | C805 | 06-10-18 |
| West Virginia (DW) | State Program | 3 | 9950C | 12-31-17 |
| West Virginia DEP | State Program | 3 | 094 | 06-30-18 |
| Wisconsin | State Program | 5 | 999819810 | 08-31-17 * |
| Wyoming | State Program | 8 | 8TMS-L | 06-30-16 * |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Deven's Shepley's Hill Landfill

TestAmerica Job ID: 680-142317-1

## Laboratory: TestAmerica Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

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TestAmerica Job ID: 680-142501-1
Client Project/Site: Devens - SHL EPA SOW Phase 1

For:
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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Job ID: 680-142501-1

**Laboratory: TestAmerica Savannah**

**Narrative**

# CASE NARRATIVE

## Client: KOMAN Government Solutions, LLC

## Project: Devens - SHL EPA SOW Phase 1

## Report Number: 680-142501-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 8/25/2017 9:05 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.8º C and 2.3º C.

**METALS (ICP) - DISSOLVED**
Samples SB-2017-06-62-64 (680-142501-1), SB-2017-08-27-29 (680-142501-2), SB-2017-08-37-39 (680-142501-3), SB-2017-08-47-49 (680-142501-4), SB-2017-DUP-1 (680-142501-5), SB-2017-08-57-59 (680-142501-6), SB-2017-08-67-69 (680-142501-7), SB-2017-08-77-79 (680-142501-8), SB-2017-08-87-89 (680-142501-9), SB-2017-08-94.6-96.6 (680-142501-10), SB-2017-09-22-24 (680-142501-11), SB-2017-09-32-34 (680-142501-12), SB-2017-DUP-2 (680-142501-13) and SB-2017-09-42-44 (680-142501-14) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 08/28/2017 and analyzed on 08/31/2017.

Iron and Manganese exceeded the recovery criteria low for the MS of sample SB-2017-09-42-44MS (680-142501-14) in batch 680-493827.

Manganese exceeded the recovery criteria high for the MSD of sample SB-2017-09-42-44MSD (680-142501-14) in batch 680-493827.

Iron and Manganese exceeded the recovery criteria high for the MS of sample SB-2017-08-47-49MS (680-142501-4) in batch 680-493827.

Iron exceeded the recovery criteria low for the MSD of sample SB-2017-08-47-49MSD (680-142501-4) in batch 680-493827.

The interference check standard solution (ICSA) associated with batch 680-493494 had results for one or more elements at a level greater than 2 times the limit of detection (LOD).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples SB-2017-06-62-64 (680-142501-1), SB-2017-08-27-29 (680-142501-2), SB-2017-08-37-39 (680-142501-3), SB-2017-08-47-49 (680-142501-4), SB-2017-DUP-1 (680-142501-5), SB-2017-08-57-59 (680-142501-6), SB-2017-08-67-69 (680-142501-7), SB-2017-08-77-79 (680-142501-8), SB-2017-08-87-89 (680-142501-9), SB-2017-08-94.6-96.6 (680-142501-10), SB-2017-09-22-24 (680-142501-11), SB-2017-09-32-34 (680-142501-12), SB-2017-DUP-2 (680-142501-13) and SB-2017-09-42-44 (680-142501-14) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 08/28/2017 and analyzed on 08/29/2017.

Arsenic exceeded the recovery criteria high for the MSD of sample SB-2017-09-42-44MSD (680-142501-14) in batch 680-493494. Arsenic exceeded the RPD limit.

Arsenic exceeded the recovery criteria high for the MS and MSD of sample SB-2017-08-47-49 (680-142501-4) in batch 680-493494.

## Job ID: 680-142501-1 (Continued)

### Laboratory: TestAmerica Savannah (Continued)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**

Samples SB-2017-06-62-64 (680-142501-1), SB-2017-08-27-29 (680-142501-2), SB-2017-08-37-39 (680-142501-3), SB-2017-08-47-49 (680-142501-4), SB-2017-DUP-1 (680-142501-5), SB-2017-08-57-59 (680-142501-6), SB-2017-08-67-69 (680-142501-7), SB-2017-08-77-79 (680-142501-8), SB-2017-08-87-89 (680-142501-9), SB-2017-08-94.6-96.6 (680-142501-10), SB-2017-09-22-24 (680-142501-11), SB-2017-09-32-34 (680-142501-12), SB-2017-DUP-2 (680-142501-13) and SB-2017-09-42-44 (680-142501-14) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 08/29/2017 and 08/30/2017.

Alkalinity was detected in method blank MB 280-386093/5 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Alkalinity was detected in method blank MB 280-386182/5 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**

Samples SB-2017-06-62-64 (680-142501-1), SB-2017-08-27-29 (680-142501-2), SB-2017-08-37-39 (680-142501-3), SB-2017-08-47-49 (680-142501-4), SB-2017-DUP-1 (680-142501-5), SB-2017-08-57-59 (680-142501-6), SB-2017-08-67-69 (680-142501-7), SB-2017-08-77-79 (680-142501-8), SB-2017-08-87-89 (680-142501-9), SB-2017-08-94.6-96.6 (680-142501-10), SB-2017-09-22-24 (680-142501-11), SB-2017-09-32-34 (680-142501-12), SB-2017-DUP-2 (680-142501-13) and SB-2017-09-42-44 (680-142501-14) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 09/01/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**DISSOLVED ORGANIC CARBON**

Samples SB-2017-06-62-64 (680-142501-1), SB-2017-08-27-29 (680-142501-2), SB-2017-08-37-39 (680-142501-3), SB-2017-08-47-49 (680-142501-4), SB-2017-DUP-1 (680-142501-5), SB-2017-08-57-59 (680-142501-6), SB-2017-08-67-69 (680-142501-7), SB-2017-08-77-79 (680-142501-8), SB-2017-08-87-89 (680-142501-9), SB-2017-08-94.6-96.6 (680-142501-10), SB-2017-09-22-24 (680-142501-11), SB-2017-09-32-34 (680-142501-12), SB-2017-DUP-2 (680-142501-13) and SB-2017-09-42-44 (680-142501-14) were analyzed for dissolved organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 08/28/2017 and 08/29/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 680-142501-1 | SB-2017-06-62-64 | Water | 08/21/17 10:00 | 08/25/17 09:05 |
| 680-142501-2 | SB-2017-08-27-29 | Water | 08/21/17 13:15 | 08/25/17 09:05 |
| 680-142501-3 | SB-2017-08-37-39 | Water | 08/21/17 14:40 | 08/25/17 09:05 |
| 680-142501-4 | SB-2017-08-47-49 | Water | 08/21/17 16:00 | 08/25/17 09:05 |
| 680-142501-5 | SB-2017-DUP-1 | Water | 08/21/17 16:10 | 08/25/17 09:05 |
| 680-142501-6 | SB-2017-08-57-59 | Water | 08/22/17 09:15 | 08/25/17 09:05 |
| 680-142501-7 | SB-2017-08-67-69 | Water | 08/22/17 10:55 | 08/25/17 09:05 |
| 680-142501-8 | SB-2017-08-77-79 | Water | 08/22/17 12:40 | 08/25/17 09:05 |
| 680-142501-9 | SB-2017-08-87-89 | Water | 08/22/17 16:10 | 08/25/17 09:05 |
| 680-142501-10 | SB-2017-08-94.6-96.6 | Water | 08/23/17 10:25 | 08/25/17 09:05 |
| 680-142501-11 | SB-2017-09-22-24 | Water | 08/23/17 14:05 | 08/25/17 09:05 |
| 680-142501-12 | SB-2017-09-32-34 | Water | 08/23/17 15:30 | 08/25/17 09:05 |
| 680-142501-13 | SB-2017-DUP-2 | Water | 08/23/17 15:35 | 08/25/17 09:05 |
| 680-142501-14 | SB-2017-09-42-44 | Water | 08/23/17 09:45 | 08/25/17 09:05 |

# Method Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060 | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## Client Sample ID: SB-2017-06-62-64

**Lab Sample ID: 680-142501-1**

**Date Collected: 08/21/17 10:00**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.9 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 02:33 | 1 |
| Sulfate | 4.3 | | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 02:33 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 41 | J | 50 | 50 | 17 | ug/L | | 08/31/17 17:51 | 1 |
| Manganese | 340 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 17:51 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 18 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 17:46 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 21 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/29/17 17:42 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.82 | J | 1.0 | 0.50 | 0.16 | mg/L | | 08/28/17 21:02 | 1 |

## Client Sample ID: SB-2017-08-27-29

**Lab Sample ID: 680-142501-2**

**Date Collected: 08/21/17 13:15**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 16 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 02:51 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 02:51 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 20000 | | 50 | 50 | 17 | ug/L | | 08/31/17 17:30 | 1 |
| Manganese | 920 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 17:30 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 14 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 17:31 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 570 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/29/17 17:54 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 21 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/28/17 21:17 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## Client Sample ID: SB-2017-08-37-39

**Lab Sample ID: 680-142501-3**

**Date Collected: 08/21/17 14:40**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.2 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 03:09 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 03:09 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 90000 | | 50 | 50 | 17 | ug/L | | 08/31/17 16:44 | 1 |
| Manganese | 1700 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 16:44 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 220 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 17:03 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 270 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/29/17 18:00 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 6.3 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/28/17 22:05 | 1 |

## Client Sample ID: SB-2017-08-47-49

**Lab Sample ID: 680-142501-4**

**Date Collected: 08/21/17 16:00**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.7 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 03:27 | 1 |
| Sulfate | 0.50 | J M | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 03:27 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 73000 | J | 50 | 50 | 17 | ug/L | | 08/31/17 15:52 | 1 |
| Manganese | 2400 | J | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 15:52 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 890 | J | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 16:26 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 240 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/29/17 18:05 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 5.1 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/28/17 22:22 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## Client Sample ID: SB-2017-DUP-1

**Lab Sample ID: 680-142501-5**

**Date Collected: 08/21/17 16:10**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.7 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 04:21 | 1 |
| Sulfate | 0.50 | J M | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 04:21 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 76000 | | 50 | 50 | 17 | ug/L | | 08/31/17 17:56 | 1 |
| Manganese | 2500 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 17:56 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1000 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 17:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 240 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/29/17 18:11 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 5.4 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/28/17 23:08 | 1 |

## Client Sample ID: SB-2017-08-57-59

**Lab Sample ID: 680-142501-6**

**Date Collected: 08/22/17 09:15**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 8.4 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 05:33 | 1 |
| Sulfate | 2.7 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 05:33 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 110000 | | 50 | 50 | 17 | ug/L | | 08/31/17 17:15 | 1 |
| Manganese | 3400 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 17:15 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 5200 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 17:24 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 220 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/29/17 18:16 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.2 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/28/17 23:25 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## Client Sample ID: SB-2017-08-67-69

**Lab Sample ID: 680-142501-7**

**Date Collected: 08/22/17 10:55**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 05:51 | 1 |
| Sulfate | 3.7 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 05:51 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 110000 | | 50 | 50 | 17 | ug/L | | 08/31/17 17:20 | 1 |
| Manganese | 1200 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 17:20 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3500 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 17:28 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 230 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/29/17 18:22 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.4 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/28/17 23:39 | 1 |

## Client Sample ID: SB-2017-08-77-79

**Lab Sample ID: 680-142501-8**

**Date Collected: 08/22/17 12:40**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 15 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 06:09 | 1 |
| Sulfate | 8.4 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 06:09 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 76000 | | 50 | 50 | 17 | ug/L | | 08/31/17 16:49 | 1 |
| Manganese | 1300 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 16:49 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 5700 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 17:06 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 250 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/29/17 18:27 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.6 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/28/17 23:54 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## Client Sample ID: SB-2017-08-87-89

**Lab Sample ID: 680-142501-9**

**Date Collected: 08/22/17 16:10**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 13 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 06:27 | 1 |
| Sulfate | 7.1 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 06:27 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 48000 | | 50 | 50 | 17 | ug/L | | 08/31/17 16:54 | 1 |
| Manganese | 2400 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 16:54 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 6500 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 17:10 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 230 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/30/17 14:30 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.0 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 00:11 | 1 |

## Client Sample ID: SB-2017-08-94.6-96.6

**Lab Sample ID: 680-142501-10**

**Date Collected: 08/23/17 10:25**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 11 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 21:55 | 1 |
| Sulfate | 6.7 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 21:55 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 33000 | | 50 | 50 | 17 | ug/L | | 08/31/17 17:46 | 1 |
| Manganese | 6000 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 17:46 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7600 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 17:35 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 240 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/29/17 18:33 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.8 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 00:25 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## Client Sample ID: SB-2017-09-22-24

**Lab Sample ID: 680-142501-11**

**Date Collected: 08/23/17 14:05**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 22:31 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 22:31 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 21000 | | 50 | 50 | 17 | ug/L | | 08/31/17 17:09 | 1 |
| Manganese | 850 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 17:09 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 24 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 17:20 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 430 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/29/17 18:52 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 19 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 01:11 | 1 |

## Client Sample ID: SB-2017-09-32-34

**Lab Sample ID: 680-142501-12**

**Date Collected: 08/23/17 15:30**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.9 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 22:49 | 1 |
| Sulfate | 8.8 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 22:49 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 29000 | | 50 | 50 | 17 | ug/L | | 08/31/17 16:59 | 1 |
| Manganese | 1600 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 16:59 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 82 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 17:13 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 140 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/29/17 18:57 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 6.9 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 01:26 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## Client Sample ID: SB-2017-DUP-2

**Lab Sample ID: 680-142501-13**

**Date Collected: 08/23/17 15:35**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 7.0 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 23:07 | 1 |
| Sulfate | 8.9 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 23:07 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 30000 | | 50 | 50 | 17 | ug/L | | 08/31/17 17:04 | 1 |
| Manganese | 1600 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 17:04 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 74 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 17:17 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 140 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/29/17 19:02 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 6.8 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 01:44 | 1 |

## Client Sample ID: SB-2017-09-42-44

**Lab Sample ID: 680-142501-14**

**Date Collected: 08/23/17 09:45**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 31 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 21:01 | 1 |
| Sulfate | 0.44 | J M | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 21:01 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 60000 | J | 50 | 50 | 17 | ug/L | | 08/31/17 16:07 | 1 |
| Manganese | 5600 | J | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 16:07 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 120 | J | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 16:44 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 360 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/29/17 19:08 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 6.8 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 01:59 | 1 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-493770/36** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493770**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 08/31/17 21:10 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 08/31/17 21:10 | 1 |

**Lab Sample ID: LCS 680-493770/37** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493770**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.86 | | mg/L | | 99 | 87 - 111 |
| Sulfate | 10.0 | 9.79 | | mg/L | | 98 | 87 - 112 |

**Lab Sample ID: LCSD 680-493770/38** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493770**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.88 | | mg/L | | 99 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 9.88 | | mg/L | | 99 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-142501-4 MS** — **Client Sample ID: SB-2017-08-47-49**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493770**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.7 | | 10.0 | 15.8 | | mg/L | | 101 | 87 - 111 |
| Sulfate | 0.50 | J M | 10.0 | 9.72 | | mg/L | | 92 | 87 - 112 |

**Lab Sample ID: 680-142501-4 MSD** — **Client Sample ID: SB-2017-08-47-49**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493770**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.7 | | 10.0 | 15.8 | | mg/L | | 101 | 87 - 111 | 0 | 15 |
| Sulfate | 0.50 | J M | 10.0 | 9.78 | | mg/L | | 93 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-142501-5 DU** — **Client Sample ID: SB-2017-DUP-1**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493770**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Chloride | 5.7 | | 5.74 | | mg/L | | 0.2 | 15 |
| Sulfate | 0.50 | J M | 0.505 | J M | mg/L | | 0.3 | 15 |

**Lab Sample ID: MB 680-493845/27** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493845**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 16:13 | 1 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: MB 680-493845/27** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493845**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 16:13 | 1 |

**Lab Sample ID: LCS 680-493845/28** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493845**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.93 | | mg/L | | 99 | 87 - 111 |
| Sulfate | 10.0 | 10.0 | | mg/L | | 100 | 87 - 112 |

**Lab Sample ID: LCSD 680-493845/29** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493845**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.93 | | mg/L | | 99 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-142501-14 MS** — **Client Sample ID: SB-2017-09-42-44**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493845**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 31 | | 10.0 | 41.2 | | mg/L | | 98 | 87 - 111 |
| Sulfate | 0.44 | J M | 10.0 | 9.43 | M | mg/L | | 90 | 87 - 112 |

**Lab Sample ID: 680-142501-14 MSD** — **Client Sample ID: SB-2017-09-42-44**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493845**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 31 | | 10.0 | 41.1 | | mg/L | | 98 | 87 - 111 | 0 | 15 |
| Sulfate | 0.44 | J M | 10.0 | 9.42 | M | mg/L | | 90 | 87 - 112 | 0 | 15 |

**Lab Sample ID: 680-142501-10 DU** — **Client Sample ID: SB-2017-08-94.6-96.6**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493845**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Chloride | 11 | | 11.4 | | mg/L | | 0 | 15 |
| Sulfate | 6.7 | M | 6.66 | M | mg/L | | 0.1 | 15 |

# QC Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-493249/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 493827** — **Prep Batch: 493249**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 08/31/17 15:41 | 1 |
| Manganese | 3.0 | U | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 15:41 | 1 |

**Lab Sample ID: LCS 680-493249/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 493827** — **Prep Batch: 493249**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 5130 | | ug/L | | 103 | 87 - 115 |
| Manganese | 500 | 542 | | ug/L | | 108 | 90 - 114 |

**Lab Sample ID: 680-142501-4 MS** — **Client Sample ID: SB-2017-08-47-49**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 493827** — **Prep Batch: 493249**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 73000 | J | 5000 | 82900 | 4 | ug/L | | 200 | 87 - 115 |
| Manganese | 2400 | J | 500 | 3060 | 4 | ug/L | | 136 | 90 - 114 |

**Lab Sample ID: 680-142501-4 MSD** — **Client Sample ID: SB-2017-08-47-49**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 493827** — **Prep Batch: 493249**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 73000 | J | 5000 | 76800 | 4 | ug/L | | 79 | 87 - 115 | 8 | 20 |
| Manganese | 2400 | J | 500 | 2880 | 4 | ug/L | | 99 | 90 - 114 | 6 | 20 |

**Lab Sample ID: 680-142501-14 MS** — **Client Sample ID: SB-2017-09-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 493827** — **Prep Batch: 493249**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 60000 | J | 5000 | 57800 | 4 | ug/L | | -43 | 87 - 115 |
| Manganese | 5600 | J | 500 | 5680 | 4 | ug/L | | 7 | 90 - 114 |

**Lab Sample ID: 680-142501-14 MSD** — **Client Sample ID: SB-2017-09-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 493827** — **Prep Batch: 493249**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 60000 | J | 5000 | 65400 | 4 | ug/L | | 108 | 87 - 115 | 12 | 20 |
| Manganese | 5600 | J | 500 | 6370 | 4 | ug/L | | 144 | 90 - 114 | 11 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-493247/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 493494** — **Prep Batch: 493247**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 16:19 | 1 |

**Lab Sample ID: LCS 680-493247/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 493494** — **Prep Batch: 493247**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 106 | | ug/L | | 106 | 84 - 116 |

**Lab Sample ID: 680-142501-4 MS** — **Client Sample ID: SB-2017-08-47-49**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 493494** — **Prep Batch: 493247**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 890 | J | 100 | 1020 | 4 | ug/L | | 128 | 84 - 116 |

**Lab Sample ID: 680-142501-4 MSD** — **Client Sample ID: SB-2017-08-47-49**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 493494** — **Prep Batch: 493247**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 890 | J | 100 | 1040 | 4 | ug/L | | 150 | 84 - 116 | 2 | 20 |

**Lab Sample ID: 680-142501-14 MS** — **Client Sample ID: SB-2017-09-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 493494** — **Prep Batch: 493247**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 120 | J | 100 | 214 | | ug/L | | 98 | 84 - 116 |

**Lab Sample ID: 680-142501-14 MSD** — **Client Sample ID: SB-2017-09-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 493494** — **Prep Batch: 493247**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 120 | J | 100 | 269 | J | ug/L | | 153 | 84 - 116 | 23 | 20 |

## Method: 9060 - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-385928/35** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 385928**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 08/28/17 20:31 | 1 |

## Method: 9060 - Organic Carbon, Dissolved (DOC) (Continued)

**Lab Sample ID: LCS 280-385928/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 385928**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | | | 25.0 | 23.6 | | mg/L | | 94 | 88 - 112 | | |

**Lab Sample ID: 680-142501-4 MS** — **Client Sample ID: SB-2017-08-47-49**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 385928**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 5.1 | | 25.0 | 28.5 | | mg/L | | 94 | 88 - 112 | | |

**Lab Sample ID: 680-142501-4 MSD** — **Client Sample ID: SB-2017-08-47-49**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 385928**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 5.1 | | 25.0 | 28.7 | | mg/L | | 95 | 88 - 112 | 1 | 15 |

**Lab Sample ID: 680-142501-14 MS** — **Client Sample ID: SB-2017-09-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 385928**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 6.8 | | 25.0 | 30.4 | | mg/L | | 94 | 88 - 112 | | |

**Lab Sample ID: 680-142501-14 MSD** — **Client Sample ID: SB-2017-09-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 385928**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 6.8 | | 25.0 | 30.2 | | mg/L | | 94 | 88 - 112 | 1 | 15 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-386093/5** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386093**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.17 | J | 5.0 | 3.2 | 1.1 | mg/L | | 08/29/17 17:37 | 1 |

**Lab Sample ID: LCS 280-386093/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386093**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 193 | | mg/L | | 97 | 90 - 110 | | |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: 680-142501-1 DU**
**Matrix: Water**
**Analysis Batch: 386093**

**Client Sample ID: SB-2017-06-62-64**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 21 | B | | 20.1 | | mg/L | | | | 3 | 10 |

**Lab Sample ID: MB 280-386182/5**
**Matrix: Water**
**Analysis Batch: 386182**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.16 | J | 5.0 | 3.2 | 1.1 | mg/L | | 08/30/17 13:35 | 1 |

**Lab Sample ID: LCS 280-386182/4**
**Matrix: Water**
**Analysis Batch: 386182**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 193 | | mg/L | | 96 | 90 - 110 | | |

# QC Association Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## HPLC/IC

### Analysis Batch: 493770

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142501-1 | SB-2017-06-62-64 | Total/NA | Water | 9056A | |
| 680-142501-2 | SB-2017-08-27-29 | Total/NA | Water | 9056A | |
| 680-142501-3 | SB-2017-08-37-39 | Total/NA | Water | 9056A | |
| 680-142501-4 | SB-2017-08-47-49 | Total/NA | Water | 9056A | |
| 680-142501-5 | SB-2017-DUP-1 | Total/NA | Water | 9056A | |
| 680-142501-6 | SB-2017-08-57-59 | Total/NA | Water | 9056A | |
| 680-142501-7 | SB-2017-08-67-69 | Total/NA | Water | 9056A | |
| 680-142501-8 | SB-2017-08-77-79 | Total/NA | Water | 9056A | |
| 680-142501-9 | SB-2017-08-87-89 | Total/NA | Water | 9056A | |
| MB 680-493770/36 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-493770/37 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-493770/38 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-142501-4 MS | SB-2017-08-47-49 | Total/NA | Water | 9056A | |
| 680-142501-4 MSD | SB-2017-08-47-49 | Total/NA | Water | 9056A | |
| 680-142501-5 DU | SB-2017-DUP-1 | Total/NA | Water | 9056A | |

### Analysis Batch: 493845

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142501-10 | SB-2017-08-94.6-96.6 | Total/NA | Water | 9056A | |
| 680-142501-11 | SB-2017-09-22-24 | Total/NA | Water | 9056A | |
| 680-142501-12 | SB-2017-09-32-34 | Total/NA | Water | 9056A | |
| 680-142501-13 | SB-2017-DUP-2 | Total/NA | Water | 9056A | |
| 680-142501-14 | SB-2017-09-42-44 | Total/NA | Water | 9056A | |
| MB 680-493845/27 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-493845/28 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-493845/29 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-142501-14 MS | SB-2017-09-42-44 | Total/NA | Water | 9056A | |
| 680-142501-14 MSD | SB-2017-09-42-44 | Total/NA | Water | 9056A | |
| 680-142501-10 DU | SB-2017-08-94.6-96.6 | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 493247

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142501-1 | SB-2017-06-62-64 | Dissolved | Water | 3005A | |
| 680-142501-2 | SB-2017-08-27-29 | Dissolved | Water | 3005A | |
| 680-142501-3 | SB-2017-08-37-39 | Dissolved | Water | 3005A | |
| 680-142501-4 | SB-2017-08-47-49 | Dissolved | Water | 3005A | |
| 680-142501-5 | SB-2017-DUP-1 | Dissolved | Water | 3005A | |
| 680-142501-6 | SB-2017-08-57-59 | Dissolved | Water | 3005A | |
| 680-142501-7 | SB-2017-08-67-69 | Dissolved | Water | 3005A | |
| 680-142501-8 | SB-2017-08-77-79 | Dissolved | Water | 3005A | |
| 680-142501-9 | SB-2017-08-87-89 | Dissolved | Water | 3005A | |
| 680-142501-10 | SB-2017-08-94.6-96.6 | Dissolved | Water | 3005A | |
| 680-142501-11 | SB-2017-09-22-24 | Dissolved | Water | 3005A | |
| 680-142501-12 | SB-2017-09-32-34 | Dissolved | Water | 3005A | |
| 680-142501-13 | SB-2017-DUP-2 | Dissolved | Water | 3005A | |
| 680-142501-14 | SB-2017-09-42-44 | Dissolved | Water | 3005A | |
| MB 680-493247/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-493247/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

## Metals (Continued)

### Prep Batch: 493247 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142501-4 MS | SB-2017-08-47-49 | Dissolved | Water | 3005A | |
| 680-142501-4 MSD | SB-2017-08-47-49 | Dissolved | Water | 3005A | |
| 680-142501-14 MS | SB-2017-09-42-44 | Dissolved | Water | 3005A | |
| 680-142501-14 MSD | SB-2017-09-42-44 | Dissolved | Water | 3005A | |

### Prep Batch: 493249

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142501-1 | SB-2017-06-62-64 | Dissolved | Water | 3005A | |
| 680-142501-2 | SB-2017-08-27-29 | Dissolved | Water | 3005A | |
| 680-142501-3 | SB-2017-08-37-39 | Dissolved | Water | 3005A | |
| 680-142501-4 | SB-2017-08-47-49 | Dissolved | Water | 3005A | |
| 680-142501-5 | SB-2017-DUP-1 | Dissolved | Water | 3005A | |
| 680-142501-6 | SB-2017-08-57-59 | Dissolved | Water | 3005A | |
| 680-142501-7 | SB-2017-08-67-69 | Dissolved | Water | 3005A | |
| 680-142501-8 | SB-2017-08-77-79 | Dissolved | Water | 3005A | |
| 680-142501-9 | SB-2017-08-87-89 | Dissolved | Water | 3005A | |
| 680-142501-10 | SB-2017-08-94.6-96.6 | Dissolved | Water | 3005A | |
| 680-142501-11 | SB-2017-09-22-24 | Dissolved | Water | 3005A | |
| 680-142501-12 | SB-2017-09-32-34 | Dissolved | Water | 3005A | |
| 680-142501-13 | SB-2017-DUP-2 | Dissolved | Water | 3005A | |
| 680-142501-14 | SB-2017-09-42-44 | Dissolved | Water | 3005A | |
| MB 680-493249/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-493249/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-142501-4 MS | SB-2017-08-47-49 | Dissolved | Water | 3005A | |
| 680-142501-4 MSD | SB-2017-08-47-49 | Dissolved | Water | 3005A | |
| 680-142501-14 MS | SB-2017-09-42-44 | Dissolved | Water | 3005A | |
| 680-142501-14 MSD | SB-2017-09-42-44 | Dissolved | Water | 3005A | |

### Analysis Batch: 493494

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142501-1 | SB-2017-06-62-64 | Dissolved | Water | 6020A | 493247 |
| 680-142501-2 | SB-2017-08-27-29 | Dissolved | Water | 6020A | 493247 |
| 680-142501-3 | SB-2017-08-37-39 | Dissolved | Water | 6020A | 493247 |
| 680-142501-4 | SB-2017-08-47-49 | Dissolved | Water | 6020A | 493247 |
| 680-142501-5 | SB-2017-DUP-1 | Dissolved | Water | 6020A | 493247 |
| 680-142501-6 | SB-2017-08-57-59 | Dissolved | Water | 6020A | 493247 |
| 680-142501-7 | SB-2017-08-67-69 | Dissolved | Water | 6020A | 493247 |
| 680-142501-8 | SB-2017-08-77-79 | Dissolved | Water | 6020A | 493247 |
| 680-142501-9 | SB-2017-08-87-89 | Dissolved | Water | 6020A | 493247 |
| 680-142501-10 | SB-2017-08-94.6-96.6 | Dissolved | Water | 6020A | 493247 |
| 680-142501-11 | SB-2017-09-22-24 | Dissolved | Water | 6020A | 493247 |
| 680-142501-12 | SB-2017-09-32-34 | Dissolved | Water | 6020A | 493247 |
| 680-142501-13 | SB-2017-DUP-2 | Dissolved | Water | 6020A | 493247 |
| 680-142501-14 | SB-2017-09-42-44 | Dissolved | Water | 6020A | 493247 |
| MB 680-493247/1-A | Method Blank | Total Recoverable | Water | 6020A | 493247 |
| LCS 680-493247/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 493247 |
| 680-142501-4 MS | SB-2017-08-47-49 | Dissolved | Water | 6020A | 493247 |
| 680-142501-4 MSD | SB-2017-08-47-49 | Dissolved | Water | 6020A | 493247 |
| 680-142501-14 MS | SB-2017-09-42-44 | Dissolved | Water | 6020A | 493247 |
| 680-142501-14 MSD | SB-2017-09-42-44 | Dissolved | Water | 6020A | 493247 |

## Metals (Continued)

### Analysis Batch: 493827

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142501-1 | SB-2017-06-62-64 | Dissolved | Water | 6010C | 493249 |
| 680-142501-2 | SB-2017-08-27-29 | Dissolved | Water | 6010C | 493249 |
| 680-142501-3 | SB-2017-08-37-39 | Dissolved | Water | 6010C | 493249 |
| 680-142501-4 | SB-2017-08-47-49 | Dissolved | Water | 6010C | 493249 |
| 680-142501-5 | SB-2017-DUP-1 | Dissolved | Water | 6010C | 493249 |
| 680-142501-6 | SB-2017-08-57-59 | Dissolved | Water | 6010C | 493249 |
| 680-142501-7 | SB-2017-08-67-69 | Dissolved | Water | 6010C | 493249 |
| 680-142501-8 | SB-2017-08-77-79 | Dissolved | Water | 6010C | 493249 |
| 680-142501-9 | SB-2017-08-87-89 | Dissolved | Water | 6010C | 493249 |
| 680-142501-10 | SB-2017-08-94.6-96.6 | Dissolved | Water | 6010C | 493249 |
| 680-142501-11 | SB-2017-09-22-24 | Dissolved | Water | 6010C | 493249 |
| 680-142501-12 | SB-2017-09-32-34 | Dissolved | Water | 6010C | 493249 |
| 680-142501-13 | SB-2017-DUP-2 | Dissolved | Water | 6010C | 493249 |
| 680-142501-14 | SB-2017-09-42-44 | Dissolved | Water | 6010C | 493249 |
| MB 680-493249/1-A | Method Blank | Total Recoverable | Water | 6010C | 493249 |
| LCS 680-493249/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 493249 |
| 680-142501-4 MS | SB-2017-08-47-49 | Dissolved | Water | 6010C | 493249 |
| 680-142501-4 MSD | SB-2017-08-47-49 | Dissolved | Water | 6010C | 493249 |
| 680-142501-14 MS | SB-2017-09-42-44 | Dissolved | Water | 6010C | 493249 |
| 680-142501-14 MSD | SB-2017-09-42-44 | Dissolved | Water | 6010C | 493249 |

## General Chemistry

### Analysis Batch: 385928

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142501-1 | SB-2017-06-62-64 | Dissolved | Water | 9060 | |
| 680-142501-2 | SB-2017-08-27-29 | Dissolved | Water | 9060 | |
| 680-142501-3 | SB-2017-08-37-39 | Dissolved | Water | 9060 | |
| 680-142501-4 | SB-2017-08-47-49 | Dissolved | Water | 9060 | |
| 680-142501-5 | SB-2017-DUP-1 | Dissolved | Water | 9060 | |
| 680-142501-6 | SB-2017-08-57-59 | Dissolved | Water | 9060 | |
| 680-142501-7 | SB-2017-08-67-69 | Dissolved | Water | 9060 | |
| 680-142501-8 | SB-2017-08-77-79 | Dissolved | Water | 9060 | |
| 680-142501-9 | SB-2017-08-87-89 | Dissolved | Water | 9060 | |
| 680-142501-10 | SB-2017-08-94.6-96.6 | Dissolved | Water | 9060 | |
| 680-142501-11 | SB-2017-09-22-24 | Dissolved | Water | 9060 | |
| 680-142501-12 | SB-2017-09-32-34 | Dissolved | Water | 9060 | |
| 680-142501-13 | SB-2017-DUP-2 | Dissolved | Water | 9060 | |
| 680-142501-14 | SB-2017-09-42-44 | Dissolved | Water | 9060 | |
| MB 280-385928/35 | Method Blank | Dissolved | Water | 9060 | |
| LCS 280-385928/34 | Lab Control Sample | Dissolved | Water | 9060 | |
| 680-142501-4 MS | SB-2017-08-47-49 | Dissolved | Water | 9060 | |
| 680-142501-4 MSD | SB-2017-08-47-49 | Dissolved | Water | 9060 | |
| 680-142501-14 MS | SB-2017-09-42-44 | Dissolved | Water | 9060 | |
| 680-142501-14 MSD | SB-2017-09-42-44 | Dissolved | Water | 9060 | |

### Analysis Batch: 386093

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142501-1 | SB-2017-06-62-64 | Total/NA | Water | SM 2320B | |
| 680-142501-2 | SB-2017-08-27-29 | Total/NA | Water | SM 2320B | |

## General Chemistry (Continued)

### Analysis Batch: 386093 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142501-3 | SB-2017-08-37-39 | Total/NA | Water | SM 2320B | |
| 680-142501-4 | SB-2017-08-47-49 | Total/NA | Water | SM 2320B | |
| 680-142501-5 | SB-2017-DUP-1 | Total/NA | Water | SM 2320B | |
| 680-142501-6 | SB-2017-08-57-59 | Total/NA | Water | SM 2320B | |
| 680-142501-7 | SB-2017-08-67-69 | Total/NA | Water | SM 2320B | |
| 680-142501-8 | SB-2017-08-77-79 | Total/NA | Water | SM 2320B | |
| 680-142501-10 | SB-2017-08-94.6-96.6 | Total/NA | Water | SM 2320B | |
| 680-142501-11 | SB-2017-09-22-24 | Total/NA | Water | SM 2320B | |
| 680-142501-12 | SB-2017-09-32-34 | Total/NA | Water | SM 2320B | |
| 680-142501-13 | SB-2017-DUP-2 | Total/NA | Water | SM 2320B | |
| 680-142501-14 | SB-2017-09-42-44 | Total/NA | Water | SM 2320B | |
| MB 280-386093/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-386093/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 680-142501-1 DU | SB-2017-06-62-64 | Total/NA | Water | SM 2320B | |

### Analysis Batch: 386182

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142501-9 | SB-2017-08-87-89 | Total/NA | Water | SM 2320B | |
| MB 280-386182/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-386182/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## Client Sample ID: SB-2017-06-62-64

**Lab Sample ID: 680-142501-1**

**Date Collected: 08/21/17 10:00**

**Matrix: Water**

**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493770 | 09/01/17 02:33 | ALR | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 17:51 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 17:46 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/28/17 21:02 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386093 | 08/29/17 17:42 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-08-27-29

**Lab Sample ID: 680-142501-2**

**Date Collected: 08/21/17 13:15**

**Matrix: Water**

**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493770 | 09/01/17 02:51 | ALR | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 17:30 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 17:31 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/28/17 21:17 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386093 | 08/29/17 17:54 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-08-37-39

**Lab Sample ID: 680-142501-3**

**Date Collected: 08/21/17 14:40**

**Matrix: Water**

**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493770 | 09/01/17 03:09 | ALR | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 16:44 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## Client Sample ID: SB-2017-08-37-39

**Lab Sample ID: 680-142501-3**

**Date Collected: 08/21/17 14:40**

**Matrix: Water**

**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 17:03 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/28/17 22:05 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386093 | 08/29/17 18:00 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-08-47-49

**Lab Sample ID: 680-142501-4**

**Date Collected: 08/21/17 16:00**

**Matrix: Water**

**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493770 | 09/01/17 03:27 | ALR | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 15:52 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 16:26 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/28/17 22:22 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386093 | 08/29/17 18:05 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-DUP-1

**Lab Sample ID: 680-142501-5**

**Date Collected: 08/21/17 16:10**

**Matrix: Water**

**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493770 | 09/01/17 04:21 | ALR | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 17:56 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 17:49 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/28/17 23:08 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386093 | 08/29/17 18:11 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## Client Sample ID: SB-2017-08-57-59

**Lab Sample ID: 680-142501-6**

**Date Collected: 08/22/17 09:15**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493770 | 09/01/17 05:33 | ALR | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 17:15 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 17:24 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/28/17 23:25 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386093 | 08/29/17 18:16 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-08-67-69

**Lab Sample ID: 680-142501-7**

**Date Collected: 08/22/17 10:55**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493770 | 09/01/17 05:51 | ALR | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 17:20 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 17:28 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/28/17 23:39 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386093 | 08/29/17 18:22 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-08-77-79

**Lab Sample ID: 680-142501-8**

**Date Collected: 08/22/17 12:40**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493770 | 09/01/17 06:09 | ALR | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 16:49 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 17:06 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/28/17 23:54 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386093 | 08/29/17 18:27 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-08-87-89 — Lab Sample ID: 680-142501-9

**Date Collected: 08/22/17 16:10** — **Matrix: Water**
**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493770 | 09/01/17 06:27 | ALR | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 16:54 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 17:10 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/29/17 00:11 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386182 | 08/30/17 14:30 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-08-94.6-96.6 — Lab Sample ID: 680-142501-10

**Date Collected: 08/23/17 10:25** — **Matrix: Water**
**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493845 | 09/01/17 21:55 | UI | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 17:46 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 17:35 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/29/17 00:25 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386093 | 08/29/17 18:33 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-09-22-24 — Lab Sample ID: 680-142501-11

**Date Collected: 08/23/17 14:05** — **Matrix: Water**
**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493845 | 09/01/17 22:31 | UI | TAL SAV |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## Client Sample ID: SB-2017-09-22-24

**Lab Sample ID: 680-142501-11**

**Date Collected: 08/23/17 14:05**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493845 | 09/01/17 22:31 | UI | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 17:09 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 17:20 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/29/17 01:11 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386093 | 08/29/17 18:52 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-09-32-34

**Lab Sample ID: 680-142501-12**

**Date Collected: 08/23/17 15:30**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493845 | 09/01/17 22:49 | UI | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 16:59 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 17:13 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/29/17 01:26 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386093 | 08/29/17 18:57 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-DUP-2

**Lab Sample ID: 680-142501-13**

**Date Collected: 08/23/17 15:35**
**Matrix: Water**
**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493845 | 09/01/17 23:07 | UI | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 17:04 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 17:17 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/29/17 01:44 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386093 | 08/29/17 19:02 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-09-42-44

## Lab Sample ID: 680-142501-14

**Date Collected: 08/23/17 09:45**

**Matrix: Water**

**Date Received: 08/25/17 09:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493845 | 09/01/17 21:01 | UI | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 16:07 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 16:44 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/29/17 01:59 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386093 | 08/29/17 19:08 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

360325-Boston

360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 1 of: 2

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation

Sampler(s) Signature(s)

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-06-62-64 | 8/21/17 | 1000 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-08-27-29 | 8/21/17 | 1315 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-08-37-39 | 8/21/17 | 1440 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-08-47-49 | 8/21/17 | 1600 | GW | 4 12 | ✓ | ✓ | ✓ | ✓ | MS/MSD ✗ | |
| SB-2017-DUP-1 | 8/21/17 | 1610 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-08-57-59 | 8/22/17 | 915 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-08-67-69 | 8/22/17 | 1055 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-08-77-79 | 8/22/17 | 1240 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-08-87-89 | 8/22/17 | 1610 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |

680-142501-01 Chain of Custody

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: Via: | Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|
| Returned: Via: | | | 8/24/17 | 1340 | | 8-24-17 | 1341 |
| Additional Comments: | | | 8-24-17 | 1800 | | | |
| * = Dissolved Metals include: Fe, Mn (6010); As (6020) | | | | | MTR | 8/25/17 | 405 |

email logins and results to:

lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐

On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | |
|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

0.6°C (CR) 0.8°C

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 2 of: 2

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation: Kevin B. Anderson

Sampler(s) Signature(s): [signature]

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017- 08-94.6-96.6 | 8/23/17 | 1025 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017- 09-22-24 | 8/23/17 | 1405 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017- 09-32-34 | 8/23/17 | 1530 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017- DUP-2 | 8/23/17 | 1535 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017- 09-42-44 | 8/24/17 | 945 | GW | 12 | ✓ | ✓ | ✓ | ✓ | | | | | | | MS/MSD ☆ | |
| SB-2017- | | | GW | | | | | | | | | | | | | |

680-142501-02 Chain of Custody

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | [signature] | 8/24/17 | 1340 | | [signature] | 8-24-17 | 1841 |
| Additional Comments: | | | [signature] | 8-24-17 | 1800 | | | | |
| * = Dissolved Metals include: Fe, Mn (6010); As (6020) | | | | | | | M Tyl | 8/25/17 | 907 |

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal # _____ Preserve Where Applicable ☐ On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

0.6°C (CF) 0.8°C

# Login Sample Receipt Checklist

Client: KOMAN Government Solutions, LLC

Job Number: 680-142501-1

**Login Number: 142501**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: Ragnaldsen, Amy E**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | N/A | |
| Residual Chlorine Checked. | N/A | |

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| | AFCEE | | SAVLAB | |
| Alabama | State Program | 4 | 41450 | 06-30-18 |
| Alaska | State Program | 10 | | 06-30-18 |
| Alaska (UST) | State Program | 10 | UST-104 | 11-05-17 * |
| Arizona | State Program | 9 | AZ808 | 12-14-17 |
| Arkansas DEQ | State Program | 6 | 88-0692 | 02-01-18 |
| California | State Program | 9 | 2939 | 06-30-17 * |
| Colorado | State Program | 8 | N/A | 12-31-17 |
| Connecticut | State Program | 1 | PH-0161 | 03-31-19 |
| Florida | NELAP | 4 | E87052 | 06-30-18 |
| GA Dept. of Agriculture | State Program | 4 | N/A | 06-12-18 |
| Georgia | State Program | 4 | 803 | 06-30-18 |
| Guam | State Program | 9 | 15-005r | 04-16-18 |
| Hawaii | State Program | 9 | N/A | 06-30-18 |
| Illinois | NELAP | 5 | 200022 | 11-30-17 |
| Indiana | State Program | 5 | N/A | 06-30-18 |
| Iowa | State Program | 7 | 353 | 06-30-19 |
| Kentucky (DW) | State Program | 4 | 90084 | 12-31-17 |
| Kentucky (UST) | State Program | 4 | 18 | 06-30-18 |
| Kentucky (WW) | State Program | 4 | 90084 | 12-31-17 |
| L-A-B | DoD ELAP | | L2463 | 09-22-19 |
| L-A-B | ISO/IEC 17025 | | L2463.01 | 09-22-19 |
| Louisiana | NELAP | 6 | 30690 | 06-30-18 |
| Louisiana (DW) | NELAP | 6 | LA160019 | 12-31-17 |
| Maine | State Program | 1 | GA00006 | 09-24-18 |
| Maryland | State Program | 3 | 250 | 12-31-17 |
| Massachusetts | State Program | 1 | M-GA006 | 06-30-18 |
| Michigan | State Program | 5 | 9925 | 06-30-17 * |
| Mississippi | State Program | 4 | N/A | 06-30-18 |
| Nebraska | State Program | 7 | TestAmerica-Savannah | 06-30-18 |
| New Jersey | NELAP | 2 | GA769 | 06-30-18 |
| New Mexico | State Program | 6 | N/A | 06-30-18 |
| New York | NELAP | 2 | 10842 | 03-31-18 |
| North Carolina (DW) | State Program | 4 | 13701 | 07-31-18 |
| North Carolina (WW/SW) | State Program | 4 | 269 | 12-31-17 |
| Oklahoma | State Program | 6 | 9984 | 08-31-18 |
| Pennsylvania | NELAP | 3 | 68-00474 | 06-30-18 |
| Puerto Rico | State Program | 2 | GA00006 | 12-31-17 |
| South Carolina | State Program | 4 | 98001 | 06-30-17 * |
| Tennessee | State Program | 4 | TN02961 | 06-30-18 |
| Texas | NELAP | 6 | T104704185-16-9 | 11-30-17 |
| US Fish & Wildlife | Federal | | LE058448-0 | 07-31-18 |
| USDA | Federal | | SAV 3-04 | 06-14-20 * |
| Virginia | NELAP | 3 | 460161 | 06-14-18 |
| Washington | State Program | 10 | C805 | 06-10-18 |
| West Virginia (DW) | State Program | 3 | 9950C | 12-31-17 |
| West Virginia DEP | State Program | 3 | 094 | 06-30-18 |
| Wisconsin | State Program | 5 | 999819810 | 08-31-17 * |
| Wyoming | State Program | 8 | 8TMS-L | 06-30-16 * |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142501-1

## Laboratory: TestAmerica Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

TestAmerica Job ID: 680-142532-1
Client Project/Site: Devens - SHL EPA SOW Phase 1

For:
KOMAN Government Solutions, LLC
293 Boston Post Road
Suite 100
Marlborough, Massachusetts 01752

Attn: Laurie Ekes

*Authorized for release by:*
*9/7/2017 4:28:22 PM*

Jerry Lanier, Project Manager I
(912)354-7858 e.3410
jerry.lanier@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Job ID: 680-142532-1

**Laboratory: TestAmerica Savannah**

**Narrative**

# CASE NARRATIVE

## Client: KOMAN Government Solutions, LLC

## Project: Devens - SHL EPA SOW Phase 1

## Report Number: 680-142532-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 08/26/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.6º C and 1.2º C.

**METALS (ICP) - DISSOLVED**
Samples SB-2017-09-52-54 (680-142532-1), SB-2017-09-62-64 (680-142532-2), SB-2017-10-22-24 (680-142532-3), SB-2017-10-32-34 (680-142532-4), SB-2017-10-42-44 (680-142532-5), SB-2017-DUP-3 (680-142532-6), SB-2017-10-52-54 (680-142532-7) and SB-2017-10-62-64 (680-142532-8) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 08/28/2017 and 08/30/2017 and analyzed on 08/31/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples SB-2017-09-52-54 (680-142532-1), SB-2017-09-62-64 (680-142532-2), SB-2017-10-22-24 (680-142532-3), SB-2017-10-32-34 (680-142532-4), SB-2017-10-42-44 (680-142532-5), SB-2017-DUP-3 (680-142532-6), SB-2017-10-52-54 (680-142532-7) and SB-2017-10-62-64 (680-142532-8) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 08/28/2017 and 08/30/2017 and analyzed on 08/29/2017 and 08/31/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples SB-2017-09-52-54 (680-142532-1), SB-2017-09-62-64 (680-142532-2), SB-2017-10-22-24 (680-142532-3), SB-2017-10-32-34 (680-142532-4), SB-2017-10-42-44 (680-142532-5), SB-2017-DUP-3 (680-142532-6), SB-2017-10-52-54 (680-142532-7) and SB-2017-10-62-64 (680-142532-8) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 08/30/2017.

The method blank for method 2320B analytical batch 280-386182, and 280-386230 contained alkalinity above the method detection limit (MDL). Associated sample(s) were not re-analyzed because results were greater than 10X the value found in the method blank.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**
Samples SB-2017-09-52-54 (680-142532-1), SB-2017-09-62-64 (680-142532-2), SB-2017-10-22-24 (680-142532-3), SB-2017-10-32-34 (680-142532-4), SB-2017-10-42-44 (680-142532-5), SB-2017-DUP-3 (680-142532-6), SB-2017-10-52-54 (680-142532-7) and SB-2017-10-62-64 (680-142532-8) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 08/29/2017, 09/01/2017 and 09/02/2017.

## Job ID: 680-142532-1 (Continued)

### Laboratory: TestAmerica Savannah (Continued)

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**DISSOLVED ORGANIC CARBON**

Samples SB-2017-09-52-54 (680-142532-1), SB-2017-09-62-64 (680-142532-2), SB-2017-10-22-24 (680-142532-3), SB-2017-10-32-34 (680-142532-4), SB-2017-10-42-44 (680-142532-5), SB-2017-DUP-3 (680-142532-6), SB-2017-10-52-54 (680-142532-7) and SB-2017-10-62-64 (680-142532-8) were analyzed for dissolved organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 08/29/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142532-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 680-142532-1 | SB-2017-09-52-54 | Water | 08/24/17 12:10 | 08/26/17 08:45 |
| 680-142532-2 | SB-2017-09-62-64 | Water | 08/24/17 13:50 | 08/26/17 08:45 |
| 680-142532-3 | SB-2017-10-22-24 | Water | 08/24/17 16:10 | 08/26/17 08:45 |
| 680-142532-4 | SB-2017-10-32-34 | Water | 08/25/17 09:15 | 08/26/17 08:45 |
| 680-142532-5 | SB-2017-10-42-44 | Water | 08/25/17 10:50 | 08/26/17 08:45 |
| 680-142532-6 | SB-2017-DUP-3 | Water | 08/25/17 11:00 | 08/26/17 08:45 |
| 680-142532-7 | SB-2017-10-52-54 | Water | 08/25/17 12:50 | 08/26/17 08:45 |
| 680-142532-8 | SB-2017-10-62-64 | Water | 08/25/17 14:15 | 08/26/17 08:45 |

# Method Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142532-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060 | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| U | Undetected at the Limit of Detection. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142532-1

## Client Sample ID: SB-2017-09-52-54

**Lab Sample ID: 680-142532-1**

**Date Collected: 08/24/17 12:10**
**Matrix: Water**
**Date Received: 08/26/17 08:45**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 38 | | 0.50 | 0.50 | 0.20 | mg/L | | 08/29/17 15:17 | 1 |
| Sulfate | 2.5 | M | 1.0 | 1.0 | 0.40 | mg/L | | 08/29/17 15:17 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 72000 | | 50 | 50 | 17 | ug/L | | 08/31/17 18:02 | 1 |
| Manganese | 3200 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 18:02 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 140 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 17:53 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 450 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/30/17 15:31 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 8.5 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 02:45 | 1 |

## Client Sample ID: SB-2017-09-62-64

**Lab Sample ID: 680-142532-2**

**Date Collected: 08/24/17 13:50**
**Matrix: Water**
**Date Received: 08/26/17 08:45**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 22 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 23:25 | 1 |
| Sulfate | 9.6 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 23:25 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 98000 | | 50 | 50 | 17 | ug/L | | 08/31/17 19:20 | 1 |
| Manganese | 1900 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 19:20 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 900 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/31/17 16:41 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 240 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/30/17 15:24 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.3 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 03:04 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142532-1

## Client Sample ID: SB-2017-10-22-24

**Lab Sample ID: 680-142532-3**

**Date Collected: 08/24/17 16:10**
**Matrix: Water**
**Date Received: 08/26/17 08:45**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 21 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/02/17 00:19 | 1 |
| Sulfate | 1.0 | U M | 1.0 | 1.0 | 0.40 | mg/L | | 09/02/17 00:19 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 26000 | | 50 | 50 | 17 | ug/L | | 08/31/17 18:07 | 1 |
| Manganese | 1300 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 18:07 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 10 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 17:57 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 360 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/30/17 15:37 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 21 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 03:19 | 1 |

## Client Sample ID: SB-2017-10-32-34

**Lab Sample ID: 680-142532-4**

**Date Collected: 08/25/17 09:15**
**Matrix: Water**
**Date Received: 08/26/17 08:45**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.5 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/02/17 00:37 | 1 |
| Sulfate | 5.0 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/02/17 00:37 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 18000 | | 50 | 50 | 17 | ug/L | | 08/31/17 18:18 | 1 |
| Manganese | 830 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 18:18 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 87 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 18:04 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 79 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/30/17 15:42 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 5.2 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 03:34 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142532-1

## Client Sample ID: SB-2017-10-42-44

**Lab Sample ID: 680-142532-5**

**Date Collected: 08/25/17 10:50**
**Matrix: Water**
**Date Received: 08/26/17 08:45**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/02/17 00:55 | 1 |
| Sulfate | 5.0 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/02/17 00:55 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 75000 | | 50 | 50 | 17 | ug/L | | 08/31/17 18:12 | 1 |
| Manganese | 2400 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 18:12 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 25 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 18:00 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 270 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/30/17 20:31 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 7.6 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 04:22 | 1 |

## Client Sample ID: SB-2017-DUP-3

**Lab Sample ID: 680-142532-6**

**Date Collected: 08/25/17 11:00**
**Matrix: Water**
**Date Received: 08/26/17 08:45**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/02/17 01:13 | 1 |
| Sulfate | 4.9 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/02/17 01:13 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 73000 | | 50 | 50 | 17 | ug/L | | 08/31/17 19:25 | 1 |
| Manganese | 2300 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 19:25 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 24 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/31/17 16:45 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 290 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/30/17 14:36 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 7.6 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 04:42 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142532-1

## Client Sample ID: SB-2017-10-52-54

**Lab Sample ID: 680-142532-7**

**Date Collected: 08/25/17 12:50**
**Matrix: Water**
**Date Received: 08/26/17 08:45**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 45 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/02/17 01:31 | 1 |
| Sulfate | 4.9 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/02/17 01:31 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 15000 | | 50 | 50 | 17 | ug/L | | 08/31/17 19:30 | 1 |
| Manganese | 4800 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 19:30 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 33 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/31/17 16:52 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 250 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/30/17 14:53 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 4.8 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 17:07 | 1 |

## Client Sample ID: SB-2017-10-62-64

**Lab Sample ID: 680-142532-8**

**Date Collected: 08/25/17 14:15**
**Matrix: Water**
**Date Received: 08/26/17 08:45**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 24 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/02/17 03:01 | 1 |
| Sulfate | 19 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/02/17 03:01 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 75000 | | 50 | 50 | 17 | ug/L | | 08/31/17 18:23 | 1 |
| Manganese | 670 | | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 18:23 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1600 | | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 18:07 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 120 | B | 5.0 | 3.2 | 1.1 | mg/L | | 08/30/17 21:19 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.3 | | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 17:52 | 1 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-493277/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493277**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 08/29/17 09:15 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 08/29/17 09:15 | 1 |

**Lab Sample ID: LCS 680-493277/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493277**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.97 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: LCSD 680-493277/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493277**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.99 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.2 | | mg/L | | 102 | 87 - 112 | 1 | 15 |

**Lab Sample ID: MB 680-493845/27** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493845**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 09/01/17 16:13 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 09/01/17 16:13 | 1 |

**Lab Sample ID: LCS 680-493845/28** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493845**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.93 | | mg/L | | 99 | 87 - 111 |
| Sulfate | 10.0 | 10.0 | | mg/L | | 100 | 87 - 112 |

**Lab Sample ID: LCSD 680-493845/29** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493845**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.93 | | mg/L | | 99 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 | 1 | 15 |

**Lab Sample ID: MB 680-493846/60** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493846**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 09/02/17 02:07 | 1 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: MB 680-493846/60** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493846**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 09/02/17 02:07 | 1 |

**Lab Sample ID: LCS 680-493846/61** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493846**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.91 | | mg/L | | 99 | 87 - 111 |
| Sulfate | 10.0 | 9.65 | | mg/L | | 97 | 87 - 112 |

**Lab Sample ID: LCSD 680-493846/62** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493846**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.93 | | mg/L | | 99 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 9.77 | | mg/L | | 98 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-142532-8 MS** — **Client Sample ID: SB-2017-10-62-64**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493846**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 24 | | 10.0 | 35.1 | | mg/L | | 110 | 87 - 111 |
| Sulfate | 19 | M | 10.0 | 29.6 | | mg/L | | 107 | 87 - 112 |

**Lab Sample ID: 680-142532-8 MSD** — **Client Sample ID: SB-2017-10-62-64**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493846**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 24 | | 10.0 | 35.0 | | mg/L | | 109 | 87 - 111 | 0 | 15 |
| Sulfate | 19 | M | 10.0 | 29.6 | M | mg/L | | 107 | 87 - 112 | 0 | 15 |

**Lab Sample ID: 680-142532-8 DU** — **Client Sample ID: SB-2017-10-62-64**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 493846**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Chloride | 24 | | 24.4 | | mg/L | | 1 | 15 |
| Sulfate | 19 | M | 19.1 | M | mg/L | | 1 | 15 |

# QC Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142532-1

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-493249/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 493827** — **Prep Batch: 493249**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 08/31/17 15:41 | 1 |
| Manganese | 3.0 | U | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 15:41 | 1 |

**Lab Sample ID: LCS 680-493249/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 493827** — **Prep Batch: 493249**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 5130 | | ug/L | | 103 | 87 - 115 |
| Manganese | 500 | 542 | | ug/L | | 108 | 90 - 114 |

**Lab Sample ID: MB 680-493515/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 493827** — **Prep Batch: 493515**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 08/31/17 18:28 | 1 |
| Manganese | 3.0 | U | 10 | 3.0 | 1.0 | ug/L | | 08/31/17 18:28 | 1 |

**Lab Sample ID: LCS 680-493515/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 493827** — **Prep Batch: 493515**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 5190 | | ug/L | | 104 | 87 - 115 |
| Manganese | 500 | 549 | | ug/L | | 110 | 90 - 114 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-493247/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 493494** — **Prep Batch: 493247**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 08/29/17 16:19 | 1 |

**Lab Sample ID: LCS 680-493247/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 493494** — **Prep Batch: 493247**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 106 | | ug/L | | 106 | 84 - 116 |

**Lab Sample ID: MB 680-493511/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 493787** — **Prep Batch: 493511**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 08/31/17 15:47 | 1 |

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: LCS 680-493511/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 493787** — **Prep Batch: 493511**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 104 | | ug/L | | 104 | 84 - 116 |

## Method: 9060 - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-385928/35** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 385928**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 08/28/17 20:31 | 1 |

**Lab Sample ID: LCS 280-385928/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 385928**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 25.0 | 23.6 | | mg/L | | 94 | 88 - 112 |

**Lab Sample ID: MB 280-386074/18** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 386074**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 15:07 | 1 |

**Lab Sample ID: MB 280-386074/51** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 386074**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 08/29/17 23:44 | 1 |

**Lab Sample ID: LCS 280-386074/17** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 386074**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 25.0 | 24.8 | | mg/L | | 99 | 88 - 112 |

**Lab Sample ID: LCS 280-386074/50** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 386074**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 25.0 | 25.1 | | mg/L | | 100 | 88 - 112 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-386182/5** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386182**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.16 | J | 5.0 | 3.2 | 1.1 | mg/L | | 08/30/17 13:35 | 1 |

**Lab Sample ID: LCS 280-386182/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386182**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 193 | | mg/L | | 96 | 90 - 110 |

**Lab Sample ID: MB 280-386230/31** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386230**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.01 | J | 5.0 | 3.2 | 1.1 | mg/L | | 08/30/17 20:25 | 1 |

**Lab Sample ID: LCS 280-386230/30** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386230**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 191 | | mg/L | | 96 | 90 - 110 |

**Lab Sample ID: 680-142532-5 DU** — **Client Sample ID: SB-2017-10-42-44**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 386230**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Alkalinity | 270 | B | 259 | | mg/L | | 3 | 10 |

# QC Association Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142532-1

## HPLC/IC

### Analysis Batch: 493277

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142532-1 | SB-2017-09-52-54 | Total/NA | Water | 9056A | |
| MB 680-493277/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-493277/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-493277/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |

### Analysis Batch: 493845

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142532-2 | SB-2017-09-62-64 | Total/NA | Water | 9056A | |
| 680-142532-3 | SB-2017-10-22-24 | Total/NA | Water | 9056A | |
| 680-142532-4 | SB-2017-10-32-34 | Total/NA | Water | 9056A | |
| 680-142532-5 | SB-2017-10-42-44 | Total/NA | Water | 9056A | |
| 680-142532-6 | SB-2017-DUP-3 | Total/NA | Water | 9056A | |
| 680-142532-7 | SB-2017-10-52-54 | Total/NA | Water | 9056A | |
| MB 680-493845/27 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-493845/28 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-493845/29 | Lab Control Sample Dup | Total/NA | Water | 9056A | |

### Analysis Batch: 493846

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142532-8 | SB-2017-10-62-64 | Total/NA | Water | 9056A | |
| MB 680-493846/60 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-493846/61 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-493846/62 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-142532-8 MS | SB-2017-10-62-64 | Total/NA | Water | 9056A | |
| 680-142532-8 MSD | SB-2017-10-62-64 | Total/NA | Water | 9056A | |
| 680-142532-8 DU | SB-2017-10-62-64 | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 493247

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142532-1 | SB-2017-09-52-54 | Dissolved | Water | 3005A | |
| 680-142532-3 | SB-2017-10-22-24 | Dissolved | Water | 3005A | |
| 680-142532-4 | SB-2017-10-32-34 | Dissolved | Water | 3005A | |
| 680-142532-5 | SB-2017-10-42-44 | Dissolved | Water | 3005A | |
| 680-142532-8 | SB-2017-10-62-64 | Dissolved | Water | 3005A | |
| MB 680-493247/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-493247/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 493249

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142532-1 | SB-2017-09-52-54 | Dissolved | Water | 3005A | |
| 680-142532-3 | SB-2017-10-22-24 | Dissolved | Water | 3005A | |
| 680-142532-4 | SB-2017-10-32-34 | Dissolved | Water | 3005A | |
| 680-142532-5 | SB-2017-10-42-44 | Dissolved | Water | 3005A | |
| 680-142532-8 | SB-2017-10-62-64 | Dissolved | Water | 3005A | |
| MB 680-493249/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-493249/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

## Metals (Continued)

### Analysis Batch: 493494

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142532-1 | SB-2017-09-52-54 | Dissolved | Water | 6020A | 493247 |
| 680-142532-3 | SB-2017-10-22-24 | Dissolved | Water | 6020A | 493247 |
| 680-142532-4 | SB-2017-10-32-34 | Dissolved | Water | 6020A | 493247 |
| 680-142532-5 | SB-2017-10-42-44 | Dissolved | Water | 6020A | 493247 |
| 680-142532-8 | SB-2017-10-62-64 | Dissolved | Water | 6020A | 493247 |
| MB 680-493247/1-A | Method Blank | Total Recoverable | Water | 6020A | 493247 |
| LCS 680-493247/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 493247 |

### Prep Batch: 493511

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142532-2 | SB-2017-09-62-64 | Dissolved | Water | 3005A | |
| 680-142532-6 | SB-2017-DUP-3 | Dissolved | Water | 3005A | |
| 680-142532-7 | SB-2017-10-52-54 | Dissolved | Water | 3005A | |
| MB 680-493511/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-493511/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 493515

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142532-2 | SB-2017-09-62-64 | Dissolved | Water | 3005A | |
| 680-142532-6 | SB-2017-DUP-3 | Dissolved | Water | 3005A | |
| 680-142532-7 | SB-2017-10-52-54 | Dissolved | Water | 3005A | |
| MB 680-493515/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-493515/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Analysis Batch: 493787

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142532-2 | SB-2017-09-62-64 | Dissolved | Water | 6020A | 493511 |
| 680-142532-6 | SB-2017-DUP-3 | Dissolved | Water | 6020A | 493511 |
| 680-142532-7 | SB-2017-10-52-54 | Dissolved | Water | 6020A | 493511 |
| MB 680-493511/1-A | Method Blank | Total Recoverable | Water | 6020A | 493511 |
| LCS 680-493511/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 493511 |

### Analysis Batch: 493827

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142532-1 | SB-2017-09-52-54 | Dissolved | Water | 6010C | 493249 |
| 680-142532-2 | SB-2017-09-62-64 | Dissolved | Water | 6010C | 493515 |
| 680-142532-3 | SB-2017-10-22-24 | Dissolved | Water | 6010C | 493249 |
| 680-142532-4 | SB-2017-10-32-34 | Dissolved | Water | 6010C | 493249 |
| 680-142532-5 | SB-2017-10-42-44 | Dissolved | Water | 6010C | 493249 |
| 680-142532-6 | SB-2017-DUP-3 | Dissolved | Water | 6010C | 493515 |
| 680-142532-7 | SB-2017-10-52-54 | Dissolved | Water | 6010C | 493515 |
| 680-142532-8 | SB-2017-10-62-64 | Dissolved | Water | 6010C | 493249 |
| MB 680-493249/1-A | Method Blank | Total Recoverable | Water | 6010C | 493249 |
| MB 680-493515/1-A | Method Blank | Total Recoverable | Water | 6010C | 493515 |
| LCS 680-493249/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 493249 |
| LCS 680-493515/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 493515 |

# QC Association Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142532-1

## General Chemistry

### Analysis Batch: 385928

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142532-1 | SB-2017-09-52-54 | Dissolved | Water | 9060 | |
| 680-142532-2 | SB-2017-09-62-64 | Dissolved | Water | 9060 | |
| 680-142532-3 | SB-2017-10-22-24 | Dissolved | Water | 9060 | |
| 680-142532-4 | SB-2017-10-32-34 | Dissolved | Water | 9060 | |
| 680-142532-5 | SB-2017-10-42-44 | Dissolved | Water | 9060 | |
| 680-142532-6 | SB-2017-DUP-3 | Dissolved | Water | 9060 | |
| MB 280-385928/35 | Method Blank | Dissolved | Water | 9060 | |
| LCS 280-385928/34 | Lab Control Sample | Dissolved | Water | 9060 | |

### Analysis Batch: 386074

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142532-7 | SB-2017-10-52-54 | Dissolved | Water | 9060 | |
| 680-142532-8 | SB-2017-10-62-64 | Dissolved | Water | 9060 | |
| MB 280-386074/18 | Method Blank | Dissolved | Water | 9060 | |
| MB 280-386074/51 | Method Blank | Dissolved | Water | 9060 | |
| LCS 280-386074/17 | Lab Control Sample | Dissolved | Water | 9060 | |
| LCS 280-386074/50 | Lab Control Sample | Dissolved | Water | 9060 | |

### Analysis Batch: 386182

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142532-1 | SB-2017-09-52-54 | Total/NA | Water | SM 2320B | |
| 680-142532-2 | SB-2017-09-62-64 | Total/NA | Water | SM 2320B | |
| 680-142532-3 | SB-2017-10-22-24 | Total/NA | Water | SM 2320B | |
| 680-142532-4 | SB-2017-10-32-34 | Total/NA | Water | SM 2320B | |
| 680-142532-6 | SB-2017-DUP-3 | Total/NA | Water | SM 2320B | |
| 680-142532-7 | SB-2017-10-52-54 | Total/NA | Water | SM 2320B | |
| MB 280-386182/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-386182/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Analysis Batch: 386230

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-142532-5 | SB-2017-10-42-44 | Total/NA | Water | SM 2320B | |
| 680-142532-8 | SB-2017-10-62-64 | Total/NA | Water | SM 2320B | |
| MB 280-386230/31 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-386230/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 680-142532-5 DU | SB-2017-10-42-44 | Total/NA | Water | SM 2320B | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142532-1

## Client Sample ID: SB-2017-09-52-54

**Lab Sample ID: 680-142532-1**

**Date Collected: 08/24/17 12:10**

**Matrix: Water**

**Date Received: 08/26/17 08:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493277 | 08/29/17 15:17 | UI | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 18:02 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 17:53 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/29/17 02:45 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386182 | 08/30/17 15:31 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-09-62-64

**Lab Sample ID: 680-142532-2**

**Date Collected: 08/24/17 13:50**

**Matrix: Water**

**Date Received: 08/26/17 08:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493845 | 09/01/17 23:25 | UI | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493515 | 08/30/17 10:35 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 19:20 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493511 | 08/30/17 10:35 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493787 | 08/31/17 16:41 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/29/17 03:04 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386182 | 08/30/17 15:24 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-10-22-24

**Lab Sample ID: 680-142532-3**

**Date Collected: 08/24/17 16:10**

**Matrix: Water**

**Date Received: 08/26/17 08:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493845 | 09/02/17 00:19 | UI | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 18:07 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142532-1

## Client Sample ID: SB-2017-10-22-24

**Lab Sample ID: 680-142532-3**

**Date Collected: 08/24/17 16:10**

**Matrix: Water**

**Date Received: 08/26/17 08:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 17:57 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/29/17 03:19 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386182 | 08/30/17 15:37 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-10-32-34

**Lab Sample ID: 680-142532-4**

**Date Collected: 08/25/17 09:15**

**Matrix: Water**

**Date Received: 08/26/17 08:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493845 | 09/02/17 00:37 | UI | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 18:18 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 18:04 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/29/17 03:34 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386182 | 08/30/17 15:42 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-10-42-44

**Lab Sample ID: 680-142532-5**

**Date Collected: 08/25/17 10:50**

**Matrix: Water**

**Date Received: 08/26/17 08:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493845 | 09/02/17 00:55 | UI | TAL SAV |
| | Instrument ID: | CICL | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 18:12 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 18:00 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/29/17 04:22 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386230 | 08/30/17 20:31 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

## Client Sample ID: SB-2017-DUP-3

**Lab Sample ID: 680-142532-6**

**Date Collected: 08/25/17 11:00**

**Matrix: Water**

**Date Received: 08/26/17 08:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493845 | 09/02/17 01:13 | UI | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493515 | 08/30/17 10:35 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 19:25 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493511 | 08/30/17 10:35 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493787 | 08/31/17 16:45 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 385928 | 08/29/17 04:42 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386182 | 08/30/17 14:36 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-10-52-54

**Lab Sample ID: 680-142532-7**

**Date Collected: 08/25/17 12:50**

**Matrix: Water**

**Date Received: 08/26/17 08:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493845 | 09/02/17 01:31 | UI | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493515 | 08/30/17 10:35 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 19:30 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493511 | 08/30/17 10:35 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493787 | 08/31/17 16:52 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 386074 | 08/29/17 17:07 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386182 | 08/30/17 14:53 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-10-62-64

**Lab Sample ID: 680-142532-8**

**Date Collected: 08/25/17 14:15**

**Matrix: Water**

**Date Received: 08/26/17 08:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 493846 | 09/02/17 03:01 | UI | TAL SAV |
| | Instrument ID: CICL | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 493249 | 08/28/17 14:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 493827 | 08/31/17 18:23 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 493247 | 08/28/17 14:09 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 493494 | 08/29/17 18:07 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142532-1

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060 | | 1 | | | 386074 | 08/29/17 17:52 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 386230 | 08/30/17 21:19 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 1 of: 1

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation: Kam G. Anderson

Sampler(s) Signature(s): [signature]

Preservatives (see codes): N I I S S I O S

Analyses Requested

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-09-52-54 | 8/24/17 | 1210 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-09-62-64 | 8/24/17 | 1350 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-10-22-24 | 8/24/17 | 1610 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-10-32-34 | 8/25/17 | 915 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-10-42-44 | 8/25/17 | 1050 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-DUP-3 | 8/25/17 | 1100 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-10-52-54 | 8/25/17 | 1250 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-10-62-64 | 8/25/17 | 1415 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |

680-142532 Chain of Custody

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | [signature] | 8/25/17 | 1420 | [signature] | 8-25-17 | 1420 |
| Additional Comments: | | | [signature] | 8-25-17 | 1700 | [signature] | 8/26/17 | 0845 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal # _____

Preserve Where Applicable ☐
On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

0.5(CF+0.3)0.6

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: Lanier, Jerry A | Carrier Tracking No(s): | COC No: 280-410439.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: jerry.lanier@testamericainc.com | State of Origin: Massachusetts | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): DoD ELAP - A2LA | | Job #: 680-142532-1 |
| Address: 5102 LaRoche Avenue, , | Due Date Requested: 9/7/2017 | | | |
| City: Savannah | TAT Requested (days): | | | |
| State, Zip: GA, 31404 | | | | |
| Phone: 912-354-7858(Tel) 912-352-0165(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Devens - SHL EPA SOW Phase 1 | Project #: 68016363 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | [redacted] | 6010C_DOD5/FIELD_FLTRD Dissolved Iron and Manganese | 6020A_DOD5/FIELD_FLTRD Dissolved Arsenic | 6010C_DOD5/3005A Dissolved Iron and Manganese | 6020A_DOD5/3005A Dissolved Arsenic | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | | | | |
| SB-2017-10-52-54 (680-142532-7) | 8/25/17 | 12:50 Eastern | | Water | | | [redacted] | X | X | X | X | 1 | |

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

| Possible Hazard Identification | Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month) |
|---|---|
| Unconfirmed | ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by | Date/Time | Company | Received by | Date/Time | Company |
|---|---|---|---|---|---|
| [signature] | 8/28/17 1430 | TAD | [signature] | 8/29/17 0930 | |
| | | | | 21.1(21.4) | |
| | | | | | |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

680-142532 Chain of Custody

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

of:

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation
Vann G. Anderson

Sampler(s) Signature(s)
[signature]

Preservatives (see codes): N I I S S I O S

Analyses Requested

Laboratory: [illegible] - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-09-52-54 | 8/24/17 | 1210 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-09-62-64 | 8/24/17 | 1350 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-10-22-24 | 8/24/17 | 1610 | GW | 4 | ✓ | ✓ | ✓ | ✓ | DOC- ALKALINITY | |
| SB-2017-10-32-34 | 8/25/17 | 915 | GW | 4 | ✓ | ✓ | ✓ | ✓ | TO DENVER | |
| SB-2017-10-42-44 | 8/25/17 | 1050 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-DUP-3 | 8/25/17 | 1100 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-10-52-54 | 8/25/17 | 1250 | GW | 4 | ✓ | ✓ | ✓ | ✓ | THE REST TO | |
| SB-2017-10-62-64 | 8/25/17 | 1415 | GW | 4 | ✓ | ✓ | ✓ | ✓ | SAVANNAH | |

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | [signature] | 8/25/17 | 1420 | [signature] | 8-25-17 | 1420 |
| Additional Comments: | | | [signature] | 8-25-17 | 1100 | [signature] | 8-26-17 | 0840 |

* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐
Ice 7 +0.1 On ICE ☐

Temperature 42 C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Lanier, Jerry A | Carrier Tracking No(s): | COC No: 280-410439.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: jerry.lanier@testamericainc.com | State of Origin: Massachusetts | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): DoD ELAP - A2LA | | Job #: 680-142532-1 |
| Address: 5102 LaRoche Avenue, , | Due Date Requested: 9/7/2017 | | | |
| City: Savannah | TAT Requested (days): | | | |
| State, Zip: GA, 31404 | | | | |
| Phone: 912-354-7858(Tel) 912-352-0165(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Devens - SHL EPA SOW Phase 1 | Project #: 68016363 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | [redacted] | 6010C_DOD5/FIELD_FLTRD Dissolved Iron and Manganese | 6020A_DOD5/FIELD_FLTRD Dissolved Arsenic | 6010C_DOD5/3005A Dissolved Iron and Manganese | 6020A_DOD5/3005A Dissolved Arsenic | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | | | | |
| SB-2017-10-52-54 (680-142532-7) | 8/25/17 | 12:50 Eastern | | Water | | | [redacted] | X | X | X | X | 1 | |

Ref:
Dep:
Date: 28Aug17
Wgt: 3.70 LBS
Svcs: STANDARD OVERNIGHT
TRCK: 7367 5479 3109
DV:
SHIPPING: 0.00
SPECIAL: 0.00
HANDLING: 0.00
TOTAL: 0.00

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | |
|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| Patricia Tue | 8/28/17 1430 | TAD | | | |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| | | |
|---|---|---|
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |

**TestAmerica Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: Lanier, Jerry A | Carrier Tracking No(s): | COC No: 680-489010.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: jerry.lanier@testamericainc.com | State of Origin: Massachusetts | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): DoD ELAP - A2LA | | Job #: 680-142532-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 9/7/2017 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Devens - SHL EPA SOW Phase 1 | Project #: 68016363 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060_Diss/FIELD_FLTRD DOC | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SB-2017-10-52-54 (680-142532-7) | 8/25/17 | 12:50 Eastern | | Water | | | X | X | 1 | |

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

***Possible Hazard Identification***
*Unconfirmed*

***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)***
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
|---|---|---|---|---|---|
| Relinquished by: | Date/Time: 08-28-17 1554 | Company: Sav | Received by: | Date/Time: 8/29/17 0915 | Company: TPS |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

# Login Sample Receipt Checklist

Client: KOMAN Government Solutions, LLC

Job Number: 680-142532-1

**Login Number: 142532**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: Ragnaldsen, Amy E**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | N/A | |
| Residual Chlorine Checked. | N/A | |

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142532-1

## Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| | AFCEE | | SAVLAB | |
| Alabama | State Program | 4 | 41450 | 06-30-18 |
| Alaska | State Program | 10 | | 06-30-18 |
| Alaska (UST) | State Program | 10 | UST-104 | 11-05-17 * |
| Arizona | State Program | 9 | AZ808 | 12-14-17 |
| Arkansas DEQ | State Program | 6 | 88-0692 | 02-01-18 |
| California | State Program | 9 | 2939 | 06-30-17 * |
| Colorado | State Program | 8 | N/A | 12-31-17 |
| Connecticut | State Program | 1 | PH-0161 | 03-31-19 |
| Florida | NELAP | 4 | E87052 | 06-30-18 |
| GA Dept. of Agriculture | State Program | 4 | N/A | 06-12-18 |
| Georgia | State Program | 4 | 803 | 06-30-18 |
| Guam | State Program | 9 | 15-005r | 04-16-18 |
| Hawaii | State Program | 9 | N/A | 06-30-18 |
| Illinois | NELAP | 5 | 200022 | 11-30-17 |
| Indiana | State Program | 5 | N/A | 06-30-18 |
| Iowa | State Program | 7 | 353 | 06-30-19 |
| Kentucky (DW) | State Program | 4 | 90084 | 12-31-17 |
| Kentucky (UST) | State Program | 4 | 18 | 06-30-18 |
| Kentucky (WW) | State Program | 4 | 90084 | 12-31-17 |
| L-A-B | DoD ELAP | | L2463 | 09-22-19 |
| L-A-B | ISO/IEC 17025 | | L2463.01 | 09-22-19 |
| Louisiana | NELAP | 6 | 30690 | 06-30-18 |
| Louisiana (DW) | NELAP | 6 | LA160019 | 12-31-17 |
| Maine | State Program | 1 | GA00006 | 09-24-18 |
| Maryland | State Program | 3 | 250 | 12-31-17 |
| Massachusetts | State Program | 1 | M-GA006 | 06-30-18 |
| Michigan | State Program | 5 | 9925 | 06-30-17 * |
| Mississippi | State Program | 4 | N/A | 06-30-18 |
| Nebraska | State Program | 7 | TestAmerica-Savannah | 06-30-18 |
| New Jersey | NELAP | 2 | GA769 | 06-30-18 |
| New Mexico | State Program | 6 | N/A | 06-30-18 |
| New York | NELAP | 2 | 10842 | 03-31-18 |
| North Carolina (DW) | State Program | 4 | 13701 | 07-31-18 |
| North Carolina (WW/SW) | State Program | 4 | 269 | 12-31-17 |
| Oklahoma | State Program | 6 | 9984 | 08-31-18 |
| Pennsylvania | NELAP | 3 | 68-00474 | 06-30-18 |
| Puerto Rico | State Program | 2 | GA00006 | 12-31-17 |
| South Carolina | State Program | 4 | 98001 | 06-30-17 * |
| Tennessee | State Program | 4 | TN02961 | 06-30-18 |
| Texas | NELAP | 6 | T104704185-16-9 | 11-30-17 |
| US Fish & Wildlife | Federal | | LE058448-0 | 07-31-18 |
| USDA | Federal | | SAV 3-04 | 06-14-20 * |
| Virginia | NELAP | 3 | 460161 | 06-14-18 |
| Washington | State Program | 10 | C805 | 06-10-18 |
| West Virginia (DW) | State Program | 3 | 9950C | 12-31-17 |
| West Virginia DEP | State Program | 3 | 094 | 06-30-18 |
| Wisconsin | State Program | 5 | 999819810 | 08-31-17 * |
| Wyoming | State Program | 8 | 8TMS-L | 06-30-16 * |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-142532-1

## Laboratory: TestAmerica Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

TestAmerica Job ID: 680-143134-1
Client Project/Site: Devens - SHL EPA SOW Phase 1

For:
KOMAN Government Solutions, LLC
293 Boston Post Road
Suite 100
Marlborough, Massachusetts 01752

Attn: Laurie Ekes

*Authorized for release by:*
*9/27/2017 9:53:43 AM*

Jerry Lanier, Project Manager I
(912)354-7858 e.3410
jerry.lanier@testamericainc.com

LINKS

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www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Job ID: 680-143134-1

**Laboratory: TestAmerica Savannah**

**Narrative**

# CASE NARRATIVE

## Client: KOMAN Government Solutions, LLC

## Project: Devens - SHL EPA SOW Phase 1

## Report Number: 680-143134-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 09/16/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.8º C, 1.8º C and 2.6º C.

**METALS (ICP) - DISSOLVED**
Samples SB-2017-16-42-44 (680-143134-1), SB-2017-16-52-54 (680-143134-2), SB-2017-16-62-64 (680-143134-3), SB-2017-18-82-84 (680-143134-4), SB-2017-18-91-93 (680-143134-5), SB-2017-15-22-24 (680-143134-6), SB-2017-15-32-34 (680-143134-7), SB-2017-15-37-39 (680-143134-8), SB-2017-14-22-24 (680-143134-9), SB-2017-16-32-34 (680-143134-10), SB-2017-14-32-34 (680-143134-11), SB-2017-13-22-24 (680-143134-12), SB-2017-DUP-09 (680-143134-13), SB-2017-13-32-34 (680-143134-14), SB-2017-DUP-10 (680-143134-15) and SB-2017-13-41-43 (680-143134-16) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/18/2017 and 09/20/2017 and analyzed on 09/20/2017 and 09/21/2017.

Iron failed the recovery criteria low for the MS of sample SB-2017-16-52-54MS (680-143134-2) in batch 680-495534.

Iron and Manganese failed the recovery criteria low for the MSD of sample SB-2017-16-52-54MSD (680-143134-2) in batch 680-495534.

Manganese failed the recovery criteria low for the MSD of sample SB-2017-18-82-84MSD (680-143134-4) in batch 680-495534.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples SB-2017-16-42-44 (680-143134-1), SB-2017-16-52-54 (680-143134-2), SB-2017-16-62-64 (680-143134-3), SB-2017-18-82-84 (680-143134-4), SB-2017-18-91-93 (680-143134-5), SB-2017-15-22-24 (680-143134-6), SB-2017-15-32-34 (680-143134-7), SB-2017-15-37-39 (680-143134-8), SB-2017-14-22-24 (680-143134-9), SB-2017-16-32-34 (680-143134-10), SB-2017-14-32-34 (680-143134-11), SB-2017-13-22-24 (680-143134-12), SB-2017-DUP-09 (680-143134-13), SB-2017-13-32-34 (680-143134-14), SB-2017-DUP-10 (680-143134-15) and SB-2017-13-41-43 (680-143134-16) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 09/18/2017 and 09/20/2017 and analyzed on 09/20/2017.

Arsenic failed the recovery criteria low for the MS/MSD of sample SB-2017-16-52-54 (680-143134-2) in batch 680-495430.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Job ID: 680-143134-1 (Continued)

### Laboratory: TestAmerica Savannah (Continued)

**ALKALINITY**

Samples SB-2017-16-42-44 (680-143134-1), SB-2017-16-52-54 (680-143134-2), SB-2017-16-62-64 (680-143134-3), SB-2017-18-82-84 (680-143134-4), SB-2017-18-91-93 (680-143134-5), SB-2017-15-22-24 (680-143134-6), SB-2017-15-32-34 (680-143134-7), SB-2017-15-37-39 (680-143134-8), SB-2017-14-22-24 (680-143134-9), SB-2017-16-32-34 (680-143134-10), SB-2017-14-32-34 (680-143134-11), SB-2017-13-22-24 (680-143134-12), SB-2017-DUP-09 (680-143134-13), SB-2017-13-32-34 (680-143134-14), SB-2017-DUP-10 (680-143134-15) and SB-2017-13-41-43 (680-143134-16) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 09/21/2017 and 09/22/2017.

Alkalinity was detected in method blank MB 280-388750/31 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**PH**

Samples SB-2017-16-42-44 (680-143134-1), SB-2017-16-52-54 (680-143134-2), SB-2017-16-62-64 (680-143134-3) and SB-2017-16-32-34 (680-143134-10) were analyzed for pH in accordance with EPA SW-846 Method 9040C. The samples were analyzed on 09/19/2017.

This analysis is considered a field test and is to be performed within 15 minutes of collection. This sample(s) was performed in the laboratory outside the 15 minute timeframe.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**

Samples SB-2017-16-42-44 (680-143134-1), SB-2017-16-52-54 (680-143134-2), SB-2017-16-62-64 (680-143134-3), SB-2017-18-82-84 (680-143134-4), SB-2017-18-91-93 (680-143134-5), SB-2017-15-22-24 (680-143134-6), SB-2017-15-32-34 (680-143134-7), SB-2017-15-37-39 (680-143134-8), SB-2017-14-22-24 (680-143134-9), SB-2017-16-32-34 (680-143134-10), SB-2017-14-32-34 (680-143134-11), SB-2017-13-22-24 (680-143134-12), SB-2017-DUP-09 (680-143134-13), SB-2017-13-32-34 (680-143134-14), SB-2017-DUP-10 (680-143134-15) and SB-2017-13-41-43 (680-143134-16) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 09/19/2017 and 09/20/2017.

Samples SB-2017-16-62-64 (680-143134-3)[4X], SB-2017-15-22-24 (680-143134-6)[2X], SB-2017-16-32-34 (680-143134-10)[2X], SB-2017-13-22-24 (680-143134-12)[4X], SB-2017-DUP-09 (680-143134-13)[4X], SB-2017-13-32-34 (680-143134-14)[10X] and SB-2017-DUP-10 (680-143134-15)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**DISSOLVED ORGANIC CARBON**

Samples SB-2017-16-42-44 (680-143134-1), SB-2017-16-52-54 (680-143134-2), SB-2017-16-62-64 (680-143134-3), SB-2017-18-82-84 (680-143134-4), SB-2017-18-91-93 (680-143134-5), SB-2017-15-22-24 (680-143134-6), SB-2017-15-32-34 (680-143134-7), SB-2017-15-37-39 (680-143134-8), SB-2017-14-22-24 (680-143134-9), SB-2017-16-32-34 (680-143134-10), SB-2017-14-32-34 (680-143134-11), SB-2017-13-22-24 (680-143134-12), SB-2017-DUP-09 (680-143134-13), SB-2017-13-32-34 (680-143134-14), SB-2017-DUP-10 (680-143134-15) and SB-2017-13-41-43 (680-143134-16) were analyzed for dissolved organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 09/20/2017, 09/22/2017 and 09/23/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 680-143134-1 | SB-2017-16-42-44 | Water | 09/14/17 09:27 | 09/16/17 10:00 |
| 680-143134-2 | SB-2017-16-52-54 | Water | 09/14/17 11:05 | 09/16/17 10:00 |
| 680-143134-3 | SB-2017-16-62-64 | Water | 09/14/17 13:00 | 09/16/17 10:00 |
| 680-143134-4 | SB-2017-18-82-84 | Water | 09/13/17 14:55 | 09/16/17 10:00 |
| 680-143134-5 | SB-2017-18-91-93 | Water | 09/13/17 17:00 | 09/16/17 10:00 |
| 680-143134-6 | SB-2017-15-22-24 | Water | 09/14/17 10:20 | 09/16/17 10:00 |
| 680-143134-7 | SB-2017-15-32-34 | Water | 09/14/17 11:35 | 09/16/17 10:00 |
| 680-143134-8 | SB-2017-15-37-39 | Water | 09/14/17 12:55 | 09/16/17 10:00 |
| 680-143134-9 | SB-2017-14-22-24 | Water | 09/14/17 15:00 | 09/16/17 10:00 |
| 680-143134-10 | SB-2017-16-32-34 | Water | 09/13/17 15:40 | 09/16/17 10:00 |
| 680-143134-11 | SB-2017-14-32-34 | Water | 09/14/17 16:20 | 09/16/17 10:00 |
| 680-143134-12 | SB-2017-13-22-24 | Water | 09/15/17 09:50 | 09/16/17 10:00 |
| 680-143134-13 | SB-2017-DUP-09 | Water | 09/15/17 09:55 | 09/16/17 10:00 |
| 680-143134-14 | SB-2017-13-32-34 | Water | 09/15/17 11:30 | 09/16/17 10:00 |
| 680-143134-15 | SB-2017-DUP-10 | Water | 09/15/17 11:30 | 09/16/17 10:00 |
| 680-143134-16 | SB-2017-13-41-43 | Water | 09/15/17 13:15 | 09/16/17 10:00 |

# Method Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9040C | pH | SW846 | TAL SAV |
| 9060 | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| M | Manual integrated compound. |
| D | The reported value is from a dilution. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-16-42-44 — Lab Sample ID: 680-143134-1

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.7 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 3.4 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 32000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 980 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 420 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| pH | 7.2 | | | | | SU | 1 | | 9040C | Total/NA |
| Alkalinity | 91 | | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.7 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-16-52-54 — Lab Sample ID: 680-143134-2

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 15 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 2.8 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 41000 | J | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 1400 | J | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 1300 | J | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| pH | 7.3 | | | | | SU | 1 | | 9040C | Total/NA |
| Alkalinity | 190 | | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.1 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-16-62-64 — Lab Sample ID: 680-143134-3

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 140 | D | 2.0 | 2.0 | 0.80 | mg/L | 4 | | 9056A | Total/NA |
| Sulfate | 4.0 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 5300 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 7300 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 1.7 | J | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| pH | 7.7 | | | | | SU | 1 | | 9040C | Total/NA |
| Alkalinity | 380 | | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 3.1 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-18-82-84 — Lab Sample ID: 680-143134-4

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 22 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 2.4 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 41000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 7600 | J | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 94 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 290 | | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 3.0 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-18-91-93 — Lab Sample ID: 680-143134-5

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-18-91-93 (Continued) — Lab Sample ID: 680-143134-5

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 40 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 7.5 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 15000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 4100 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 1.7 | J | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 420 | | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 3.5 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-15-22-24 — Lab Sample ID: 680-143134-6

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 85 | D | 1.0 | 1.0 | 0.40 | mg/L | 2 | | 9056A | Total/NA |
| Sulfate | 8.6 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 29000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 4800 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 550 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 51 | | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.1 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-15-32-34 — Lab Sample ID: 680-143134-7

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 12 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 3.5 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 31000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 850 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 1300 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 84 | | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.8 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-15-37-39 — Lab Sample ID: 680-143134-8

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 2.5 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 53000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 1500 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 2100 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 210 | | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 3.3 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-14-22-24 — Lab Sample ID: 680-143134-9

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 39 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 3.1 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 28000 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |

This Detection Summary does not include radiochemical test results.

## Client Sample ID: SB-2017-14-22-24 (Continued) — Lab Sample ID: 680-143134-9

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Manganese | 1500 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 2000 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 44 | | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 2.0 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-16-32-34 — Lab Sample ID: 680-143134-10

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 76 | D | 1.0 | 1.0 | 0.40 | mg/L | 2 | | 9056A | Total/NA |
| Sulfate | 2.5 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 3500 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 570 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 260 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| pH | 7.9 | | | | | SU | 1 | | 9040C | Total/NA |
| Alkalinity | 86 | | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 3.4 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-14-32-34 — Lab Sample ID: 680-143134-11

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.7 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 3.6 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 5500 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 1700 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 490 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 43 | | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 1.6 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-13-22-24 — Lab Sample ID: 680-143134-12

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 130 | D | 2.0 | 2.0 | 0.80 | mg/L | 4 | | 9056A | Total/NA |
| Sulfate | 9.9 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 120 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 86 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 1.5 | J | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 24 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 0.58 | J | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-DUP-09 — Lab Sample ID: 680-143134-13

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 130 | D | 2.0 | 2.0 | 0.80 | mg/L | 4 | | 9056A | Total/NA |
| Sulfate | 9.8 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 120 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 90 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Alkalinity | 23 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-DUP-09 (Continued) — Lab Sample ID: 680-143134-13

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.1 | | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-13-32-34 — Lab Sample ID: 680-143134-14

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 340 | D | 5.0 | 5.0 | 2.0 | mg/L | 10 | | 9056A | Total/NA |
| Sulfate | 5.3 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 870 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 160 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Alkalinity | 12 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 0.50 | J | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-DUP-10 — Lab Sample ID: 680-143134-15

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 340 | D | 5.0 | 5.0 | 2.0 | mg/L | 10 | | 9056A | Total/NA |
| Sulfate | 5.2 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 880 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 160 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Alkalinity | 13 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 0.49 | J | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

## Client Sample ID: SB-2017-13-41-43 — Lab Sample ID: 680-143134-16

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.5 | | 0.50 | 0.50 | 0.20 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 2.7 | M | 1.0 | 1.0 | 0.40 | mg/L | 1 | | 9056A | Total/NA |
| Iron | 3700 | | 50 | 50 | 17 | ug/L | 1 | | 6010C | Dissolved |
| Manganese | 1100 | | 10 | 3.0 | 1.0 | ug/L | 1 | | 6010C | Dissolved |
| Arsenic | 3.7 | | 3.0 | 3.0 | 1.5 | ug/L | 1 | | 6020A | Dissolved |
| Alkalinity | 24 | B | 5.0 | 3.2 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Dissolved Organic Carbon - Duplicate | 0.64 | J | 1.0 | 0.50 | 0.16 | mg/L | 1 | | 9060 | Dissolved |

This Detection Summary does not include radiochemical test results.

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-16-42-44

**Lab Sample ID: 680-143134-1**

**Date Collected: 09/14/17 09:27**
**Date Received: 09/16/17 10:00**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.7 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 20:34 | 1 |
| Sulfate | 3.4 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 20:34 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 32000 | | 50 | 50 | 17 | ug/L | | 09/20/17 12:39 | 1 |
| Manganese | 980 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 12:39 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 420 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 02:43 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 7.2 | | | | | SU | | 09/19/17 14:26 | 1 |
| Alkalinity | 91 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 15:23 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.7 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 05:46 | 1 |

## Client Sample ID: SB-2017-16-52-54

**Lab Sample ID: 680-143134-2**

**Date Collected: 09/14/17 11:05**
**Date Received: 09/16/17 10:00**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 15 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 21:26 | 1 |
| Sulfate | 2.8 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 21:26 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 41000 | J | 50 | 50 | 17 | ug/L | | 09/21/17 01:49 | 1 |
| Manganese | 1400 | J | 10 | 3.0 | 1.0 | ug/L | | 09/21/17 01:49 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1300 | J | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 16:53 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 7.3 | | | | | SU | | 09/19/17 14:30 | 1 |
| Alkalinity | 190 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 15:28 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.1 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 06:37 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-16-62-64

**Lab Sample ID: 680-143134-3**

**Date Collected: 09/14/17 13:00**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 140 | D | 2.0 | 2.0 | 0.80 | mg/L | | 09/20/17 12:52 | 4 |
| Sulfate | 4.0 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 22:01 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 5300 | | 50 | 50 | 17 | ug/L | | 09/20/17 13:40 | 1 |
| Manganese | 7300 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 13:40 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.7 | J | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 03:39 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 7.7 | | | | | SU | | 09/19/17 14:34 | 1 |
| Alkalinity | 380 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 15:58 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.1 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 06:54 | 1 |

## Client Sample ID: SB-2017-18-82-84

**Lab Sample ID: 680-143134-4**

**Date Collected: 09/13/17 14:55**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 22 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 22:18 | 1 |
| Sulfate | 2.4 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 22:18 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 41000 | | 50 | 50 | 17 | ug/L | | 09/20/17 12:16 | 1 |
| Manganese | 7600 | J | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 12:16 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 94 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 02:21 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 290 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 15:37 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.0 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 07:11 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-18-91-93

**Lab Sample ID: 680-143134-5**

**Date Collected: 09/13/17 17:00**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 40 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 22:36 | 1 |
| Sulfate | 7.5 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 22:36 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 15000 | | 50 | 50 | 17 | ug/L | | 09/20/17 13:07 | 1 |
| Manganese | 4100 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 13:07 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.7 | J | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 03:09 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 420 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 15:52 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.5 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 07:28 | 1 |

## Client Sample ID: SB-2017-15-22-24

**Lab Sample ID: 680-143134-6**

**Date Collected: 09/14/17 10:20**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 85 | D | 1.0 | 1.0 | 0.40 | mg/L | | 09/20/17 12:00 | 2 |
| Sulfate | 8.6 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 23:28 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 29000 | | 50 | 50 | 17 | ug/L | | 09/20/17 13:26 | 1 |
| Manganese | 4800 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 13:26 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 550 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 03:26 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 51 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 16:07 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.1 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 07:44 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-15-32-34

**Lab Sample ID: 680-143134-7**

**Date Collected: 09/14/17 11:35**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 12 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 23:45 | 1 |
| Sulfate | 3.5 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 23:45 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 31000 | | 50 | 50 | 17 | ug/L | | 09/20/17 13:12 | 1 |
| Manganese | 850 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 13:12 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1300 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 03:13 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 84 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 16:02 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.8 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 08:35 | 1 |

## Client Sample ID: SB-2017-15-37-39

**Lab Sample ID: 680-143134-8**

**Date Collected: 09/14/17 12:55**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/20/17 00:03 | 1 |
| Sulfate | 2.5 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/20/17 00:03 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 53000 | | 50 | 50 | 17 | ug/L | | 09/20/17 13:59 | 1 |
| Manganese | 1500 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 13:59 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2100 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 03:57 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 210 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 15:18 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.3 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 08:52 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-14-22-24

**Lab Sample ID: 680-143134-9**

**Date Collected: 09/14/17 15:00**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 39 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/20/17 00:55 | 1 |
| Sulfate | 3.1 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/20/17 00:55 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 28000 | | 50 | 50 | 17 | ug/L | | 09/20/17 13:21 | 1 |
| Manganese | 1500 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 13:21 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2000 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 03:22 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 44 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 15:32 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 2.0 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/22/17 23:24 | 1 |

## Client Sample ID: SB-2017-16-32-34

**Lab Sample ID: 680-143134-10**

**Date Collected: 09/13/17 15:40**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 76 | D | 1.0 | 1.0 | 0.40 | mg/L | | 09/20/17 11:43 | 2 |
| Sulfate | 2.5 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/20/17 01:12 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 3500 | | 50 | 50 | 17 | ug/L | | 09/20/17 12:44 | 1 |
| Manganese | 570 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 12:44 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 260 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 02:47 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 7.9 | | | | | SU | | 09/19/17 14:38 | 1 |
| Alkalinity | 86 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 15:09 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 3.4 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/22/17 23:41 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-14-32-34

**Lab Sample ID: 680-143134-11**

**Date Collected: 09/14/17 16:20**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.7 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/20/17 01:30 | 1 |
| Sulfate | 3.6 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/20/17 01:30 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 5500 | | 50 | 50 | 17 | ug/L | | 09/20/17 12:49 | 1 |
| Manganese | 1700 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 12:49 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 490 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 02:52 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 43 | | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 15:14 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.6 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/22/17 23:58 | 1 |

## Client Sample ID: SB-2017-13-22-24

**Lab Sample ID: 680-143134-12**

**Date Collected: 09/15/17 09:50**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 130 | D | 2.0 | 2.0 | 0.80 | mg/L | | 09/20/17 11:08 | 4 |
| Sulfate | 9.9 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/20/17 01:47 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 120 | | 50 | 50 | 17 | ug/L | | 09/20/17 13:31 | 1 |
| Manganese | 86 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 13:31 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | J | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 03:31 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 24 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/22/17 21:10 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.58 | J | 1.0 | 0.50 | 0.16 | mg/L | | 09/23/17 00:57 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-DUP-09

**Lab Sample ID: 680-143134-13**

**Date Collected: 09/15/17 09:55**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 130 | D | 2.0 | 2.0 | 0.80 | mg/L | | 09/20/17 10:50 | 4 |
| Sulfate | 9.8 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/20/17 02:57 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 120 | | 50 | 50 | 17 | ug/L | | 09/20/17 13:45 | 1 |
| Manganese | 90 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 13:45 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 03:44 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 23 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/22/17 21:42 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.1 | | 1.0 | 0.50 | 0.16 | mg/L | | 09/23/17 01:13 | 1 |

## Client Sample ID: SB-2017-13-32-34

**Lab Sample ID: 680-143134-14**

**Date Collected: 09/15/17 11:30**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 340 | D | 5.0 | 5.0 | 2.0 | mg/L | | 09/20/17 10:33 | 10 |
| Sulfate | 5.3 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/20/17 03:14 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 870 | | 50 | 50 | 17 | ug/L | | 09/20/17 13:03 | 1 |
| Manganese | 160 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 13:03 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 03:05 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 12 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/22/17 21:37 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | J | 1.0 | 0.50 | 0.16 | mg/L | | 09/23/17 02:04 | 1 |

# Client Sample Results

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-DUP-10

**Lab Sample ID: 680-143134-15**

**Date Collected: 09/15/17 11:30**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 340 | D | 5.0 | 5.0 | 2.0 | mg/L | | 09/20/17 10:16 | 10 |
| Sulfate | 5.2 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/20/17 03:31 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 880 | | 50 | 50 | 17 | ug/L | | 09/20/17 13:35 | 1 |
| Manganese | 160 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 13:35 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 03:35 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 13 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/22/17 21:27 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.49 | J | 1.0 | 0.50 | 0.16 | mg/L | | 09/23/17 02:18 | 1 |

## Client Sample ID: SB-2017-13-41-43

**Lab Sample ID: 680-143134-16**

**Date Collected: 09/15/17 13:15**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.5 | | 0.50 | 0.50 | 0.20 | mg/L | | 09/20/17 03:49 | 1 |
| Sulfate | 2.7 | M | 1.0 | 1.0 | 0.40 | mg/L | | 09/20/17 03:49 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 3700 | | 50 | 50 | 17 | ug/L | | 09/20/17 13:17 | 1 |
| Manganese | 1100 | | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 13:17 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.7 | | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 03:17 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 24 | B | 5.0 | 3.2 | 1.1 | mg/L | | 09/22/17 21:32 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.64 | J | 1.0 | 0.50 | 0.16 | mg/L | | 09/23/17 02:35 | 1 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-495163/35** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495163**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 09/19/17 19:07 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 09/19/17 19:07 | 1 |

**Lab Sample ID: LCS 680-495163/36** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495163**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.81 | | mg/L | | 98 | 87 - 111 |
| Sulfate | 10.0 | 9.62 | | mg/L | | 96 | 87 - 112 |

**Lab Sample ID: LCSD 680-495163/37** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495163**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.81 | | mg/L | | 98 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 9.56 | | mg/L | | 96 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-143134-1 MS** — **Client Sample ID: SB-2017-16-42-44**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495163**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.7 | | 10.0 | 15.3 | | mg/L | | 105 | 87 - 111 |
| Sulfate | 3.4 | M | 10.0 | 13.5 | M | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: 680-143134-1 MSD** — **Client Sample ID: SB-2017-16-42-44**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495163**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.7 | | 10.0 | 15.2 | | mg/L | | 104 | 87 - 111 | 1 | 15 |
| Sulfate | 3.4 | M | 10.0 | 13.4 | M | mg/L | | 100 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-143134-8 MS** — **Client Sample ID: SB-2017-15-37-39**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495163**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 10.0 | 27.0 | | mg/L | | 102 | 87 - 111 |
| Sulfate | 2.5 | M | 10.0 | 12.3 | M | mg/L | | 98 | 87 - 112 |

**Lab Sample ID: 680-143134-8 MSD** — **Client Sample ID: SB-2017-15-37-39**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495163**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 17 | | 10.0 | 27.1 | | mg/L | | 103 | 87 - 111 | 0 | 15 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: 680-143134-8 MSD** — **Client Sample ID: SB-2017-15-37-39**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495163**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 2.5 | M | 10.0 | 12.4 | M | mg/L | | 99 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-143134-2 DU** — **Client Sample ID: SB-2017-16-52-54**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495163**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 15 | | | 14.7 | | mg/L | | | | 0.1 | 15 |
| Sulfate | 2.8 | M | | 2.75 | M | mg/L | | | | 1 | 15 |

**Lab Sample ID: 680-143134-12 DU** — **Client Sample ID: SB-2017-13-22-24**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495163**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 9.9 | M | | 9.88 | M | mg/L | | | | 0.2 | 15 |

**Lab Sample ID: MB 680-495261/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495261**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.50 | U | 0.50 | 0.50 | 0.20 | mg/L | | 09/20/17 08:14 | 1 |
| Sulfate | 1.0 | U | 1.0 | 1.0 | 0.40 | mg/L | | 09/20/17 08:14 | 1 |

**Lab Sample ID: LCS 680-495261/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495261**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 10.0 | 9.80 | | mg/L | | 98 | 87 - 111 | | |
| Sulfate | | | 10.0 | 9.78 | | mg/L | | 98 | 87 - 112 | | |

**Lab Sample ID: LCSD 680-495261/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495261**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 10.0 | 9.79 | | mg/L | | 98 | 87 - 111 | 0 | 15 |
| Sulfate | | | 10.0 | 9.81 | | mg/L | | 98 | 87 - 112 | 0 | 15 |

**Lab Sample ID: 680-143134-12 DU** — **Client Sample ID: SB-2017-13-22-24**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495261**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 130 | D | | 129 | D | mg/L | | | | 0.1 | 15 |
| Sulfate | 7.8 | D M | | 7.85 | D M | mg/L | | | | 0 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-495062/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495534** — **Prep Batch: 495062**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 09/20/17 12:06 | 1 |
| Manganese | 3.0 | U | 10 | 3.0 | 1.0 | ug/L | | 09/20/17 12:06 | 1 |

**Lab Sample ID: LCS 680-495062/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495534** — **Prep Batch: 495062**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 5230 | | ug/L | | 105 | 87 - 115 |
| Manganese | 500 | 538 | | ug/L | | 108 | 90 - 114 |

**Lab Sample ID: MB 680-495335/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495534** — **Prep Batch: 495335**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50 | U | 50 | 50 | 17 | ug/L | | 09/21/17 01:39 | 1 |
| Manganese | 3.0 | U | 10 | 3.0 | 1.0 | ug/L | | 09/21/17 01:39 | 1 |

**Lab Sample ID: LCS 680-495335/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495534** — **Prep Batch: 495335**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 5210 | | ug/L | | 104 | 87 - 115 |
| Manganese | 500 | 528 | | ug/L | | 106 | 90 - 114 |

**Lab Sample ID: 680-143134-4 MS** — **Client Sample ID: SB-2017-18-82-84**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495534** — **Prep Batch: 495062**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 41000 | | 5000 | 45900 | 4 | ug/L | | 107 | 87 - 115 |
| Manganese | 7600 | J | 500 | 8120 | 4 | ug/L | | 105 | 90 - 114 |

**Lab Sample ID: 680-143134-4 MSD** — **Client Sample ID: SB-2017-18-82-84**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495534** — **Prep Batch: 495062**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 41000 | | 5000 | 45400 | 4 | ug/L | | 97 | 87 - 115 | 1 | 20 |
| Manganese | 7600 | J | 500 | 8030 | 4 | ug/L | | 87 | 90 - 114 | 1 | 20 |

**Lab Sample ID: 680-143134-2 MS** — **Client Sample ID: SB-2017-16-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495534** — **Prep Batch: 495335**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 41000 | J | 5000 | 45400 | 4 | ug/L | | 85 | 87 - 115 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 680-143134-2 MS** — **Client Sample ID: SB-2017-16-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495534** — **Prep Batch: 495335**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Manganese | 1400 | J | 500 | 1920 | | ug/L | | 98 | 90 - 114 |

**Lab Sample ID: 680-143134-2 MSD** — **Client Sample ID: SB-2017-16-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495534** — **Prep Batch: 495335**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 41000 | J | 5000 | 42700 | 4 | ug/L | | 31 | 87 - 115 | 6 | 20 |
| Manganese | 1400 | J | 500 | 1820 | J | ug/L | | 78 | 90 - 114 | 5 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-495061/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495330** — **Prep Batch: 495061**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 02:13 | 1 |

**Lab Sample ID: LCS 680-495061/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495330** — **Prep Batch: 495061**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 106 | | ug/L | | 106 | 84 - 116 |

**Lab Sample ID: MB 680-495334/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495430** — **Prep Batch: 495334**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | U | 3.0 | 3.0 | 1.5 | ug/L | | 09/20/17 16:45 | 1 |

**Lab Sample ID: LCS 680-495334/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 495430** — **Prep Batch: 495334**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 114 | | ug/L | | 114 | 84 - 116 |

**Lab Sample ID: 680-143134-4 MS** — **Client Sample ID: SB-2017-18-82-84**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495330** — **Prep Batch: 495061**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 94 | | 100 | 200 | | ug/L | | 106 | 84 - 116 |

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: 680-143134-4 MSD** — **Client Sample ID: SB-2017-18-82-84**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495330** — **Prep Batch: 495061**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 94 | | 100 | 202 | | ug/L | | 109 | 84 - 116 | 1 | 20 |

**Lab Sample ID: 680-143134-2 MS** — **Client Sample ID: SB-2017-16-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495430** — **Prep Batch: 495334**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1300 | J | 100 | 1240 | 4 | ug/L | | -38 | 84 - 116 | | |

**Lab Sample ID: 680-143134-2 MSD** — **Client Sample ID: SB-2017-16-52-54**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 495430** — **Prep Batch: 495334**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1300 | J | 100 | 1150 | 4 | ug/L | | -127 | 84 - 116 | 7 | 20 |

## Method: 9040C - pH

**Lab Sample ID: LCS 680-495236/7** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495236**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| pH | | | 7.00 | 7.1 | | SU | | 101 | 63 - 158 | | |

**Lab Sample ID: 680-143134-10 DU** — **Client Sample ID: SB-2017-16-32-34**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 495236**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| pH | 7.9 | | | 7.9 | | SU | | | | 0.1 | 40 |

## Method: 9060 - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-388294/35** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388294**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 09/20/17 00:15 | 1 |

**Lab Sample ID: LCS 280-388294/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388294**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | | | 25.0 | 24.1 | | mg/L | | 96 | 88 - 112 | | |

## Method: 9060 - Organic Carbon, Dissolved (DOC) (Continued)

**Lab Sample ID: 680-143134-1 MS** — **Client Sample ID: SB-2017-16-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388294**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.7 | | 25.0 | 25.7 | | mg/L | | 96 | 88 - 112 |

**Lab Sample ID: 680-143134-1 MSD** — **Client Sample ID: SB-2017-16-42-44**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388294**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 1.7 | | 25.0 | 25.9 | | mg/L | | 97 | 88 - 112 | 1 | 15 |

**Lab Sample ID: MB 280-388729/35** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388729**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 09/23/17 00:27 | 1 |

**Lab Sample ID: MB 280-388729/4** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388729**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 0.50 | U | 1.0 | 0.50 | 0.16 | mg/L | | 09/22/17 15:46 | 1 |

**Lab Sample ID: LCS 280-388729/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388729**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 25.0 | 24.6 | | mg/L | | 99 | 88 - 112 |

**Lab Sample ID: LCS 280-388729/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 388729**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon - Duplicate | 25.0 | 24.5 | | mg/L | | 98 | 88 - 112 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-388591/31** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 388591**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.2 | U | 5.0 | 3.2 | 1.1 | mg/L | | 09/21/17 14:51 | 1 |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: LCS 280-388591/30** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 388591**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 198 | | mg/L | | 99 | 90 - 110 |

**Lab Sample ID: MB 280-388750/31** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 388750**

| Analyte | MB Result | MB Qualifier | LOQ | LOD | DL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 2.72 | J | 5.0 | 3.2 | 1.1 | mg/L | | 09/22/17 20:09 | 1 |

**Lab Sample ID: LCS 280-388750/30** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 388750**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 186 | | mg/L | | 93 | 90 - 110 |

# QC Association Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## HPLC/IC

### Analysis Batch: 495163

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-1 | SB-2017-16-42-44 | Total/NA | Water | 9056A | |
| 680-143134-2 | SB-2017-16-52-54 | Total/NA | Water | 9056A | |
| 680-143134-3 | SB-2017-16-62-64 | Total/NA | Water | 9056A | |
| 680-143134-4 | SB-2017-18-82-84 | Total/NA | Water | 9056A | |
| 680-143134-5 | SB-2017-18-91-93 | Total/NA | Water | 9056A | |
| 680-143134-6 | SB-2017-15-22-24 | Total/NA | Water | 9056A | |
| 680-143134-7 | SB-2017-15-32-34 | Total/NA | Water | 9056A | |
| 680-143134-8 | SB-2017-15-37-39 | Total/NA | Water | 9056A | |
| 680-143134-9 | SB-2017-14-22-24 | Total/NA | Water | 9056A | |
| 680-143134-10 | SB-2017-16-32-34 | Total/NA | Water | 9056A | |
| 680-143134-11 | SB-2017-14-32-34 | Total/NA | Water | 9056A | |
| 680-143134-12 | SB-2017-13-22-24 | Total/NA | Water | 9056A | |
| 680-143134-13 | SB-2017-DUP-09 | Total/NA | Water | 9056A | |
| 680-143134-14 | SB-2017-13-32-34 | Total/NA | Water | 9056A | |
| 680-143134-15 | SB-2017-DUP-10 | Total/NA | Water | 9056A | |
| 680-143134-16 | SB-2017-13-41-43 | Total/NA | Water | 9056A | |
| MB 680-495163/35 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-495163/36 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-495163/37 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-143134-1 MS | SB-2017-16-42-44 | Total/NA | Water | 9056A | |
| 680-143134-1 MSD | SB-2017-16-42-44 | Total/NA | Water | 9056A | |
| 680-143134-8 MS | SB-2017-15-37-39 | Total/NA | Water | 9056A | |
| 680-143134-8 MSD | SB-2017-15-37-39 | Total/NA | Water | 9056A | |
| 680-143134-2 DU | SB-2017-16-52-54 | Total/NA | Water | 9056A | |
| 680-143134-12 DU | SB-2017-13-22-24 | Total/NA | Water | 9056A | |

### Analysis Batch: 495261

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-3 | SB-2017-16-62-64 | Total/NA | Water | 9056A | |
| 680-143134-6 | SB-2017-15-22-24 | Total/NA | Water | 9056A | |
| 680-143134-10 | SB-2017-16-32-34 | Total/NA | Water | 9056A | |
| 680-143134-12 | SB-2017-13-22-24 | Total/NA | Water | 9056A | |
| 680-143134-13 | SB-2017-DUP-09 | Total/NA | Water | 9056A | |
| 680-143134-14 | SB-2017-13-32-34 | Total/NA | Water | 9056A | |
| 680-143134-15 | SB-2017-DUP-10 | Total/NA | Water | 9056A | |
| MB 680-495261/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-495261/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-495261/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-143134-12 DU | SB-2017-13-22-24 | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 495061

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-1 | SB-2017-16-42-44 | Dissolved | Water | 3005A | |
| 680-143134-3 | SB-2017-16-62-64 | Dissolved | Water | 3005A | |
| 680-143134-4 | SB-2017-18-82-84 | Dissolved | Water | 3005A | |
| 680-143134-5 | SB-2017-18-91-93 | Dissolved | Water | 3005A | |
| 680-143134-6 | SB-2017-15-22-24 | Dissolved | Water | 3005A | |
| 680-143134-7 | SB-2017-15-32-34 | Dissolved | Water | 3005A | |

## Metals (Continued)

### Prep Batch: 495061 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-8 | SB-2017-15-37-39 | Dissolved | Water | 3005A | |
| 680-143134-9 | SB-2017-14-22-24 | Dissolved | Water | 3005A | |
| 680-143134-10 | SB-2017-16-32-34 | Dissolved | Water | 3005A | |
| 680-143134-11 | SB-2017-14-32-34 | Dissolved | Water | 3005A | |
| 680-143134-12 | SB-2017-13-22-24 | Dissolved | Water | 3005A | |
| 680-143134-13 | SB-2017-DUP-09 | Dissolved | Water | 3005A | |
| 680-143134-14 | SB-2017-13-32-34 | Dissolved | Water | 3005A | |
| 680-143134-15 | SB-2017-DUP-10 | Dissolved | Water | 3005A | |
| 680-143134-16 | SB-2017-13-41-43 | Dissolved | Water | 3005A | |
| MB 680-495061/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-495061/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-143134-4 MS | SB-2017-18-82-84 | Dissolved | Water | 3005A | |
| 680-143134-4 MSD | SB-2017-18-82-84 | Dissolved | Water | 3005A | |

### Prep Batch: 495062

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-1 | SB-2017-16-42-44 | Dissolved | Water | 3005A | |
| 680-143134-3 | SB-2017-16-62-64 | Dissolved | Water | 3005A | |
| 680-143134-4 | SB-2017-18-82-84 | Dissolved | Water | 3005A | |
| 680-143134-5 | SB-2017-18-91-93 | Dissolved | Water | 3005A | |
| 680-143134-6 | SB-2017-15-22-24 | Dissolved | Water | 3005A | |
| 680-143134-7 | SB-2017-15-32-34 | Dissolved | Water | 3005A | |
| 680-143134-8 | SB-2017-15-37-39 | Dissolved | Water | 3005A | |
| 680-143134-9 | SB-2017-14-22-24 | Dissolved | Water | 3005A | |
| 680-143134-10 | SB-2017-16-32-34 | Dissolved | Water | 3005A | |
| 680-143134-11 | SB-2017-14-32-34 | Dissolved | Water | 3005A | |
| 680-143134-12 | SB-2017-13-22-24 | Dissolved | Water | 3005A | |
| 680-143134-13 | SB-2017-DUP-09 | Dissolved | Water | 3005A | |
| 680-143134-14 | SB-2017-13-32-34 | Dissolved | Water | 3005A | |
| 680-143134-15 | SB-2017-DUP-10 | Dissolved | Water | 3005A | |
| 680-143134-16 | SB-2017-13-41-43 | Dissolved | Water | 3005A | |
| MB 680-495062/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-495062/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-143134-4 MS | SB-2017-18-82-84 | Dissolved | Water | 3005A | |
| 680-143134-4 MSD | SB-2017-18-82-84 | Dissolved | Water | 3005A | |

### Analysis Batch: 495330

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-1 | SB-2017-16-42-44 | Dissolved | Water | 6020A | 495061 |
| 680-143134-3 | SB-2017-16-62-64 | Dissolved | Water | 6020A | 495061 |
| 680-143134-4 | SB-2017-18-82-84 | Dissolved | Water | 6020A | 495061 |
| 680-143134-5 | SB-2017-18-91-93 | Dissolved | Water | 6020A | 495061 |
| 680-143134-6 | SB-2017-15-22-24 | Dissolved | Water | 6020A | 495061 |
| 680-143134-7 | SB-2017-15-32-34 | Dissolved | Water | 6020A | 495061 |
| 680-143134-8 | SB-2017-15-37-39 | Dissolved | Water | 6020A | 495061 |
| 680-143134-9 | SB-2017-14-22-24 | Dissolved | Water | 6020A | 495061 |
| 680-143134-10 | SB-2017-16-32-34 | Dissolved | Water | 6020A | 495061 |
| 680-143134-11 | SB-2017-14-32-34 | Dissolved | Water | 6020A | 495061 |
| 680-143134-12 | SB-2017-13-22-24 | Dissolved | Water | 6020A | 495061 |
| 680-143134-13 | SB-2017-DUP-09 | Dissolved | Water | 6020A | 495061 |
| 680-143134-14 | SB-2017-13-32-34 | Dissolved | Water | 6020A | 495061 |

## Metals (Continued)

### Analysis Batch: 495330 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-15 | SB-2017-DUP-10 | Dissolved | Water | 6020A | 495061 |
| 680-143134-16 | SB-2017-13-41-43 | Dissolved | Water | 6020A | 495061 |
| MB 680-495061/1-A | Method Blank | Total Recoverable | Water | 6020A | 495061 |
| LCS 680-495061/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 495061 |
| 680-143134-4 MS | SB-2017-18-82-84 | Dissolved | Water | 6020A | 495061 |
| 680-143134-4 MSD | SB-2017-18-82-84 | Dissolved | Water | 6020A | 495061 |

### Prep Batch: 495334

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-2 | SB-2017-16-52-54 | Dissolved | Water | 3005A | |
| MB 680-495334/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-495334/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-143134-2 MS | SB-2017-16-52-54 | Dissolved | Water | 3005A | |
| 680-143134-2 MSD | SB-2017-16-52-54 | Dissolved | Water | 3005A | |

### Prep Batch: 495335

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-2 | SB-2017-16-52-54 | Dissolved | Water | 3005A | |
| MB 680-495335/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-495335/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-143134-2 MS | SB-2017-16-52-54 | Dissolved | Water | 3005A | |
| 680-143134-2 MSD | SB-2017-16-52-54 | Dissolved | Water | 3005A | |

### Analysis Batch: 495430

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-2 | SB-2017-16-52-54 | Dissolved | Water | 6020A | 495334 |
| MB 680-495334/1-A | Method Blank | Total Recoverable | Water | 6020A | 495334 |
| LCS 680-495334/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 495334 |
| 680-143134-2 MS | SB-2017-16-52-54 | Dissolved | Water | 6020A | 495334 |
| 680-143134-2 MSD | SB-2017-16-52-54 | Dissolved | Water | 6020A | 495334 |

### Analysis Batch: 495534

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-1 | SB-2017-16-42-44 | Dissolved | Water | 6010C | 495062 |
| 680-143134-2 | SB-2017-16-52-54 | Dissolved | Water | 6010C | 495335 |
| 680-143134-3 | SB-2017-16-62-64 | Dissolved | Water | 6010C | 495062 |
| 680-143134-4 | SB-2017-18-82-84 | Dissolved | Water | 6010C | 495062 |
| 680-143134-5 | SB-2017-18-91-93 | Dissolved | Water | 6010C | 495062 |
| 680-143134-6 | SB-2017-15-22-24 | Dissolved | Water | 6010C | 495062 |
| 680-143134-7 | SB-2017-15-32-34 | Dissolved | Water | 6010C | 495062 |
| 680-143134-8 | SB-2017-15-37-39 | Dissolved | Water | 6010C | 495062 |
| 680-143134-9 | SB-2017-14-22-24 | Dissolved | Water | 6010C | 495062 |
| 680-143134-10 | SB-2017-16-32-34 | Dissolved | Water | 6010C | 495062 |
| 680-143134-11 | SB-2017-14-32-34 | Dissolved | Water | 6010C | 495062 |
| 680-143134-12 | SB-2017-13-22-24 | Dissolved | Water | 6010C | 495062 |
| 680-143134-13 | SB-2017-DUP-09 | Dissolved | Water | 6010C | 495062 |
| 680-143134-14 | SB-2017-13-32-34 | Dissolved | Water | 6010C | 495062 |
| 680-143134-15 | SB-2017-DUP-10 | Dissolved | Water | 6010C | 495062 |
| 680-143134-16 | SB-2017-13-41-43 | Dissolved | Water | 6010C | 495062 |
| MB 680-495062/1-A | Method Blank | Total Recoverable | Water | 6010C | 495062 |
| MB 680-495335/1-A | Method Blank | Total Recoverable | Water | 6010C | 495335 |

## Metals (Continued)

### Analysis Batch: 495534 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 680-495062/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 495062 |
| LCS 680-495335/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 495335 |
| 680-143134-2 MS | SB-2017-16-52-54 | Dissolved | Water | 6010C | 495335 |
| 680-143134-2 MSD | SB-2017-16-52-54 | Dissolved | Water | 6010C | 495335 |
| 680-143134-4 MS | SB-2017-18-82-84 | Dissolved | Water | 6010C | 495062 |
| 680-143134-4 MSD | SB-2017-18-82-84 | Dissolved | Water | 6010C | 495062 |

## General Chemistry

### Analysis Batch: 388294

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-1 | SB-2017-16-42-44 | Dissolved | Water | 9060 | |
| 680-143134-2 | SB-2017-16-52-54 | Dissolved | Water | 9060 | |
| 680-143134-3 | SB-2017-16-62-64 | Dissolved | Water | 9060 | |
| 680-143134-4 | SB-2017-18-82-84 | Dissolved | Water | 9060 | |
| 680-143134-5 | SB-2017-18-91-93 | Dissolved | Water | 9060 | |
| 680-143134-6 | SB-2017-15-22-24 | Dissolved | Water | 9060 | |
| 680-143134-7 | SB-2017-15-32-34 | Dissolved | Water | 9060 | |
| 680-143134-8 | SB-2017-15-37-39 | Dissolved | Water | 9060 | |
| MB 280-388294/35 | Method Blank | Dissolved | Water | 9060 | |
| LCS 280-388294/34 | Lab Control Sample | Dissolved | Water | 9060 | |
| 680-143134-1 MS | SB-2017-16-42-44 | Dissolved | Water | 9060 | |
| 680-143134-1 MSD | SB-2017-16-42-44 | Dissolved | Water | 9060 | |

### Analysis Batch: 388591

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-1 | SB-2017-16-42-44 | Total/NA | Water | SM 2320B | |
| 680-143134-2 | SB-2017-16-52-54 | Total/NA | Water | SM 2320B | |
| 680-143134-3 | SB-2017-16-62-64 | Total/NA | Water | SM 2320B | |
| 680-143134-4 | SB-2017-18-82-84 | Total/NA | Water | SM 2320B | |
| 680-143134-5 | SB-2017-18-91-93 | Total/NA | Water | SM 2320B | |
| 680-143134-6 | SB-2017-15-22-24 | Total/NA | Water | SM 2320B | |
| 680-143134-7 | SB-2017-15-32-34 | Total/NA | Water | SM 2320B | |
| 680-143134-8 | SB-2017-15-37-39 | Total/NA | Water | SM 2320B | |
| 680-143134-9 | SB-2017-14-22-24 | Total/NA | Water | SM 2320B | |
| 680-143134-10 | SB-2017-16-32-34 | Total/NA | Water | SM 2320B | |
| 680-143134-11 | SB-2017-14-32-34 | Total/NA | Water | SM 2320B | |
| MB 280-388591/31 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-388591/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Analysis Batch: 388729

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-9 | SB-2017-14-22-24 | Dissolved | Water | 9060 | |
| 680-143134-10 | SB-2017-16-32-34 | Dissolved | Water | 9060 | |
| 680-143134-11 | SB-2017-14-32-34 | Dissolved | Water | 9060 | |
| 680-143134-12 | SB-2017-13-22-24 | Dissolved | Water | 9060 | |
| 680-143134-13 | SB-2017-DUP-09 | Dissolved | Water | 9060 | |
| 680-143134-14 | SB-2017-13-32-34 | Dissolved | Water | 9060 | |
| 680-143134-15 | SB-2017-DUP-10 | Dissolved | Water | 9060 | |
| 680-143134-16 | SB-2017-13-41-43 | Dissolved | Water | 9060 | |

## General Chemistry (Continued)

### Analysis Batch: 388729 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| MB 280-388729/35 | Method Blank | Dissolved | Water | 9060 | |
| MB 280-388729/4 | Method Blank | Dissolved | Water | 9060 | |
| LCS 280-388729/3 | Lab Control Sample | Dissolved | Water | 9060 | |
| LCS 280-388729/34 | Lab Control Sample | Dissolved | Water | 9060 | |

### Analysis Batch: 388750

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-12 | SB-2017-13-22-24 | Total/NA | Water | SM 2320B | |
| 680-143134-13 | SB-2017-DUP-09 | Total/NA | Water | SM 2320B | |
| 680-143134-14 | SB-2017-13-32-34 | Total/NA | Water | SM 2320B | |
| 680-143134-15 | SB-2017-DUP-10 | Total/NA | Water | SM 2320B | |
| 680-143134-16 | SB-2017-13-41-43 | Total/NA | Water | SM 2320B | |
| MB 280-388750/31 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-388750/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Analysis Batch: 495236

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-143134-1 | SB-2017-16-42-44 | Total/NA | Water | 9040C | |
| 680-143134-2 | SB-2017-16-52-54 | Total/NA | Water | 9040C | |
| 680-143134-3 | SB-2017-16-62-64 | Total/NA | Water | 9040C | |
| 680-143134-10 | SB-2017-16-32-34 | Total/NA | Water | 9040C | |
| LCS 680-495236/7 | Lab Control Sample | Total/NA | Water | 9040C | |
| 680-143134-10 DU | SB-2017-16-32-34 | Total/NA | Water | 9040C | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-16-42-44

**Lab Sample ID: 680-143134-1**

**Date Collected: 09/14/17 09:27**

**Matrix: Water**

**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/19/17 20:34 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 12:39 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 02:43 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Total/NA | Analysis | 9040C | | 1 | | | 495236 | 09/19/17 14:26 | JEC | TAL SAV |
| | Instrument ID: | MANTECH | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 05:46 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388591 | 09/21/17 15:23 | A1D | TAL DEN |
| | Instrument ID: | WC-AT3 | | | | | | | | |

## Client Sample ID: SB-2017-16-52-54

**Lab Sample ID: 680-143134-2**

**Date Collected: 09/14/17 11:05**

**Matrix: Water**

**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/19/17 21:26 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495335 | 09/20/17 11:04 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/21/17 01:49 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495334 | 09/20/17 11:04 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495430 | 09/20/17 16:53 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Total/NA | Analysis | 9040C | | 1 | | | 495236 | 09/19/17 14:30 | JEC | TAL SAV |
| | Instrument ID: | MANTECH | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 06:37 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388591 | 09/21/17 15:28 | A1D | TAL DEN |
| | Instrument ID: | WC-AT3 | | | | | | | | |

## Client Sample ID: SB-2017-16-62-64

**Lab Sample ID: 680-143134-3**

**Date Collected: 09/14/17 13:00**

**Matrix: Water**

**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/19/17 22:01 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |

## Client Sample ID: SB-2017-16-62-64

**Lab Sample ID: 680-143134-3**

**Date Collected: 09/14/17 13:00**

**Matrix: Water**

**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 4 | 5 mL | 5 mL | 495261 | 09/20/17 12:52 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 13:40 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 03:39 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Total/NA | Analysis | 9040C | | 1 | | | 495236 | 09/19/17 14:34 | JEC | TAL SAV |
| | Instrument ID: MANTECH | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 06:54 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388591 | 09/21/17 15:58 | A1D | TAL DEN |
| | Instrument ID: WC-AT3 | | | | | | | | | |

## Client Sample ID: SB-2017-18-82-84

**Lab Sample ID: 680-143134-4**

**Date Collected: 09/13/17 14:55**

**Matrix: Water**

**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/19/17 22:18 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 12:16 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 02:21 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 07:11 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388591 | 09/21/17 15:37 | A1D | TAL DEN |
| | Instrument ID: WC-AT3 | | | | | | | | | |

## Client Sample ID: SB-2017-18-91-93

**Lab Sample ID: 680-143134-5**

**Date Collected: 09/13/17 17:00**

**Matrix: Water**

**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/19/17 22:36 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 13:07 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-18-91-93

**Lab Sample ID: 680-143134-5**

**Date Collected: 09/13/17 17:00**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 03:09 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 07:28 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388591 | 09/21/17 15:52 | A1D | TAL DEN |
| | Instrument ID: | WC-AT3 | | | | | | | | |

## Client Sample ID: SB-2017-15-22-24

**Lab Sample ID: 680-143134-6**

**Date Collected: 09/14/17 10:20**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/19/17 23:28 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Total/NA | Analysis | 9056A | | 2 | 5 mL | 5 mL | 495261 | 09/20/17 12:00 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 13:26 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 03:26 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 07:44 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388591 | 09/21/17 16:07 | A1D | TAL DEN |
| | Instrument ID: | WC-AT3 | | | | | | | | |

## Client Sample ID: SB-2017-15-32-34

**Lab Sample ID: 680-143134-7**

**Date Collected: 09/14/17 11:35**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/19/17 23:45 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 13:12 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 03:13 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 08:35 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-15-32-34

**Lab Sample ID: 680-143134-7**

**Date Collected: 09/14/17 11:35**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | SM 2320B | | 1 | | | 388591 | 09/21/17 16:02 | A1D | TAL DEN |
| | Instrument ID: | WC-AT3 | | | | | | | | |

## Client Sample ID: SB-2017-15-37-39

**Lab Sample ID: 680-143134-8**

**Date Collected: 09/14/17 12:55**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/20/17 00:03 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 13:59 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 03:57 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388294 | 09/20/17 08:52 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388591 | 09/21/17 15:18 | A1D | TAL DEN |
| | Instrument ID: | WC-AT3 | | | | | | | | |

## Client Sample ID: SB-2017-14-22-24

**Lab Sample ID: 680-143134-9**

**Date Collected: 09/14/17 15:00**
**Matrix: Water**
**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/20/17 00:55 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 13:21 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 03:22 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388729 | 09/22/17 23:24 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388591 | 09/21/17 15:32 | A1D | TAL DEN |
| | Instrument ID: | WC-AT3 | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-16-32-34 — Lab Sample ID: 680-143134-10

**Date Collected: 09/13/17 15:40** — **Matrix: Water**
**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/20/17 01:12 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Total/NA | Analysis | 9056A | | 2 | 5 mL | 5 mL | 495261 | 09/20/17 11:43 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 12:44 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 02:47 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Total/NA | Analysis | 9040C | | 1 | | | 495236 | 09/19/17 14:38 | JEC | TAL SAV |
| | Instrument ID: MANTECH | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388729 | 09/22/17 23:41 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388591 | 09/21/17 15:09 | A1D | TAL DEN |
| | Instrument ID: WC-AT3 | | | | | | | | | |

## Client Sample ID: SB-2017-14-32-34 — Lab Sample ID: 680-143134-11

**Date Collected: 09/14/17 16:20** — **Matrix: Water**
**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/20/17 01:30 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 12:49 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 02:52 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388729 | 09/22/17 23:58 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388591 | 09/21/17 15:14 | A1D | TAL DEN |
| | Instrument ID: WC-AT3 | | | | | | | | | |

## Client Sample ID: SB-2017-13-22-24 — Lab Sample ID: 680-143134-12

**Date Collected: 09/15/17 09:50** — **Matrix: Water**
**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/20/17 01:47 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |

## Client Sample ID: SB-2017-13-22-24

**Lab Sample ID: 680-143134-12**

**Date Collected: 09/15/17 09:50**

**Matrix: Water**

**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 4 | 5 mL | 5 mL | 495261 | 09/20/17 11:08 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 13:31 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 03:31 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388729 | 09/23/17 00:57 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388750 | 09/22/17 21:10 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-DUP-09

**Lab Sample ID: 680-143134-13**

**Date Collected: 09/15/17 09:55**

**Matrix: Water**

**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/20/17 02:57 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Total/NA | Analysis | 9056A | | 4 | 5 mL | 5 mL | 495261 | 09/20/17 10:50 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 13:45 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 03:44 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388729 | 09/23/17 01:13 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388750 | 09/22/17 21:42 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-13-32-34

**Lab Sample ID: 680-143134-14**

**Date Collected: 09/15/17 11:30**

**Matrix: Water**

**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/20/17 03:14 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Total/NA | Analysis | 9056A | | 10 | 5 mL | 5 mL | 495261 | 09/20/17 10:33 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-13-32-34 — Lab Sample ID: 680-143134-14

**Date Collected: 09/15/17 11:30** — **Matrix: Water**
**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 13:03 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 03:05 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388729 | 09/23/17 02:04 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388750 | 09/22/17 21:37 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-DUP-10 — Lab Sample ID: 680-143134-15

**Date Collected: 09/15/17 11:30** — **Matrix: Water**
**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/20/17 03:31 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Total/NA | Analysis | 9056A | | 10 | 5 mL | 5 mL | 495261 | 09/20/17 10:16 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 13:35 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 03:35 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060 | | 1 | | | 388729 | 09/23/17 02:18 | CCJ | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388750 | 09/22/17 21:27 | A1D | TAL DEN |
| | Instrument ID: WC_AT2 | | | | | | | | | |

## Client Sample ID: SB-2017-13-41-43 — Lab Sample ID: 680-143134-16

**Date Collected: 09/15/17 13:15** — **Matrix: Water**
**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 495163 | 09/20/17 03:49 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 495062 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 495534 | 09/20/17 13:17 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 495061 | 09/18/17 12:05 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 495330 | 09/20/17 03:17 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Client Sample ID: SB-2017-13-41-43

**Lab Sample ID: 680-143134-16**

**Date Collected: 09/15/17 13:15**

**Matrix: Water**

**Date Received: 09/16/17 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060 | | 1 | | | 388729 | 09/23/17 02:35 | CCJ | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 388750 | 09/22/17 21:32 | A1D | TAL DEN |
| | Instrument ID: | WC_AT2 | | | | | | | | |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 1 of: 2

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affiliation
Lynne Klosterman Hamb. Adm

Sampler(s) Signature(s)
Lynne Klosterman

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | PH TEST | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-16-42-44 | 9/14/17 | 0927 | GW | 4 | X | X | X | X | ✓ | | | | | | |
| SB-2017-16-52-54 | 9/14/17 | 1105 | GW | 4 | X | X | X | X | ✓ | | | | | | |
| SB-2017-16-62-64 | 9/14/17 | 1300 | GW | 4 | X | X | X | X | ✓ | | | | | | |
| SB-2017-18-82-84 | 9/13/17 | 1455 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-18-91-93 | 9/13/17 | 1700 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-15-22-24 | 9/14/17 | 1020 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-15-32-34 | 9/14/17 | 1135 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-15-37-39 | 9/14/17 | 1255 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-14-22-24 | 9/14/17 | 1500 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |

680-143134-01 Chain of Custody

Shipping Details: courier pick up

← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | | 9/15/17 | | | 9-15-17 | 1410 |
| | | | | 9-15-17 | 1800 | | | |
| | | | | | | | 9/16/17 | 1000 |

Additional Comments:
* Dissolved Metals include: Fe, Mn (6010C); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐
On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

1.6(CH+Q.C)1.8

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 2 of: 2

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affiliation: Kara B. Anderson

Sampler(s) Signature(s)

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue, Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | pH Test | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-16-32-34 | 9/13/17 | 1540 | GW | 4 | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| SB-2017-14-32-34 | 9/14/17 | 1620 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | |
| SB-2017-13-22-24 | 9/15/17 | 950 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | |
| SB-2017-DVP-09 | 9/15/17 | 955 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | |
| SB-2017-13-32-34 | 9/15/17 | 1130 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | |
| SB-2017-DVP-10 | 9/15/17 | 1135 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | |
| SB-2017-13-41-43 | 9/15/17 | 1315 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | |

680-143134-02 Chain of Custody

Shipping Details: courier pick up

← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | | 9/15/17 | | | 9-15-17 | 1410 |
| | | | | 9-15-17 | 1800 | | 9/16/17 | 1000 |

Additional Comments:
* = Dissolved Metals include: Fe, Mn (6010); As (6020)

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal #

Preserve Where Applicable ☐
On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

1.6(CS+0.2)1.8

| | | | | | |
|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record

Page: 1 of: 2

KOMAN Government Solutions, LLC

Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752

Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affiliation: Lynne Klosterman Hamb. Alpsn

Sampler(s) Signature(s): Lynne Klosterman

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue
Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

Analyses Requested

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | pH Test | | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-16-42-44 | 9/14/17 | 0927 | GW | 4 | X | X | X | X | ✓ | | | | | | | |
| SB-2017-16-52-54 | 9/14/17 | 1105 | GW | 4 | X | X | X | X | ✓ | | | | | | | |
| SB-2017-16-62-64 | 9/14/17 | 1300 | GW | 4 | X | X | X | X | ✓ | | | | | | | |
| SB-2017-18-82-84 | 9/13/17 | 1455 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-18-91-93 | 9/13/17 | 1700 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-15-22-24 | 9/14/17 | 1020 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-15-32-34 | 9/14/17 | 1135 | bw | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-15-37-39 | 9/14/17 | 1255 | bw | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| SB-2017-14-22-24 | 9/14/17 | 1500 | bw | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | | |

680-143134 Chain of Custody

Shipping Details: courier pick up ← Total Number of Containers

| Date Out: | Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|---|
| Returned: | Via: | | [signature] | 9/15/17 | | | [signature] | 9-15-17 | 1410 |
| Additional Comments: | | | [signature] | 9-15-17 | 1800 | | | | |
| * = Dissolved Metals include: Fe, Mn (6010); As (6020) | | | | | | TAD | Lauren Lauf | 9/16/17 | 0850 |

email logins and results to:
lekes@komangs.com

**Lab Comments**

Seal # _____ Preserve Where Applicable ☐ On ICE ☐

Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

1.8, 2.6 CF0.1 IR#7 Transfered by LL 9/16/17

360325-Boston

| 1081-00X | PO#17-757 | Devens - SHL EPA SOW Phase1_Aug-Sept 2017 |
|---|---|---|

# Chain of Custody Record



KOMAN Government Solutions, LLC
Address: 293 Boston Post Road West, Suite 100
Marlborough, MA 01752
Phone: 508-366-7442 Cell: 508-367-7190

Sampled by [Print Name(s)]/Affilliation: Kara L. Anderson

Sampler(s) Signature(s)

Laboratory: Test America - Savannah
Address: 5102 Laroche Avenue, Savannah, GA 31404
Contact: Jerry Lanier (912)354-7858
Regulatory Facility No.
Project Name: Devens Shepley's Hill Landfill
Sampling QAP No.:
Approval Date:
TAT
Other:

Preservatives (see codes): N I I S S I O S

| Field Sample ID | Sampled Date | Sampled Time | Matrix (see codes) | Number of Containers | Dissolved Metals*-SW6010/6020 1-250 ml poly (HNO3) | DOC/SW9060 1-500-ml glass (H2SO4)/field filtered | Sulfate/Chloride-SW9056 1-125-ml poly | Alkalinity/SM2320B 1-125-ml poly | pH Test | | | | | Remarks | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-2017-16-32-34 | 9/13/17 | 1540 | GW | 4 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | |
| SB-2017-14-32-34 | 9/14/17 | 1620 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-13-22-24 | 9/15/17 | 950 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-DUP-09 | 9/15/17 | 955 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-13-32-34 | 9/15/17 | 1130 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-DUP-10 | 9/15/17 | 1135 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| SB-2017-13-41-43 | 9/15/17 | 1315 | GW | 4 | ✓ | ✓ | ✓ | ✓ | | | | | | | |

Total Number of Containers

Shipping Details: courier pick up

| Date Out: Via: | Item No. | Relinquished by/Affiliation | Date | Time | | Accepted by/Affiliation | Date | Time |
|---|---|---|---|---|---|---|---|---|
| Returned: Via: | | | 9/15/17 | | | | 9/15/17 | 1410 |
| Additional Comments: | | | 9-15-17 | 1400 | | | | |
| * = Dissolved Metals include: Fe, Mn (6010); As (6020) | | | | | AD | Lauren Lacy | 9/16/17 | 0850 |

email logins and results to:
lekes@komangs.com

**Lab Comments**
Seal #
Preserve Where Applicable ☐
On ICE ☐
Temperature _____ C

☐ NJ Reduced
☐ NJ Full
☐ Full CLP
☐ Disk Deliverable
☐ Other (Specify)

| | | | | | | |
|---|---|---|---|---|---|---|
| MATRIX CODES: | GW = Groundwa | SE = Sediment | SP = Soil | SW = Surface Water | W = Water (Blanks) | O = Other |
| PRESERVATIVE CODES: | H = HCL + Ice | I = Ice Only | N = Nitric Acid + Ice | S = Sulfuric Acid + Ice | M = Methanol | O = Other |
| COLLECTION METHOD CODES: | C = Composite | G=Grab | P= Pumping | | | O = Other |

# Login Sample Receipt Checklist

Client: KOMAN Government Solutions, LLC

Job Number: 680-143134-1

**Login Number: 143134**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: Ragnaldsen, Amy E**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| | AFCEE | | SAVLAB | |
| Alabama | State Program | 4 | 41450 | 06-30-18 |
| Alaska | State Program | 10 | | 06-30-18 |
| Alaska (UST) | State Program | 10 | UST-104 | 11-05-17 * |
| Arizona | State Program | 9 | AZ808 | 12-14-17 |
| Arkansas DEQ | State Program | 6 | 88-0692 | 02-01-18 |
| California | State Program | 9 | 2939 | 06-30-17 * |
| Colorado | State Program | 8 | N/A | 12-31-17 |
| Connecticut | State Program | 1 | PH-0161 | 03-31-19 |
| Florida | NELAP | 4 | E87052 | 06-30-18 |
| GA Dept. of Agriculture | State Program | 4 | N/A | 06-12-18 |
| Georgia | State Program | 4 | 803 | 06-30-18 |
| Guam | State Program | 9 | 15-005r | 04-16-18 |
| Hawaii | State Program | 9 | N/A | 06-30-18 |
| Illinois | NELAP | 5 | 200022 | 11-30-17 |
| Indiana | State Program | 5 | N/A | 06-30-18 |
| Iowa | State Program | 7 | 353 | 06-30-19 |
| Kentucky (DW) | State Program | 4 | 90084 | 12-31-17 |
| Kentucky (UST) | State Program | 4 | 18 | 06-30-18 |
| Kentucky (WW) | State Program | 4 | 90084 | 12-31-17 |
| L-A-B | DoD ELAP | | L2463 | 09-22-19 |
| L-A-B | ISO/IEC 17025 | | L2463.01 | 09-22-19 |
| Louisiana | NELAP | 6 | 30690 | 06-30-18 |
| Louisiana (DW) | NELAP | 6 | LA160019 | 12-31-17 |
| Maine | State Program | 1 | GA00006 | 09-24-18 |
| Maryland | State Program | 3 | 250 | 12-31-17 |
| Massachusetts | State Program | 1 | M-GA006 | 06-30-18 |
| Michigan | State Program | 5 | 9925 | 06-30-17 * |
| Mississippi | State Program | 4 | N/A | 06-30-18 |
| Nebraska | State Program | 7 | TestAmerica-Savannah | 06-30-18 |
| New Jersey | NELAP | 2 | GA769 | 06-30-18 |
| New Mexico | State Program | 6 | N/A | 06-30-18 |
| New York | NELAP | 2 | 10842 | 03-31-18 |
| North Carolina (DW) | State Program | 4 | 13701 | 07-31-18 |
| North Carolina (WW/SW) | State Program | 4 | 269 | 12-31-17 |
| Oklahoma | State Program | 6 | 9984 | 08-31-18 |
| Pennsylvania | NELAP | 3 | 68-00474 | 06-30-18 |
| Puerto Rico | State Program | 2 | GA00006 | 12-31-17 |
| South Carolina | State Program | 4 | 98001 | 06-30-17 * |
| Tennessee | State Program | 4 | TN02961 | 06-30-18 |
| Texas | NELAP | 6 | T104704185-16-9 | 11-30-17 |
| Texas | State Program | 6 | T104704185 | 06-30-18 |
| US Fish & Wildlife | Federal | | LE058448-0 | 07-31-18 |
| USDA | Federal | | SAV 3-04 | 06-14-20 * |
| Virginia | NELAP | 3 | 460161 | 06-14-18 |
| Washington | State Program | 10 | C805 | 06-10-18 |
| West Virginia (DW) | State Program | 3 | 9950C | 12-31-17 |
| West Virginia DEP | State Program | 3 | 094 | 06-30-18 |
| Wisconsin | State Program | 5 | 999819810 | 08-31-18 |
| Wyoming | State Program | 8 | 8TMS-L | 06-30-16 * |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Accreditation/Certification Summary

Client: KOMAN Government Solutions, LLC
Project/Site: Devens - SHL EPA SOW Phase 1

TestAmerica Job ID: 680-143134-1

## Laboratory: TestAmerica Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |

eurofins | Environment Testing America

# ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-191218-1
Client Project/Site: Fort Devens

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

*Authorized for release by:*
*11/20/2020 9:32:18 AM*

Kathryn Smith, Client Service Manager
(912)250-0275
Kathy.Smith@Eurofinset.com

LINKS

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*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

# Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Glossary (Continued)

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| TNTC | Too Numerous To Count |

# Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 680-191218-1 | SHM-13-02-FAL20 | Water | 11/05/20 15:00 | 11/07/20 09:55 | |
| 680-191218-2 | SHM-13-04-FAL20 | Water | 11/06/20 10:10 | 11/07/20 09:55 | |
| 680-191218-3 | SHM-13-05-FAL20 | Water | 11/06/20 09:00 | 11/07/20 09:55 | |
| 680-191218-4 | SHM-13-07-FAL20 | Water | 11/05/20 16:00 | 11/07/20 09:55 | |
| 680-191218-5 | SHP-2016-1A-FAL20 | Water | 11/05/20 15:40 | 11/07/20 09:55 | |
| 680-191218-6 | SHP-2016-1B-FAL20 | Water | 11/05/20 16:30 | 11/07/20 09:55 | |
| 680-191218-7 | SHP-2016-2A-FAL20 | Water | 11/06/20 12:30 | 11/07/20 09:55 | |
| 680-191218-8 | SHP-2016-2B-FAL20 | Water | 11/06/20 14:00 | 11/07/20 09:55 | |
| 680-191218-9 | SHP-2016-4A-FAL20 | Water | 11/06/20 10:00 | 11/07/20 09:55 | |
| 680-191218-10 | SHP-2016-4B-FAL20 | Water | 11/06/20 11:20 | 11/07/20 09:55 | |
| 680-191218-11 | SHM-05-41A-FAL20 | Water | 11/06/20 13:50 | 11/07/20 09:55 | |
| 680-191218-12 | SHM-05-41B-FAL20 | Water | 11/06/20 14:55 | 11/07/20 09:55 | |
| 680-191218-13 | SHM-05-41C-FAL20 | Water | 11/06/20 12:10 | 11/07/20 09:55 | |
| 680-191218-14 | EPA-PZ-2012-7A-FAL20 | Water | 11/06/20 09:45 | 11/07/20 09:55 | |
| 680-191218-15 | EPA-PZ-2012-7B-FAL20 | Water | 11/06/20 10:50 | 11/07/20 09:55 | |

## Job ID: 680-191218-1

**Laboratory: Eurofins TestAmerica, Savannah**

**Narrative**

# CASE NARRATIVE
# Client: Seres Engineering & Services LLC
# Project: Fort Devens

## Report Number: 680-191218-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 11/07/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 1.8º C, 2.3º C and 3.6º C.

**METALS (ICP) - DISSOLVED**
Samples SHM-13-02-FAL20 (680-191218-1), SHM-13-04-FAL20 (680-191218-2), SHM-13-05-FAL20 (680-191218-3), SHM-13-07-FAL20 (680-191218-4), SHP-2016-1A-FAL20 (680-191218-5), SHP-2016-1B-FAL20 (680-191218-6), SHP-2016-2A-FAL20 (680-191218-7), SHP-2016-2B-FAL20 (680-191218-8), SHP-2016-4A-FAL20 (680-191218-9), SHP-2016-4B-FAL20 (680-191218-10), SHM-05-41A-FAL20 (680-191218-11), SHM-05-41B-FAL20 (680-191218-12), SHM-05-41C-FAL20 (680-191218-13), EPA-PZ-2012-7A-FAL20 (680-191218-14) and EPA-PZ-2012-7B-FAL20 (680-191218-15) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/08/2020 and analyzed on 11/10/2020.

Manganese recovered low for the MS/MSD of sample SHM-05-41C-FAL20 (680-191218-13) in batch 680-643527.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples SHM-13-02-FAL20 (680-191218-1), SHM-13-04-FAL20 (680-191218-2), SHM-13-05-FAL20 (680-191218-3), SHM-13-07-FAL20 (680-191218-4), SHP-2016-1A-FAL20 (680-191218-5), SHP-2016-1B-FAL20 (680-191218-6), SHP-2016-2A-FAL20 (680-191218-7), SHP-2016-2B-FAL20 (680-191218-8), SHP-2016-4A-FAL20 (680-191218-9), SHP-2016-4B-FAL20 (680-191218-10), SHM-05-41A-FAL20 (680-191218-11), SHM-05-41B-FAL20 (680-191218-12), SHM-05-41C-FAL20 (680-191218-13), EPA-PZ-2012-7A-FAL20 (680-191218-14) and EPA-PZ-2012-7B-FAL20 (680-191218-15) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 11/08/2020 and analyzed on 11/11/2020.

Arsenic recovered high for the MS/MSD of sample SHM-13-04-FAL20 (680-191218-2) in batch 680-643653. Arsenic exceeded the RPD limit.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples SHM-13-02-FAL20 (680-191218-1), SHM-13-04-FAL20 (680-191218-2), SHM-13-05-FAL20 (680-191218-3), SHM-13-07-FAL20 (680-191218-4), SHP-2016-1A-FAL20 (680-191218-5), SHP-2016-1B-FAL20 (680-191218-6), SHP-2016-2A-FAL20 (680-191218-7), SHP-2016-2B-FAL20 (680-191218-8), SHP-2016-4A-FAL20 (680-191218-9), SHP-2016-4B-FAL20 (680-191218-10), SHM-05-41A-FAL20 (680-191218-11), SHM-05-41B-FAL20 (680-191218-12), SHM-05-41C-FAL20 (680-191218-13), EPA-PZ-2012-7A-FAL20 (680-191218-14) and EPA-PZ-2012-7B-FAL20 (680-191218-15) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 11/13/2020 and 11/16/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**
Samples SHM-13-02-FAL20 (680-191218-1), SHM-13-04-FAL20 (680-191218-2), SHM-13-05-FAL20 (680-191218-3), SHM-13-07-FAL20

## Job ID: 680-191218-1 (Continued)

### Laboratory: Eurofins TestAmerica, Savannah (Continued)

(680-191218-4), SHP-2016-1A-FAL20 (680-191218-5), SHP-2016-1B-FAL20 (680-191218-6), SHP-2016-2A-FAL20 (680-191218-7), SHP-2016-2B-FAL20 (680-191218-8), SHP-2016-4A-FAL20 (680-191218-9), SHP-2016-4B-FAL20 (680-191218-10), SHM-05-41A-FAL20 (680-191218-11), SHM-05-41B-FAL20 (680-191218-12), SHM-05-41C-FAL20 (680-191218-13), EPA-PZ-2012-7A-FAL20 (680-191218-14) and EPA-PZ-2012-7B-FAL20 (680-191218-15) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 11/14/2020, 11/15/2020, 11/16/2020 and 11/18/2020.

Samples SHM-05-41B-FAL20 (680-191218-12)[5X] and SHM-05-41C-FAL20 (680-191218-13)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL ORGANIC CARBON (TOC)**

Samples SHM-13-02-FAL20 (680-191218-1), SHM-13-04-FAL20 (680-191218-2), SHM-13-05-FAL20 (680-191218-3), SHM-13-07-FAL20 (680-191218-4), SHP-2016-1A-FAL20 (680-191218-5), SHP-2016-1B-FAL20 (680-191218-6), SHP-2016-2A-FAL20 (680-191218-7), SHP-2016-2B-FAL20 (680-191218-8), SHP-2016-4A-FAL20 (680-191218-9), SHP-2016-4B-FAL20 (680-191218-10), SHM-05-41A-FAL20 (680-191218-11), SHM-05-41B-FAL20 (680-191218-12), SHM-05-41C-FAL20 (680-191218-13), EPA-PZ-2012-7A-FAL20 (680-191218-14) and EPA-PZ-2012-7B-FAL20 (680-191218-15) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 11/18/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Client Sample ID: SHM-13-02-FAL20

**Lab Sample ID: 680-191218-1**
**Date Collected: 11/05/20 15:00**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 41 | | 0.50 | 0.20 | mg/L | | | 11/15/20 00:54 | 1 |
| Sulfate | 4.4 | | 1.0 | 0.40 | mg/L | | | 11/15/20 00:54 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 34 | J | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 21:28 | 1 |
| Manganese | 74 | | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 21:28 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 16:20 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 110 | | 10 | 3.1 | mg/L | | | 11/13/20 18:26 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.5 | | 1.0 | 0.35 | mg/L | | | 11/18/20 06:27 | 1 |

## Client Sample ID: SHM-13-04-FAL20

**Lab Sample ID: 680-191218-2**
**Date Collected: 11/06/20 10:10**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 100 | | 0.50 | 0.20 | mg/L | | | 11/14/20 23:11 | 1 |
| Sulfate | 10 | | 1.0 | 0.40 | mg/L | | | 11/14/20 23:11 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 2400 | | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 20:41 | 1 |
| Manganese | 160 | | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 20:41 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 260 | J | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 15:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 36 | | 10 | 3.1 | mg/L | | | 11/13/20 18:31 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.93 | J | 1.0 | 0.35 | mg/L | | | 11/18/20 05:04 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Client Sample ID: SHM-13-05-FAL20

**Lab Sample ID: 680-191218-3**

**Date Collected: 11/06/20 09:00**
**Date Received: 11/07/20 09:55**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 38 | | 0.50 | 0.20 | mg/L | | | 11/15/20 01:07 | 1 |
| Sulfate | 7.9 | | 1.0 | 0.40 | mg/L | | | 11/15/20 01:07 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 1000 | | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 21:32 | 1 |
| Manganese | 1100 | | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 21:32 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 6.4 | | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 16:23 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 140 | | 10 | 3.1 | mg/L | | | 11/16/20 21:29 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.0 | | 1.0 | 0.35 | mg/L | | | 11/18/20 06:43 | 1 |

## Client Sample ID: SHM-13-07-FAL20

**Lab Sample ID: 680-191218-4**

**Date Collected: 11/05/20 16:00**
**Date Received: 11/07/20 09:55**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 170 | | 0.50 | 0.20 | mg/L | | | 11/15/20 01:20 | 1 |
| Sulfate | 8.4 | | 1.0 | 0.40 | mg/L | | | 11/15/20 01:20 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 15000 | | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 22:09 | 1 |
| Manganese | 2000 | | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 22:09 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 420 | | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 16:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 44 | | 10 | 3.1 | mg/L | | | 11/16/20 21:56 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.97 | J | 1.0 | 0.35 | mg/L | | | 11/18/20 07:00 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Client Sample ID: SHP-2016-1A-FAL20

**Lab Sample ID: 680-191218-5**

**Date Collected: 11/05/20 15:40**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.53 | | 0.50 | 0.20 | mg/L | | | 11/15/20 01:33 | 1 |
| Sulfate | 4.5 | | 1.0 | 0.40 | mg/L | | | 11/15/20 01:33 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 240 | | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 22:32 | 1 |
| Manganese | 6.6 | J | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 22:32 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 17:04 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 16 | | 10 | 3.1 | mg/L | | | 11/16/20 22:06 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.60 | J | 1.0 | 0.35 | mg/L | | | 11/18/20 07:17 | 1 |

## Client Sample ID: SHP-2016-1B-FAL20

**Lab Sample ID: 680-191218-6**

**Date Collected: 11/05/20 16:30**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.0 | | 0.50 | 0.20 | mg/L | | | 11/15/20 03:16 | 1 |
| Sulfate | 2.6 | | 1.0 | 0.40 | mg/L | | | 11/15/20 03:16 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 24000 | | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 21:41 | 1 |
| Manganese | 1100 | | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 21:41 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 140 | | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 16:30 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 91 | | 10 | 3.1 | mg/L | | | 11/16/20 22:11 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.8 | | 1.0 | 0.35 | mg/L | | | 11/18/20 07:36 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Client Sample ID: SHP-2016-2A-FAL20

**Lab Sample ID: 680-191218-7**

**Date Collected: 11/06/20 12:30**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.2 | | 0.50 | 0.20 | mg/L | | | 11/15/20 02:37 | 1 |
| Sulfate | 3.6 | | 1.0 | 0.40 | mg/L | | | 11/15/20 02:37 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 120 | | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 22:05 | 1 |
| Manganese | 290 | | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 22:05 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 8.5 | | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 16:46 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 57 | | 10 | 3.1 | mg/L | | | 11/16/20 22:16 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.69 | J | 1.0 | 0.35 | mg/L | | | 11/18/20 07:53 | 1 |

## Client Sample ID: SHP-2016-2B-FAL20

**Lab Sample ID: 680-191218-8**

**Date Collected: 11/06/20 14:00**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | | 0.50 | 0.20 | mg/L | | | 11/15/20 03:29 | 1 |
| Sulfate | 3.2 | | 1.0 | 0.40 | mg/L | | | 11/15/20 03:29 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 43000 | | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 21:46 | 1 |
| Manganese | 2400 | | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 21:46 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 520 | | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 16:33 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/16/20 22:19 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.8 | | 1.0 | 0.35 | mg/L | | | 11/18/20 08:13 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Client Sample ID: SHP-2016-4A-FAL20

**Lab Sample ID: 680-191218-9**

**Date Collected: 11/06/20 10:00**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 22 | | 0.50 | 0.20 | mg/L | | | 11/15/20 03:42 | 1 |
| Sulfate | 5.1 | | 1.0 | 0.40 | mg/L | | | 11/15/20 03:42 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 48000 | | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 21:55 | 1 |
| Manganese | 2600 | | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 21:55 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1700 | | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 16:39 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 160 | | 10 | 3.1 | mg/L | | | 11/16/20 22:25 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.7 | | 1.0 | 0.35 | mg/L | | | 11/18/20 08:28 | 1 |

## Client Sample ID: SHP-2016-4B-FAL20

**Lab Sample ID: 680-191218-10**

**Date Collected: 11/06/20 11:20**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.2 | | 0.50 | 0.20 | mg/L | | | 11/15/20 03:55 | 1 |
| Sulfate | 4.6 | | 1.0 | 0.40 | mg/L | | | 11/15/20 03:55 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 33 | J | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 22:28 | 1 |
| Manganese | 110 | | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 22:28 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 17:01 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 17 | | 10 | 3.1 | mg/L | | | 11/16/20 22:29 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.84 | J | 1.0 | 0.35 | mg/L | | | 11/18/20 08:47 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Client Sample ID: SHM-05-41A-FAL20

**Lab Sample ID: 680-191218-11**
**Date Collected: 11/06/20 13:50**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.9 | | 0.50 | 0.20 | mg/L | | | 11/15/20 04:08 | 1 |
| Sulfate | 6.5 | | 1.0 | 0.40 | mg/L | | | 11/15/20 04:08 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 4800 | | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 21:51 | 1 |
| Manganese | 170 | | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 21:51 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 18 | | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 16:36 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 36 | | 10 | 3.1 | mg/L | | | 11/16/20 22:34 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.86 | J | 1.0 | 0.35 | mg/L | | | 11/18/20 10:24 | 1 |

## Client Sample ID: SHM-05-41B-FAL20

**Lab Sample ID: 680-191218-12**
**Date Collected: 11/06/20 14:55**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 48 | | 2.5 | 1.0 | mg/L | | | 11/14/20 21:15 | 5 |
| Sulfate | 2.5 | J | 5.0 | 2.0 | mg/L | | | 11/14/20 21:15 | 5 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 35000 | | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 21:37 | 1 |
| Manganese | 1100 | | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 21:37 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 570 | | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 16:27 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 86 | | 10 | 3.1 | mg/L | | | 11/16/20 22:39 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.7 | | 1.0 | 0.35 | mg/L | | | 11/18/20 10:45 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Client Sample ID: SHM-05-41C-FAL20

**Lab Sample ID: 680-191218-13**

**Date Collected: 11/06/20 12:10**
**Date Received: 11/07/20 09:55**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 2.4 | J M | 1.0 | 0.40 | mg/L | | | 11/16/20 17:16 | 1 |

### Method: 9056A - Anions, Ion Chromatography - DL

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 380 | | 5.0 | 2.0 | mg/L | | | 11/18/20 09:09 | 10 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 14000 | | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 21:04 | 1 |
| Manganese | 2600 | J | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 21:04 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 610 | J | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 16:05 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 350 | | 10 | 3.1 | mg/L | | | 11/16/20 22:59 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 3.2 | | 1.0 | 0.35 | mg/L | | | 11/18/20 09:06 | 1 |

## Client Sample ID: EPA-PZ-2012-7A-FAL20

**Lab Sample ID: 680-191218-14**

**Date Collected: 11/06/20 09:45**
**Date Received: 11/07/20 09:55**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 100 | | 0.50 | 0.20 | mg/L | | | 11/15/20 04:21 | 1 |
| Sulfate | 8.2 | | 1.0 | 0.40 | mg/L | | | 11/15/20 04:21 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 200 | | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 22:00 | 1 |
| Manganese | 3.0 | J | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 22:00 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 16:42 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 24 | | 10 | 3.1 | mg/L | | | 11/16/20 23:03 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.97 | J | 1.0 | 0.35 | mg/L | | | 11/18/20 11:04 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Client Sample ID: EPA-PZ-2012-7B-FAL20

**Lab Sample ID: 680-191218-15**

**Date Collected: 11/06/20 10:50**
**Date Received: 11/07/20 09:55**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.4 | | 0.50 | 0.20 | mg/L | | | 11/15/20 04:34 | 1 |
| Sulfate | 2.8 | | 1.0 | 0.40 | mg/L | | | 11/15/20 04:34 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 21000 | | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 22:23 | 1 |
| Manganese | 2500 | | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 22:23 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1300 | | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 16:58 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 52 | | 10 | 3.1 | mg/L | | | 11/16/20 23:08 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.1 | | 1.0 | 0.35 | mg/L | | | 11/18/20 11:20 | 1 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-644070/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644070**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/14/20 16:12 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/14/20 16:12 | 1 |

**Lab Sample ID: LCS 680-644070/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644070**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.99 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 10.7 | | mg/L | | 107 | 87 - 112 |

**Lab Sample ID: LCSD 680-644070/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644070**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.0 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.8 | | mg/L | | 108 | 87 - 112 | 1 | 15 |

**Lab Sample ID: LLCS 680-644070/5** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644070**

| Analyte | Spike Added | LLCS Result | LLCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 0.500 | 0.525 | | mg/L | | 105 | |
| Sulfate | 1.00 | 1.39 | | mg/L | | 139 | |

**Lab Sample ID: 680-191218-2 MS** — **Client Sample ID: SHM-13-04-FAL20 MS**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644070**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 100 | | 10.0 | 112 | 4 | mg/L | | 91 | 87 - 111 |
| Sulfate | 10 | | 10.0 | 20.4 | | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: 680-191218-2 MSD** — **Client Sample ID: SHM-13-04-FAL20 MSD**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644070**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 100 | | 10.0 | 112 | 4 | mg/L | | 91 | 87 - 111 | 0 | 15 |
| Sulfate | 10 | | 10.0 | 20.5 | | mg/L | | 102 | 87 - 112 | 0 | 15 |

**Lab Sample ID: MB 680-644081/33** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644081**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/15/20 01:59 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/15/20 01:59 | 1 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: LCS 680-644081/34**
**Matrix: Water**
**Analysis Batch: 644081**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.98 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 10.8 | | mg/L | | 108 | 87 - 112 |

**Lab Sample ID: LCSD 680-644081/35**
**Matrix: Water**
**Analysis Batch: 644081**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.98 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 11.0 | | mg/L | | 110 | 87 - 112 | 2 | 15 |

**Lab Sample ID: 680-191218-7 MS**
**Matrix: Water**
**Analysis Batch: 644081**

**Client Sample ID: SHP-2016-2A-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.2 | | 10.0 | 12.4 | | mg/L | | 102 | 87 - 111 |
| Sulfate | 3.6 | | 10.0 | 13.8 | | mg/L | | 102 | 87 - 112 |

**Lab Sample ID: 680-191218-7 MSD**
**Matrix: Water**
**Analysis Batch: 644081**

**Client Sample ID: SHP-2016-2A-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.2 | | 10.0 | 12.4 | | mg/L | | 102 | 87 - 111 | 0 | 15 |
| Sulfate | 3.6 | | 10.0 | 13.9 | | mg/L | | 102 | 87 - 112 | 0 | 15 |

**Lab Sample ID: MB 680-644230/2**
**Matrix: Water**
**Analysis Batch: 644230**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/16/20 12:25 | 1 |
| Sulfate | 0.40 | U M | 1.0 | 0.40 | mg/L | | | 11/16/20 12:25 | 1 |

**Lab Sample ID: LCS 680-644230/3**
**Matrix: Water**
**Analysis Batch: 644230**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.0 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 10.7 | | mg/L | | 107 | 87 - 112 |

**Lab Sample ID: LCSD 680-644230/4**
**Matrix: Water**
**Analysis Batch: 644230**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.0 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.6 | | mg/L | | 106 | 87 - 112 | 0 | 15 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: 680-191218-13 MS** — **Client Sample ID: SHM-05-41C-FAL20 MS**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644230**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 2.4 | J M | 10.0 | 12.3 | M | mg/L | | 99 | 87 - 112 | | |

**Lab Sample ID: 680-191218-13 MSD** — **Client Sample ID: SHM-05-41C-FAL20 MSD**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644230**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 2.4 | J M | 10.0 | 12.3 | M | mg/L | | 99 | 87 - 112 | 0 | 15 |

**Lab Sample ID: MB 680-644485/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644485**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/18/20 08:18 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/18/20 08:18 | 1 |

**Lab Sample ID: LCS 680-644485/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644485**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.2 | | mg/L | | 102 | 87 - 111 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: LCSD 680-644485/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644485**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.2 | | mg/L | | 102 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.2 | | mg/L | | 102 | 87 - 112 | 0 | 15 |

## Method: 9056A - Anions, Ion Chromatography - DL

**Lab Sample ID: 680-191218-13 MS** — **Client Sample ID: SHM-05-41C-FAL20 MS**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644485**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride - DL | 380 | | 100 | 478 | | mg/L | | 102 | 87 - 111 | | |

**Lab Sample ID: 680-191218-13 MSD** — **Client Sample ID: SHM-05-41C-FAL20 MSD**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644485**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride - DL | 380 | | 100 | 480 | | mg/L | | 105 | 87 - 111 | 0 | 15 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-642998/1-A**
**Matrix: Water**
**Analysis Batch: 643527**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 642998**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/08/20 16:13 | 11/10/20 20:32 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/08/20 16:13 | 11/10/20 20:32 | 1 |

**Lab Sample ID: LCS 680-642998/2-A**
**Matrix: Water**
**Analysis Batch: 643527**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 642998**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 5020 | | ug/L | | 100 | 87 - 115 |
| Manganese | 400 | 407 | | ug/L | | 102 | 90 - 114 |

**Lab Sample ID: 680-191218-2 MS**
**Matrix: Water**
**Analysis Batch: 643527**

**Client Sample ID: SHM-13-04-FAL20 MS**
**Prep Type: Dissolved**
**Prep Batch: 642998**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 2400 | | 5000 | 7310 | | ug/L | | 99 | 87 - 115 |
| Manganese | 160 | | 400 | 557 | | ug/L | | 98 | 90 - 114 |

**Lab Sample ID: 680-191218-2 MSD**
**Matrix: Water**
**Analysis Batch: 643527**

**Client Sample ID: SHM-13-04-FAL20 MSD**
**Prep Type: Dissolved**
**Prep Batch: 642998**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 2400 | | 5000 | 7930 | | ug/L | | 111 | 87 - 115 | 8 | 20 |
| Manganese | 160 | | 400 | 526 | | ug/L | | 90 | 90 - 114 | 6 | 20 |

**Lab Sample ID: 680-191218-13 MS**
**Matrix: Water**
**Analysis Batch: 643527**

**Client Sample ID: SHM-05-41C-FAL20 MS**
**Prep Type: Dissolved**
**Prep Batch: 642998**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 14000 | | 5000 | 18400 | | ug/L | | 89 | 87 - 115 |
| Manganese | 2600 | J | 400 | 2880 | 4 | ug/L | | 74 | 90 - 114 |

**Lab Sample ID: 680-191218-13 MSD**
**Matrix: Water**
**Analysis Batch: 643527**

**Client Sample ID: SHM-05-41C-FAL20 MSD**
**Prep Type: Dissolved**
**Prep Batch: 642998**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 14000 | | 5000 | 18400 | | ug/L | | 91 | 87 - 115 | 0 | 20 |
| Manganese | 2600 | J | 400 | 2880 | 4 | ug/L | | 74 | 90 - 114 | 0 | 20 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-642997/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 643653** — **Prep Batch: 642997**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/08/20 16:13 | 11/11/20 15:43 | 1 |

**Lab Sample ID: LCS 680-642997/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 643653** — **Prep Batch: 642997**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 110 | | ug/L | | 110 | 84 - 116 |

**Lab Sample ID: 680-191218-2 MS** — **Client Sample ID: SHM-13-04-FAL20 MS**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643653** — **Prep Batch: 642997**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 260 | J | 100 | 357 | | ug/L | | 98 | 84 - 116 |

**Lab Sample ID: 680-191218-2 MSD** — **Client Sample ID: SHM-13-04-FAL20 MSD**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643653** — **Prep Batch: 642997**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 260 | J | 100 | 456 | J | ug/L | | 197 | 84 - 116 | 24 | 20 |

**Lab Sample ID: 680-191218-13 MS** — **Client Sample ID: SHM-05-41C-FAL20 MS**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643653** — **Prep Batch: 642997**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 610 | J | 100 | 755 | 4 | ug/L | | 149 | 84 - 116 |

**Lab Sample ID: 680-191218-13 MSD** — **Client Sample ID: SHM-05-41C-FAL20 MSD**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643653** — **Prep Batch: 642997**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 610 | J | 100 | 718 | 4 | ug/L | | 113 | 84 - 116 | 5 | 20 |

## Method: 9060A - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-517198/34** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517198**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/18/20 04:29 | 1 |

## Method: 9060A - Organic Carbon, Dissolved (DOC) (Continued)

**Lab Sample ID: LCS 280-517198/33** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517198**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | | | 25.0 | 24.3 | | mg/L | | 97 | 88 - 112 | | |

**Lab Sample ID: 680-191218-2 MS** — **Client Sample ID: SHM-13-04-FAL20 MS**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517198**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.93 | J | 25.0 | 25.2 | | mg/L | | 97 | 88 - 112 | | |

**Lab Sample ID: 680-191218-2 MSD** — **Client Sample ID: SHM-13-04-FAL20 MSD**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517198**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.93 | J | 25.0 | 25.5 | | mg/L | | 98 | 88 - 112 | 1 | 15 |

**Lab Sample ID: 680-191218-13 MS** — **Client Sample ID: SHM-05-41C-FAL20 MS**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517198**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 3.2 | | 25.0 | 28.1 | | mg/L | | 100 | 88 - 112 | | |

**Lab Sample ID: 680-191218-13 MSD** — **Client Sample ID: SHM-05-41C-FAL20 MSD**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517198**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 3.2 | | 25.0 | 28.2 | | mg/L | | 100 | 88 - 112 | 0 | 15 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-516826/6** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516826**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/13/20 16:19 | 1 |

**Lab Sample ID: LCS 280-516826/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516826**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 190 | | mg/L | | 95 | 89 - 109 | | |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: LCSD 280-516826/5** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516826**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 207 | | mg/L | | 103 | 89 - 109 | 9 | 10 |

**Lab Sample ID: MB 280-516966/58** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516966**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/16/20 19:13 | 1 |

**Lab Sample ID: MB 280-516966/84** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516966**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/16/20 21:52 | 1 |

**Lab Sample ID: LCS 280-516966/57** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516966**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 207 | | mg/L | | 104 | 89 - 109 | | |

**Lab Sample ID: LCS 280-516966/83** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516966**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 193 | | mg/L | | 96 | 89 - 109 | | |

**Lab Sample ID: LCSD 280-516966/5** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516966**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 210 | | mg/L | | 105 | 89 - 109 | 9 | 10 |

**Lab Sample ID: 680-191218-4 DU** — **Client Sample ID: SHM-13-07-FAL20**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516966**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 44 | | | 52.1 | | mg/L | | | | 17 | 10 |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## HPLC/IC

### Analysis Batch: 644070

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191218-1 | SHM-13-02-FAL20 | Total/NA | Water | 9056A | |
| 680-191218-2 | SHM-13-04-FAL20 | Total/NA | Water | 9056A | |
| 680-191218-3 | SHM-13-05-FAL20 | Total/NA | Water | 9056A | |
| 680-191218-4 | SHM-13-07-FAL20 | Total/NA | Water | 9056A | |
| 680-191218-5 | SHP-2016-1A-FAL20 | Total/NA | Water | 9056A | |
| 680-191218-12 | SHM-05-41B-FAL20 | Total/NA | Water | 9056A | |
| MB 680-644070/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-644070/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-644070/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| LLCS 680-644070/5 | Lab Control Sample | Total/NA | Water | 9056A | |
| 680-191218-2 MS | SHM-13-04-FAL20 MS | Total/NA | Water | 9056A | |
| 680-191218-2 MSD | SHM-13-04-FAL20 MSD | Total/NA | Water | 9056A | |

### Analysis Batch: 644081

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191218-6 | SHP-2016-1B-FAL20 | Total/NA | Water | 9056A | |
| 680-191218-7 | SHP-2016-2A-FAL20 | Total/NA | Water | 9056A | |
| 680-191218-8 | SHP-2016-2B-FAL20 | Total/NA | Water | 9056A | |
| 680-191218-9 | SHP-2016-4A-FAL20 | Total/NA | Water | 9056A | |
| 680-191218-10 | SHP-2016-4B-FAL20 | Total/NA | Water | 9056A | |
| 680-191218-11 | SHM-05-41A-FAL20 | Total/NA | Water | 9056A | |
| 680-191218-14 | EPA-PZ-2012-7A-FAL20 | Total/NA | Water | 9056A | |
| 680-191218-15 | EPA-PZ-2012-7B-FAL20 | Total/NA | Water | 9056A | |
| MB 680-644081/33 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-644081/34 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-644081/35 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-191218-7 MS | SHP-2016-2A-FAL20 | Total/NA | Water | 9056A | |
| 680-191218-7 MSD | SHP-2016-2A-FAL20 | Total/NA | Water | 9056A | |

### Analysis Batch: 644230

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191218-13 | SHM-05-41C-FAL20 | Total/NA | Water | 9056A | |
| MB 680-644230/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-644230/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-644230/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-191218-13 MS | SHM-05-41C-FAL20 MS | Total/NA | Water | 9056A | |
| 680-191218-13 MSD | SHM-05-41C-FAL20 MSD | Total/NA | Water | 9056A | |

### Analysis Batch: 644485

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191218-13 - DL | SHM-05-41C-FAL20 | Total/NA | Water | 9056A | |
| MB 680-644485/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-644485/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-644485/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-191218-13 MS - DL | SHM-05-41C-FAL20 MS | Total/NA | Water | 9056A | |
| 680-191218-13 MSD - DL | SHM-05-41C-FAL20 MSD | Total/NA | Water | 9056A | |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Metals

### Prep Batch: 642997

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191218-1 | SHM-13-02-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-2 | SHM-13-04-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-3 | SHM-13-05-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-4 | SHM-13-07-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-5 | SHP-2016-1A-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-6 | SHP-2016-1B-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-7 | SHP-2016-2A-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-8 | SHP-2016-2B-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-9 | SHP-2016-4A-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-10 | SHP-2016-4B-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-11 | SHM-05-41A-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-12 | SHM-05-41B-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-13 | SHM-05-41C-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-14 | EPA-PZ-2012-7A-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-15 | EPA-PZ-2012-7B-FAL20 | Dissolved | Water | 3005A | |
| MB 680-642997/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-642997/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191218-2 MS | SHM-13-04-FAL20 MS | Dissolved | Water | 3005A | |
| 680-191218-2 MSD | SHM-13-04-FAL20 MSD | Dissolved | Water | 3005A | |
| 680-191218-13 MS | SHM-05-41C-FAL20 MS | Dissolved | Water | 3005A | |
| 680-191218-13 MSD | SHM-05-41C-FAL20 MSD | Dissolved | Water | 3005A | |

### Prep Batch: 642998

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191218-1 | SHM-13-02-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-2 | SHM-13-04-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-3 | SHM-13-05-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-4 | SHM-13-07-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-5 | SHP-2016-1A-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-6 | SHP-2016-1B-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-7 | SHP-2016-2A-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-8 | SHP-2016-2B-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-9 | SHP-2016-4A-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-10 | SHP-2016-4B-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-11 | SHM-05-41A-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-12 | SHM-05-41B-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-13 | SHM-05-41C-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-14 | EPA-PZ-2012-7A-FAL20 | Dissolved | Water | 3005A | |
| 680-191218-15 | EPA-PZ-2012-7B-FAL20 | Dissolved | Water | 3005A | |
| MB 680-642998/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-642998/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191218-2 MS | SHM-13-04-FAL20 MS | Dissolved | Water | 3005A | |
| 680-191218-2 MSD | SHM-13-04-FAL20 MSD | Dissolved | Water | 3005A | |
| 680-191218-13 MS | SHM-05-41C-FAL20 MS | Dissolved | Water | 3005A | |
| 680-191218-13 MSD | SHM-05-41C-FAL20 MSD | Dissolved | Water | 3005A | |

### Analysis Batch: 643527

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191218-1 | SHM-13-02-FAL20 | Dissolved | Water | 6010C | 642998 |
| 680-191218-2 | SHM-13-04-FAL20 | Dissolved | Water | 6010C | 642998 |
| 680-191218-3 | SHM-13-05-FAL20 | Dissolved | Water | 6010C | 642998 |

## Metals (Continued)

### Analysis Batch: 643527 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191218-4 | SHM-13-07-FAL20 | Dissolved | Water | 6010C | 642998 |
| 680-191218-5 | SHP-2016-1A-FAL20 | Dissolved | Water | 6010C | 642998 |
| 680-191218-6 | SHP-2016-1B-FAL20 | Dissolved | Water | 6010C | 642998 |
| 680-191218-7 | SHP-2016-2A-FAL20 | Dissolved | Water | 6010C | 642998 |
| 680-191218-8 | SHP-2016-2B-FAL20 | Dissolved | Water | 6010C | 642998 |
| 680-191218-9 | SHP-2016-4A-FAL20 | Dissolved | Water | 6010C | 642998 |
| 680-191218-10 | SHP-2016-4B-FAL20 | Dissolved | Water | 6010C | 642998 |
| 680-191218-11 | SHM-05-41A-FAL20 | Dissolved | Water | 6010C | 642998 |
| 680-191218-12 | SHM-05-41B-FAL20 | Dissolved | Water | 6010C | 642998 |
| 680-191218-13 | SHM-05-41C-FAL20 | Dissolved | Water | 6010C | 642998 |
| 680-191218-14 | EPA-PZ-2012-7A-FAL20 | Dissolved | Water | 6010C | 642998 |
| 680-191218-15 | EPA-PZ-2012-7B-FAL20 | Dissolved | Water | 6010C | 642998 |
| MB 680-642998/1-A | Method Blank | Total Recoverable | Water | 6010C | 642998 |
| LCS 680-642998/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 642998 |
| 680-191218-2 MS | SHM-13-04-FAL20 MS | Dissolved | Water | 6010C | 642998 |
| 680-191218-2 MSD | SHM-13-04-FAL20 MSD | Dissolved | Water | 6010C | 642998 |
| 680-191218-13 MS | SHM-05-41C-FAL20 MS | Dissolved | Water | 6010C | 642998 |
| 680-191218-13 MSD | SHM-05-41C-FAL20 MSD | Dissolved | Water | 6010C | 642998 |

### Analysis Batch: 643653

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191218-1 | SHM-13-02-FAL20 | Dissolved | Water | 6020A | 642997 |
| 680-191218-2 | SHM-13-04-FAL20 | Dissolved | Water | 6020A | 642997 |
| 680-191218-3 | SHM-13-05-FAL20 | Dissolved | Water | 6020A | 642997 |
| 680-191218-4 | SHM-13-07-FAL20 | Dissolved | Water | 6020A | 642997 |
| 680-191218-5 | SHP-2016-1A-FAL20 | Dissolved | Water | 6020A | 642997 |
| 680-191218-6 | SHP-2016-1B-FAL20 | Dissolved | Water | 6020A | 642997 |
| 680-191218-7 | SHP-2016-2A-FAL20 | Dissolved | Water | 6020A | 642997 |
| 680-191218-8 | SHP-2016-2B-FAL20 | Dissolved | Water | 6020A | 642997 |
| 680-191218-9 | SHP-2016-4A-FAL20 | Dissolved | Water | 6020A | 642997 |
| 680-191218-10 | SHP-2016-4B-FAL20 | Dissolved | Water | 6020A | 642997 |
| 680-191218-11 | SHM-05-41A-FAL20 | Dissolved | Water | 6020A | 642997 |
| 680-191218-12 | SHM-05-41B-FAL20 | Dissolved | Water | 6020A | 642997 |
| 680-191218-13 | SHM-05-41C-FAL20 | Dissolved | Water | 6020A | 642997 |
| 680-191218-14 | EPA-PZ-2012-7A-FAL20 | Dissolved | Water | 6020A | 642997 |
| 680-191218-15 | EPA-PZ-2012-7B-FAL20 | Dissolved | Water | 6020A | 642997 |
| MB 680-642997/1-A | Method Blank | Total Recoverable | Water | 6020A | 642997 |
| LCS 680-642997/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 642997 |
| 680-191218-2 MS | SHM-13-04-FAL20 MS | Dissolved | Water | 6020A | 642997 |
| 680-191218-2 MSD | SHM-13-04-FAL20 MSD | Dissolved | Water | 6020A | 642997 |
| 680-191218-13 MS | SHM-05-41C-FAL20 MS | Dissolved | Water | 6020A | 642997 |
| 680-191218-13 MSD | SHM-05-41C-FAL20 MSD | Dissolved | Water | 6020A | 642997 |

## General Chemistry

### Analysis Batch: 516826

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191218-1 | SHM-13-02-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191218-2 | SHM-13-04-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-516826/6 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-516826/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |

## General Chemistry (Continued)

### Analysis Batch: 516826 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCSD 280-516826/5 | Lab Control Sample Dup | Total/NA | Water | SM 2320B | |

### Analysis Batch: 516966

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191218-3 | SHM-13-05-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191218-4 | SHM-13-07-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191218-5 | SHP-2016-1A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191218-6 | SHP-2016-1B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191218-7 | SHP-2016-2A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191218-8 | SHP-2016-2B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191218-9 | SHP-2016-4A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191218-10 | SHP-2016-4B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191218-11 | SHM-05-41A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191218-12 | SHM-05-41B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191218-13 | SHM-05-41C-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191218-14 | EPA-PZ-2012-7A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191218-15 | EPA-PZ-2012-7B-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-516966/58 | Method Blank | Total/NA | Water | SM 2320B | |
| MB 280-516966/84 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-516966/57 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| LCS 280-516966/83 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| LCSD 280-516966/5 | Lab Control Sample Dup | Total/NA | Water | SM 2320B | |
| 680-191218-4 DU | SHM-13-07-FAL20 | Total/NA | Water | SM 2320B | |

### Analysis Batch: 517198

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191218-1 | SHM-13-02-FAL20 | Dissolved | Water | 9060A | |
| 680-191218-2 | SHM-13-04-FAL20 | Dissolved | Water | 9060A | |
| 680-191218-3 | SHM-13-05-FAL20 | Dissolved | Water | 9060A | |
| 680-191218-4 | SHM-13-07-FAL20 | Dissolved | Water | 9060A | |
| 680-191218-5 | SHP-2016-1A-FAL20 | Dissolved | Water | 9060A | |
| 680-191218-6 | SHP-2016-1B-FAL20 | Dissolved | Water | 9060A | |
| 680-191218-7 | SHP-2016-2A-FAL20 | Dissolved | Water | 9060A | |
| 680-191218-8 | SHP-2016-2B-FAL20 | Dissolved | Water | 9060A | |
| 680-191218-9 | SHP-2016-4A-FAL20 | Dissolved | Water | 9060A | |
| 680-191218-10 | SHP-2016-4B-FAL20 | Dissolved | Water | 9060A | |
| 680-191218-11 | SHM-05-41A-FAL20 | Dissolved | Water | 9060A | |
| 680-191218-12 | SHM-05-41B-FAL20 | Dissolved | Water | 9060A | |
| 680-191218-13 | SHM-05-41C-FAL20 | Dissolved | Water | 9060A | |
| 680-191218-14 | EPA-PZ-2012-7A-FAL20 | Dissolved | Water | 9060A | |
| 680-191218-15 | EPA-PZ-2012-7B-FAL20 | Dissolved | Water | 9060A | |
| MB 280-517198/34 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-517198/33 | Lab Control Sample | Dissolved | Water | 9060A | |
| 680-191218-2 MS | SHM-13-04-FAL20 MS | Dissolved | Water | 9060A | |
| 680-191218-2 MSD | SHM-13-04-FAL20 MSD | Dissolved | Water | 9060A | |
| 680-191218-13 MS | SHM-05-41C-FAL20 MS | Dissolved | Water | 9060A | |
| 680-191218-13 MSD | SHM-05-41C-FAL20 MSD | Dissolved | Water | 9060A | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Client Sample ID: SHM-13-02-FAL20

**Lab Sample ID: 680-191218-1**

**Date Collected: 11/05/20 15:00**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644070 | 11/15/20 00:54 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 21:28 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 16:20 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 06:27 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516826 | 11/13/20 18:26 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-13-04-FAL20

**Lab Sample ID: 680-191218-2**

**Date Collected: 11/06/20 10:10**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644070 | 11/14/20 23:11 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 20:41 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 15:49 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 05:04 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516826 | 11/13/20 18:31 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-13-05-FAL20

**Lab Sample ID: 680-191218-3**

**Date Collected: 11/06/20 09:00**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644070 | 11/15/20 01:07 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 21:32 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 16:23 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Client Sample ID: SHM-13-05-FAL20

**Lab Sample ID: 680-191218-3**

**Date Collected: 11/06/20 09:00**
**Date Received: 11/07/20 09:55**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 06:43 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 21:29 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-13-07-FAL20

**Lab Sample ID: 680-191218-4**

**Date Collected: 11/05/20 16:00**
**Date Received: 11/07/20 09:55**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644070 | 11/15/20 01:20 | EKB | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 22:09 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 16:49 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 07:00 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 21:56 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHP-2016-1A-FAL20

**Lab Sample ID: 680-191218-5**

**Date Collected: 11/05/20 15:40**
**Date Received: 11/07/20 09:55**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644070 | 11/15/20 01:33 | EKB | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 22:32 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 17:04 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 07:17 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 22:06 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Client Sample ID: SHP-2016-1B-FAL20

**Lab Sample ID: 680-191218-6**

**Date Collected: 11/05/20 16:30**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644081 | 11/15/20 03:16 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 21:41 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 16:30 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 07:36 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 22:11 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHP-2016-2A-FAL20

**Lab Sample ID: 680-191218-7**

**Date Collected: 11/06/20 12:30**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644081 | 11/15/20 02:37 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 22:05 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 16:46 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 07:53 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 22:16 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHP-2016-2B-FAL20

**Lab Sample ID: 680-191218-8**

**Date Collected: 11/06/20 14:00**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644081 | 11/15/20 03:29 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 21:46 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 16:33 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Client Sample ID: SHP-2016-2B-FAL20

**Lab Sample ID: 680-191218-8**

**Date Collected: 11/06/20 14:00**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 08:13 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 22:19 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHP-2016-4A-FAL20

**Lab Sample ID: 680-191218-9**

**Date Collected: 11/06/20 10:00**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644081 | 11/15/20 03:42 | EKB | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 21:55 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 16:39 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 08:28 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 22:25 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHP-2016-4B-FAL20

**Lab Sample ID: 680-191218-10**

**Date Collected: 11/06/20 11:20**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644081 | 11/15/20 03:55 | EKB | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 22:28 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 17:01 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 08:47 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 22:29 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Client Sample ID: SHM-05-41A-FAL20

**Lab Sample ID: 680-191218-11**

**Date Collected: 11/06/20 13:50**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644081 | 11/15/20 04:08 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 21:51 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 16:36 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 10:24 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 22:34 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-05-41B-FAL20

**Lab Sample ID: 680-191218-12**

**Date Collected: 11/06/20 14:55**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 5 | 5 mL | 5 mL | 644070 | 11/14/20 21:15 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 21:37 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 16:27 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 10:45 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 22:39 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-05-41C-FAL20

**Lab Sample ID: 680-191218-13**

**Date Collected: 11/06/20 12:10**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644230 | 11/16/20 17:16 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Total/NA | Analysis | 9056A | DL | 10 | 5 mL | 5 mL | 644485 | 11/18/20 09:09 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 21:04 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Client Sample ID: SHM-05-41C-FAL20

**Lab Sample ID: 680-191218-13**

**Date Collected: 11/06/20 12:10**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 16:05 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 09:06 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 22:59 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: EPA-PZ-2012-7A-FAL20

**Lab Sample ID: 680-191218-14**

**Date Collected: 11/06/20 09:45**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644081 | 11/15/20 04:21 | EKB | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 22:00 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 16:42 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 11:04 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 23:03 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: EPA-PZ-2012-7B-FAL20

**Lab Sample ID: 680-191218-15**

**Date Collected: 11/06/20 10:50**
**Matrix: Water**
**Date Received: 11/07/20 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644081 | 11/15/20 04:34 | EKB | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642998 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 22:23 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642997 | 11/08/20 16:13 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643653 | 11/11/20 16:58 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 11:20 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 23:08 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

## Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| ANAB | Dept. of Defense ELAP | L2463 | 09-22-22 |

## Laboratory: Eurofins TestAmerica, Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| A2LA | Dept. of Defense ELAP | 2907.01 | 10-31-21 |

# Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191218-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060A | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | TAL SAV |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-191218 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 69 | SHM-10-05A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-05A | N1 | 50.00 | 60.00 | | |
| 70 | SHM-10-06-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06 | N1 | 69.50 | 79.50 | | |
| 71 | SHM-10-06A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06A | N1 | 77.00 | 87.00 | | |
| 72 | SHM-10-07-FAL20 | WG | | | | X | X | X | X | X | SHM-10-07 | N1 | 40.00 | 50.00 | | |
| 73 | SHM-10-08-FAL20 | WG | | | | X | X | X | X | X | SHM-10-08 | N1 | 46.00 | 56.00 | | |
| 74 | SHM-10-10-FAL20 | WG | | | | X | X | X | X | X | SHM-10-10 | N1 | 56.00 | 66.00 | | |
| 75 | SHM-10-11-FAL20 | WG | | | | X | X | X | X | X | SHM-10-11 | N1 | 50.00 | 60.00 | | |
| 76 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | MS1 | 45.00 | 55.00 | | |
| 77 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | N1 | 45.00 | 55.00 | | |
| 78 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | SD1 | 45.00 | 55.00 | | |
| 79 | SHM-10-13-FAL20 | WG | | | | X | X | X | X | X | SHM-10-13 | N1 | 60.00 | 70.00 | | |
| 80 | SHM-10-14-FAL20 | WG | | | | X | X | X | X | X | SHM-10-14 | N1 | 60.00 | 80.00 | | |
| 81 | SHM-10-15-FAL20 | WG | | | | X | X | X | X | X | SHM-10-15 | N1 | 45.00 | 55.00 | | |
| 82 | SHM-10-16-FAL20 | WG | | | | X | X | X | X | X | SHM-10-16 | N1 | 75.00 | 85.00 | | |
| 83 | SHM-11-02-FAL20 | WG | | | | X | X | X | X | X | SHM-11-02 | N1 | 52.00 | 66.00 | | |
| 84 | SHM-11-06-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | N1 | 25.00 | 35.00 | | |
| 85 | SHM-13-01-FAL20 | WG | | | | X | X | X | X | X | SHM-13-01 | N1 | 39.00 | 49.00 | | |
| 86 | SHM-13-02-FAL20 | WG | 11-5-20 | 1500 | CR | X | X | X | X | X | SHM-13-02 | N1 | 60.00 | 70.00 | | |

**Relinquished by:**
**Date**
**Time**
Received by:
SHL_eCOC

Diane Chipgrae 11-6-20 1600
[signature] 11/6/20 ~~760~~ 1700

**Date**
**Time**
**Shipping Date:**
Received by Laboratory:
Condition:

[signature] ETA 11/6/20 1600

1.5/1.8 3.3/3.6 2.0/2.3
[signature] TA. 11-7-20 955

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 87 | SHM-13-03-FAL20 | WG | | | | X | X | X | X | X | SHM-13-03 | N1 | 42.00 | 52.00 | | |
| 88 | SHM-13-04-FAL20 | WG | 11-6-20 | 1010 | NB | X | X | X | X | X | SHM-13-04 | MS1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | 11-6-20 | 1010 | NB | X | X | X | X | X | SHM-13-04 | N1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | 11-6-20 | 1010 | NB | X | X | X | X | X | SHM-13-04 | SD1 | 20.00 | 30.00 | | |
| 89 | SHM-13-05-FAL20 | WG | 11-6-20 | 0900 | NB | X | X | X | X | X | SHM-13-05 | N1 | 75.00 | 85.00 | | |
| 90 | SHM-13-06-FAL20 | WG | | | | X | X | X | X | X | SHM-13-06 | N1 | 36.00 | 46.00 | | |
| 91 | SHM-13-07-FAL20 | WG | 11-5-20 | 1600 | CR | X | X | X | X | X | SHM-13-07 | N1 | 27.00 | 37.00 | | |
| 92 | SHM-13-08-FAL20 | WG | | | | X | X | X | X | X | SHM-13-08 | N1 | 55.00 | 65.00 | | |
| 93 | SHM-13-14D-FAL20 | WG | | | | X | X | X | X | X | SHM-13-14D | N1 | 45.00 | 55.00 | | |
| 94 | SHM-13-14S-FAL20 | WG | | | | X | X | X | X | X | SHM-13-14S | N1 | 5.00 | 15.00 | | |
| 95 | SHM-13-15-FAL20 | WG | | | | X | X | X | X | X | SHM-13-15 | N1 | 50.00 | 60.00 | | |
| 96 | SHM-93-10D-FAL20 | WG | | | | X | X | X | X | X | SHM-93-10D | N1 | 48.70 | 58.70 | | |
| 97 | SHM-93-18B-FAL20 | WG | | | | X | X | X | X | X | SHM-93-18B | N1 | 78.50 | 88.50 | | |
| 98 | SHM-93-22B-FAL20 | WG | | | | X | X | X | X | X | SHM-93-22B | N1 | 82.30 | 92.30 | | |
| 99 | SHM-93-22C-FAL20 | WG | | | | X | X | X | X | X | SHM-93-22C | N1 | 124.30 | 134.30 | | |
| 100 | SHM-93-24A-FAL20 | WG | | | | X | X | X | X | X | SHM-93-24A | N1 | 13.20 | 23.20 | | |
| 101 | SHM-96-5B-FAL20 | WG | | | | X | X | X | X | X | SHM-96-5B | N1 | 80.00 | 90.00 | | |
| 102 | SHM-96-5C-FAL20 | WG | | | | X | X | X | X | X | SHM-96-5C | N1 | 50.00 | 60.00 | | |

**Relinquished by:** [signature]
**Date** 11-6-20
**Time** 1600
Received by: [signature] 11/6/20 1700
SHL_eCOC

**Date**
**Time**
**Shipping Date:** [signature] 11/6/20 1600 ETA
Received by Laboratory: [signature] TA
Condition: 11.7.20 955

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Analytical Test Method** | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | | | | | | |
| 103 | SHM-99-31A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-99-31A | N1 | 4.00 | 14.00 | | |
| 104 | SHM-99-31B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-99-31B | N1 | 50.00 | 60.00 | | |
| 105 | SHM-99-31C-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-99-31C | N1 | 68.00 | 78.00 | | |
| 106 | SHM-99-32X-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-99-32X | N1 | 72.00 | 82.00 | | |
| 107 | SHP-01-36X-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-01-36X | N1 | 3.00 | 8.00 | | |
| 108 | SHP-01-37X-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-01-37X | N1 | 1.00 | 6.00 | | |
| 109 | SHP-01-38A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-01-38A | N1 | 1.50 | 6.50 | | |
| 110 | SHP-2016-06A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-06A | N1 | 81.00 | 86.00 | | |
| 111 | SHP-2016-06B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-06B | N1 | 102.00 | 112.00 | | |
| 112 | SHP-2016-06C-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-06C | N1 | 123.00 | 133.00 | | |
| 113 | SHP-2016-07A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-07A | N1 | 22.00 | 32.00 | | |
| 114 | SHP-2016-07B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-07B | N1 | 70.00 | 80.00 | | |
| 115 | SHP-2016-1A-FAL20 | WG | 11-5-20 | 1540 | DC | X | X | X | X | X | | | | | | SHP-2016-1A | N1 | 13.00 | 23.00 | | |
| 116 | SHP-2016-1B-FAL20 | WG | 11-5-20 | 1630 | DC | X | X | X | X | X | | | | | | SHP-2016-1B | N1 | 75.00 | 85.00 | | |
| 117 | SHP-2016-2A-FAL20 | WG | 11-6-20 | 1230 | CR | X | X | X | X | X | | | | | | SHP-2016-2A | N1 | 20.00 | 25.00 | | |
| 118 | SHP-2016-2B-FAL20 | WG | 11-6-20 | 1400 | CR | X | X | X | X | X | | | | | | SHP-2016-2B | N1 | 80.00 | 85.00 | | |
| 119 | SHP-2016-3A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-3A | N1 | 20.00 | 25.00 | | |
| 120 | SHP-2016-3B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-3B | N1 | 80.00 | 85.00 | | |

**Relinquished by:** Diane Chupque
**Date** 11-6-20
**Time** 1600
Received by: [illegible] 11/6/20 1600
SHL_eCOC

**Date**
**Time**
**Shipping Date:** ETA 11/6/20 1600
Received by Laboratory: [illegible] TA 11-7-20 955
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | | | | | | |
| 121 | SHP-2016-4A-FAL20 | WG | 11-6-20 | 1000 | CR | X | X | X | X | X | | | | | | SHP-2016-4A | N1 | 25.00 | 30.00 | | |
| 122 | SHP-2016-4B-FAL20 | WG | 11-6-20 | 1120 | CR | X | X | X | X | X | | | | | | SHP-2016-4B | N1 | 85.00 | 90.00 | | |
| 123 | SHP-2016-5A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-5A | N1 | 25.00 | 30.00 | | |
| 124 | SHP-2016-5B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-5B | N1 | 85.00 | 90.00 | | |
| 125 | SHP-99-29X-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-99-29X | N1 | 19.00 | 29.00 | | |

**Turnaround Time: NA**

**Relinquished by:** [illegible]
**Date** 11-6-20
**Time** 1600
Received by: [illegible]
SHL_eCOC
11/6/20 1700

**Date** 11/6/20
**Time** 1600
**Shipping Date:** ETA
Received by Laboratory: [illegible] 11-7-20
Condition: 955 7A

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston
#215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 53 | SHL-DUP10-FAL20 | WG | | | | X | X | X | X | X | SHM-05-40X | FD1 | 32.00 | 34.00 | | |
| 54 | SHM-05-39A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-39A | N1 | 37.00 | 39.00 | | |
| 55 | SHM-05-39B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-39B | N1 | 66.00 | 68.00 | | |
| 56 | SHM-05-40X-FAL20 | WG | | | | X | X | X | X | X | SHM-05-40X | N1 | 32.00 | 34.00 | | |
| 57 | SHM-05-41A-FAL20 | WG | 11-6-20 | 1350 | DC | X | X | X | X | X | SHM-05-41A | N1 | 42.00 | 44.00 | | |
| 58 | SHM-05-41B-FAL20 | WG | 11-6-20 | 1455 | DC | X | X | X | X | X | SHM-05-41B | N1 | 62.00 | 64.00 | | |
| 59 | SHM-05-41C-FAL20 | WG | 11-6-20 | 1210 | DC | X | X | X | X | X | SHM-05-41C | MS1 | 88.00 | 93.00 | | |
| 60 | SHM-05-41C-FAL20 | WG | 11-6-20 | 1210 | DC | X | X | X | X | X | SHM-05-41C | N1 | 88.00 | 93.00 | | |
| 61 | SHM-05-41C-FAL20 | WG | 11-6-20 | 1210 | DC | X | X | X | X | X | SHM-05-41C | SD1 | 88.00 | 93.00 | | |
| 62 | SHM-05-42A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-42A | N1 | 40.00 | 42.00 | | |
| 63 | SHM-05-42B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-42B | N1 | 70.00 | 72.00 | | |
| 64 | SHM-07-03-FAL20 | WG | | | | X | X | X | X | X | SHM-07-03 | N1 | 25.00 | 35.00 | | |
| 65 | SHM-07-05X-FAL20 | WG | | | | X | X | X | X | X | SHM-07-05X | N1 | 55.00 | 65.00 | | |
| 66 | SHM-10-02-FAL20 | WG | | | | X | X | X | X | X | SHM-10-02 | N1 | 53.00 | 63.00 | | |
| 67 | SHM-10-03-FAL20 | WG | | | | X | X | X | X | X | SHM-10-03 | N1 | 58.50 | 68.50 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | MS1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | N1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | SD1 | 55.00 | 65.00 | | |

**Relinquished by:** Drane Clipper 1600
**Date** 11-6-20
**Time**
Received by: [signature] 11/6/20 1600
SHL_eCOC

**Date**
**Time**
**Shipping Date:** [signature] ETA 11/6/20 1600
Received by Laboratory: [signature] TM 11-7-20 955
Condition:



11/20/2020

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | | | | | | |
| 1 | EPA-PZ-2012-1A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-1A | N1 | 23.70 | 28.70 | | |
| 2 | EPA-PZ-2012-1B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-1B | N1 | 73.56 | 78.56 | | |
| 3 | EPA-PZ-2012-2A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-2A | N1 | 18.14 | 23.14 | | |
| 4 | EPA-PZ-2012-2B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-2B | N1 | 73.16 | 78.16 | | |
| 5 | EPA-PZ-2012-3A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-3A | N1 | 19.09 | 24.09 | | |
| 6 | EPA-PZ-2012-3B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-3B | N1 | 68.70 | 73.70 | | |
| 7 | EPA-PZ-2012-4A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-4A | N1 | 19.56 | 24.56 | | |
| 8 | EPA-PZ-2012-4B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-4B | N1 | 79.50 | 84.50 | | |
| 9 | EPA-PZ-2012-5A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-5A | N1 | 17.95 | 22.95 | | |
| 10 | EPA-PZ-2012-5B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-5B | N1 | 68.46 | 73.46 | | |
| 11 | EPA-PZ-2012-6A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-6A | N1 | 24.19 | 29.19 | | |
| 12 | EPA-PZ-2012-6B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-6B | N1 | 74.23 | 79.23 | | |
| 13 | EPA-PZ-2012-7A-FAL20 | WG | 11-6-20 | 945 | DC | X | X | X | X | X | | | | | | EPA-PZ-2012-7A | N1 | 23.87 | 28.87 | | |
| 14 | EPA-PZ-2012-7B-FAL20 | WG | 11-6-20 | 1050 | DC | X | X | X | X | X | | | | | | EPA-PZ-2012-7B | N1 | 58.82 | 63.82 | | |
| 15 | EW-01-FAL20 | WG | | | | X | X | X | X | X | | | | | | EW-01 | N1 | 60.00 | 85.00 | | |
| 16 | EW-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | EW-04 | N1 | 70.00 | 95.00 | | |
| 17 | N5-P1-FAL20 | WG | | | | X | X | X | X | X | | | | | | N5-P1 | N1 | 95.50 | 97.50 | | |
| 18 | PZ-12-01-FAL20 | WG | | | | X | X | X | X | X | | | | | | PZ-12-01 | N1 | 24.00 | 34.00 | | |

**Relinquished by:** Dave Chupgne
**Date** 11-6-20
**Time** 1600
Received by: [signature] 11/6/20 1700
SHL_eCOC

**Date**
**Time**
**Shipping Date:** [signature] ETA 11/6/20 1600
Received by Laboratory: [signature] TA 11-7-20 955
Condition:

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-632450.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 3 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-191218-1 |
| Address: 4955 Yarrow Street, | Due Date Requested: 11/18/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SHM-13-02-FAL20 (680-191218-1) | 11/5/20 | 15:00 Eastern | | Water | | | X | X | 2 | |
| SHM-13-04-FAL20 (680-191218-2) | 11/6/20 | 10:10 Eastern | | Water | | | X | X | 2 | |
| SHM-13-04-FAL20 MS (680-191218-2MS) | 11/6/20 | 10:10 Eastern | MS | Water | | | X | X | 2 | |
| SHM-13-04-FAL20 MSD (680-191218-2MSD) | 11/6/20 | 10:10 Eastern | MSD | Water | | | X | X | 2 | |
| SHM-13-05-FAL20 (680-191218-3) | 11/6/20 | 09:00 Eastern | | Water | | | X | X | 2 | |
| SHM-13-07-FAL20 (680-191218-4) | 11/5/20 | 16:00 Eastern | | Water | | | X | X | 2 | |
| SHP-2016-1A-FAL20 (680-191218-5) | 11/5/20 | 15:40 Eastern | | Water | | | X | X | 2 | |
| SHP-2016-1B-FAL20 (680-191218-6) | 11/5/20 | 16:30 Eastern | | Water | | | X | X | 2 | |
| SHP-2016-2A-FAL20 (680-191218-7) | 11/6/20 | 12:30 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| Possible Hazard Identification | Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month) |
|---|---|
| Unconfirmed | ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| [signature] | 11-09-20 | 1618 | [signature] | 11/10/20 0940 | ETA-Rus |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: 1334407 | Cooler Temperature(s) °C and Other Remarks: 0.7 IR#11-0.3 |
|---|---|---|

Ver: 01/16/2019

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-632450.2 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 2 of 3 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-191218-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/18/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SHP-2016-2B-FAL20 (680-191218-8) | 11/6/20 | 14:00 Eastern | | Water | | | X | X | 2 | |
| SHP-2016-4A-FAL20 (680-191218-9) | 11/6/20 | 10:00 Eastern | | Water | | | X | X | 2 | |
| SHP-2016-4B-FAL20 (680-191218-10) | 11/6/20 | 11:20 Eastern | | Water | | | X | X | 2 | |
| SHM-05-41A-FAL20 (680-191218-11) | 11/6/20 | 13:50 Eastern | | Water | | | X | X | 2 | |
| SHM-05-41B-FAL20 (680-191218-12) | 11/6/20 | 14:55 Eastern | | Water | | | X | X | 2 | |
| SHM-05-41C-FAL20 (680-191218-13) | 11/6/20 | 12:10 Eastern | | Water | | | X | X | 2 | |
| SHM-05-41C-FAL20 MS (680-191218-13MS) | 11/6/20 | 12:10 Eastern | MS | Water | | | X | X | 2 | |
| SHM-05-41C-FAL20 MSD (680-191218-13MSD) | 11/6/20 | 12:10 Eastern | MSD | Water | | | X | X | 2 | |
| EPA-PZ-2012-7A-FAL20 (680-191218-14) | 11/6/20 | 09:45 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | | | |
|---|---|---|---|---|---|
| Empty Kit Relinquished by: | Date: | | Time: | Method of Shipment: | |
| Relinquished by: [signature] | Date/Time: 11-09-20 | Company 1618 | Received by: [signature] | Date/Time: 11/10/20 0940 | Company ETA-Rec |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | | Cooler Temperature(s) °C and Other Remarks: | | |

Ver: 01/16/2019

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-632450.3 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 3 of 3 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-191218-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/18/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| EPA-PZ-2012-7B-FAL20 (680-191218-15) | 11/6/20 | 10:50 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | | | |
|---|---|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
| Relinquished by: [signature] | Date/Time: 11-09-20 | Company: 1618 | Received by: [signature] | Date/Time: 11/10/20 0940 | Company: ETA-Rcv |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | | Cooler Temperature(s) °C and Other Remarks: | | |

Ver: 01/16/2019

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191218-1

**Login Number: 191218**
**List Number: 1**
**Creator: Sims, Robert D**

**List Source: Eurofins TestAmerica, Savannah**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191218-1

**Login Number: 191218**
**List Number: 2**
**Creator: Pottruff, Reed W**

**List Source: Eurofins TestAmerica, Denver**
**List Creation: 11/10/20 10:20 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | N/A | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

eurofins | Environment Testing America

# ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-191327-1
Client Project/Site: Fort Devens - LTM

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

*Authorized for release by:*
*11/24/2020 10:49:14 AM*

Kathryn Smith, Client Service Manager
(912)250-0275
Kathy.Smith@Eurofinset.com

LINKS

Review your project results through TotalAccess

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Visit us at: www.eurofinsus.com/Env

*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

# Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

# Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 680-191327-1 | SHL-10-FAL20 | Water | 11/09/20 12:00 | 11/11/20 09:30 | |
| 680-191327-2 | SHL-RB1-FAL20 | Water | 11/09/20 13:00 | 11/11/20 09:30 | |
| 680-191327-3 | SHL-3-FAL20 | Water | 11/09/20 15:25 | 11/11/20 09:30 | |
| 680-191327-4 | SHL-5-FAL20 | Water | 11/09/20 15:45 | 11/11/20 09:30 | |
| 680-191327-5 | SHM-05-42A-FAL20 | Water | 11/09/20 13:10 | 11/11/20 09:30 | |
| 680-191327-6 | SHM-05-42B-FAL20 | Water | 11/09/20 14:15 | 11/11/20 09:30 | |
| 680-191327-7 | SHM-10-10-FAL20 | Water | 11/09/20 13:10 | 11/11/20 09:30 | |
| 680-191327-8 | SHM-13-01-FAL20 | Water | 11/09/20 11:05 | 11/11/20 09:30 | |
| 680-191327-9 | SHM-13-06-FAL20 | Water | 11/09/20 15:20 | 11/11/20 09:30 | |
| 680-191327-10 | SHP-2016-5A-FAL20 | Water | 11/09/20 10:00 | 11/11/20 09:30 | |
| 680-191327-11 | SHP-2016-5B-FAL20 | Water | 11/09/20 11:10 | 11/11/20 09:30 | |

## Job ID: 680-191327-1

**Laboratory: Eurofins TestAmerica, Savannah**

**Narrative**

# CASE NARRATIVE
# Client: Seres Engineering & Services LLC
# Project: Fort Devens - LTM

## Report Number: 680-191327-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 11/11/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.5º C and 1.6º C.

**METALS (ICP) - DISSOLVED**
Samples SHL-10-FAL20 (680-191327-1), SHL-RB1-FAL20 (680-191327-2), SHL-3-FAL20 (680-191327-3), SHL-5-FAL20 (680-191327-4), SHM-05-42A-FAL20 (680-191327-5), SHM-05-42B-FAL20 (680-191327-6), SHM-10-10-FAL20 (680-191327-7), SHM-13-01-FAL20 (680-191327-8), SHM-13-06-FAL20 (680-191327-9), SHP-2016-5A-FAL20 (680-191327-10) and SHP-2016-5B-FAL20 (680-191327-11) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/12/2020 and analyzed on 11/12/2020 and 11/14/2020.

Manganese was detected in method blank MB 680-643664/1-A at a level exceeding the reporting limit. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Manganese was detected in method blank MB 680-643718/1-A at a level exceeding the reporting limit. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Manganese recovered high for the MSD of sample SHM-13-01-FAL20MSD (680-191327-8) in batch 680-644236. Manganese exceeded the RPD limit.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples SHL-10-FAL20 (680-191327-1), SHL-RB1-FAL20 (680-191327-2), SHL-3-FAL20 (680-191327-3), SHL-5-FAL20 (680-191327-4), SHM-05-42A-FAL20 (680-191327-5), SHM-05-42B-FAL20 (680-191327-6), SHM-10-10-FAL20 (680-191327-7), SHM-13-01-FAL20 (680-191327-8), SHM-13-06-FAL20 (680-191327-9), SHP-2016-5A-FAL20 (680-191327-10) and SHP-2016-5B-FAL20 (680-191327-11) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared and analyzed on 11/12/2020.

Arsenic recovered low for the MS of sample SHM-13-01-FAL20MS (680-191327-8) in batch 680-643840.

Arsenic recovered high for the MSD of sample SHM-13-01-FAL20MSD (680-191327-8) in batch 680-643840. Arsenic exceeded the RPD limit.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples SHL-10-FAL20 (680-191327-1), SHL-RB1-FAL20 (680-191327-2), SHL-3-FAL20 (680-191327-3), SHL-5-FAL20 (680-191327-4), SHM-05-42A-FAL20 (680-191327-5), SHM-05-42B-FAL20 (680-191327-6), SHM-10-10-FAL20 (680-191327-7), SHM-13-01-FAL20 (680-191327-8), SHM-13-06-FAL20 (680-191327-9), SHP-2016-5A-FAL20 (680-191327-10) and SHP-2016-5B-FAL20 (680-191327-11) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 11/17/2020.

## Job ID: 680-191327-1 (Continued)

### Laboratory: Eurofins TestAmerica, Savannah (Continued)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**

Samples SHL-10-FAL20 (680-191327-1), SHL-RB1-FAL20 (680-191327-2), SHL-3-FAL20 (680-191327-3), SHL-5-FAL20 (680-191327-4), SHM-05-42A-FAL20 (680-191327-5), SHM-05-42B-FAL20 (680-191327-6), SHM-10-10-FAL20 (680-191327-7), SHM-13-01-FAL20 (680-191327-8), SHM-13-06-FAL20 (680-191327-9), SHP-2016-5A-FAL20 (680-191327-10) and SHP-2016-5B-FAL20 (680-191327-11) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 11/17/2020.

Sample SHM-13-06-FAL20 (680-191327-9)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL ORGANIC CARBON (TOC)**

Samples SHL-10-FAL20 (680-191327-1), SHL-RB1-FAL20 (680-191327-2), SHL-3-FAL20 (680-191327-3), SHL-5-FAL20 (680-191327-4), SHM-05-42A-FAL20 (680-191327-5), SHM-05-42B-FAL20 (680-191327-6), SHM-10-10-FAL20 (680-191327-7), SHM-13-01-FAL20 (680-191327-8), SHM-13-06-FAL20 (680-191327-9), SHP-2016-5A-FAL20 (680-191327-10) and SHP-2016-5B-FAL20 (680-191327-11) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 11/20/2020.

Dissolved Organic Carbon was detected in method blank MB 280-517641/35 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Client Sample ID: SHL-10-FAL20

**Lab Sample ID: 680-191327-1**
**Date Collected: 11/09/20 12:00**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **1.1** | | 0.50 | 0.20 | mg/L | | | 11/17/20 17:00 | 1 |
| **Sulfate** | **4.0** | | 1.0 | 0.40 | mg/L | | | 11/17/20 17:00 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/12/20 10:06 | 11/12/20 23:48 | 1 |
| **Manganese** | **23** | **B** | 10 | 1.0 | ug/L | | 11/12/20 10:06 | 11/12/20 23:48 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/12/20 10:06 | 11/12/20 14:57 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Alkalinity** | **20** | | 10 | 3.1 | mg/L | | | 11/17/20 18:33 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Dissolved Organic Carbon** | **1.7** | | 1.0 | 0.35 | mg/L | | | 11/20/20 05:06 | 1 |

## Client Sample ID: SHL-RB1-FAL20

**Lab Sample ID: 680-191327-2**
**Date Collected: 11/09/20 13:00**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/17/20 17:38 | 1 |
| Sulfate | 0.40 | U M | 1.0 | 0.40 | mg/L | | | 11/17/20 17:38 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/12/20 10:26 | 11/14/20 01:17 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/12/20 10:26 | 11/14/20 01:17 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/12/20 10:26 | 11/12/20 15:35 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/17/20 18:38 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Dissolved Organic Carbon** | **0.59** | **J** | 1.0 | 0.35 | mg/L | | | 11/20/20 05:26 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Client Sample ID: SHL-3-FAL20

**Lab Sample ID: 680-191327-3**
**Date Collected: 11/09/20 15:25**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.65 | | 0.50 | 0.20 | mg/L | | | 11/17/20 17:51 | 1 |
| Sulfate | 6.3 | M | 1.0 | 0.40 | mg/L | | | 11/17/20 17:51 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/12/20 10:26 | 11/14/20 01:22 | 1 |
| Manganese | 9.1 | J | 10 | 1.0 | ug/L | | 11/12/20 10:26 | 11/14/20 01:22 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/12/20 10:26 | 11/12/20 15:38 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 61 | | 10 | 3.1 | mg/L | | | 11/17/20 18:43 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.6 | | 1.0 | 0.35 | mg/L | | | 11/20/20 05:49 | 1 |

## Client Sample ID: SHL-5-FAL20

**Lab Sample ID: 680-191327-4**
**Date Collected: 11/09/20 15:45**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 13 | | 0.50 | 0.20 | mg/L | | | 11/17/20 18:04 | 1 |
| Sulfate | 0.40 | U M | 1.0 | 0.40 | mg/L | | | 11/17/20 18:04 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 2100 | | 50 | 17 | ug/L | | 11/12/20 10:06 | 11/12/20 23:35 | 1 |
| Manganese | 290 | B | 10 | 1.0 | ug/L | | 11/12/20 10:06 | 11/12/20 23:35 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 4.6 | | 3.0 | 1.5 | ug/L | | 11/12/20 10:06 | 11/12/20 14:54 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 30 | | 10 | 3.1 | mg/L | | | 11/17/20 18:59 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 8.2 | | 1.0 | 0.35 | mg/L | | | 11/20/20 06:06 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Client Sample ID: SHM-05-42A-FAL20

**Lab Sample ID: 680-191327-5**
**Date Collected: 11/09/20 13:10**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 7.4 | | 0.50 | 0.20 | mg/L | | | 11/17/20 18:16 | 1 |
| Sulfate | 7.6 | M | 1.0 | 0.40 | mg/L | | | 11/17/20 18:16 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 49 | J | 50 | 17 | ug/L | | 11/12/20 10:26 | 11/14/20 01:38 | 1 |
| Manganese | 100 | | 10 | 1.0 | ug/L | | 11/12/20 10:26 | 11/14/20 01:38 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/12/20 10:26 | 11/12/20 15:48 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 26 | | 10 | 3.1 | mg/L | | | 11/17/20 19:03 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.1 | | 1.0 | 0.35 | mg/L | | | 11/20/20 07:23 | 1 |

## Client Sample ID: SHM-05-42B-FAL20

**Lab Sample ID: 680-191327-6**
**Date Collected: 11/09/20 14:15**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 38 | | 0.50 | 0.20 | mg/L | | | 11/17/20 18:29 | 1 |
| Sulfate | 9.4 | M | 1.0 | 0.40 | mg/L | | | 11/17/20 18:29 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 28000 | | 50 | 17 | ug/L | | 11/12/20 10:26 | 11/14/20 01:43 | 1 |
| Manganese | 6200 | | 10 | 1.0 | ug/L | | 11/12/20 10:26 | 11/14/20 01:43 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 160 | | 3.0 | 1.5 | ug/L | | 11/12/20 10:26 | 11/12/20 15:51 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 170 | | 10 | 3.1 | mg/L | | | 11/17/20 19:09 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.8 | | 1.0 | 0.35 | mg/L | | | 11/20/20 08:52 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Client Sample ID: SHM-10-10-FAL20

**Lab Sample ID: 680-191327-7**
**Date Collected: 11/09/20 13:10**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 64 | | 0.50 | 0.20 | mg/L | | | 11/17/20 18:42 | 1 |
| Sulfate | 3.9 | M | 1.0 | 0.40 | mg/L | | | 11/17/20 18:42 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/12/20 10:26 | 11/14/20 01:12 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/12/20 10:26 | 11/14/20 01:12 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/12/20 10:26 | 11/12/20 15:32 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | | 10 | 3.1 | mg/L | | | 11/17/20 19:15 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.8 | | 1.0 | 0.35 | mg/L | | | 11/20/20 09:11 | 1 |

## Client Sample ID: SHM-13-01-FAL20

**Lab Sample ID: 680-191327-8**
**Date Collected: 11/09/20 11:05**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 150 | M | 0.50 | 0.20 | mg/L | | | 11/17/20 18:54 | 1 |
| Sulfate | 8.7 | | 1.0 | 0.40 | mg/L | | | 11/17/20 18:54 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 31 | J | 50 | 17 | ug/L | | 11/12/20 10:26 | 11/14/20 00:46 | 1 |
| Manganese | 4.3 | J | 10 | 1.0 | ug/L | | 11/12/20 10:26 | 11/14/20 00:46 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U J | 3.0 | 1.5 | ug/L | | 11/12/20 10:26 | 11/12/20 15:16 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 20 | | 10 | 3.1 | mg/L | | | 11/17/20 19:20 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.2 | | 1.0 | 0.35 | mg/L | | | 11/20/20 09:29 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Client Sample ID: SHM-13-06-FAL20

**Lab Sample ID: 680-191327-9**
**Date Collected: 11/09/20 15:20**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 120 | | 2.5 | 1.0 | mg/L | | | 11/17/20 19:07 | 5 |
| Sulfate | 6.7 | | 5.0 | 2.0 | mg/L | | | 11/17/20 19:07 | 5 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 20000 | | 50 | 17 | ug/L | | 11/12/20 10:06 | 11/12/20 23:27 | 1 |
| Manganese | 980 | B | 10 | 1.0 | ug/L | | 11/12/20 10:06 | 11/12/20 23:27 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2200 | | 3.0 | 1.5 | ug/L | | 11/12/20 10:06 | 11/12/20 14:48 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 51 | | 10 | 3.1 | mg/L | | | 11/17/20 19:25 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.7 | | 1.0 | 0.35 | mg/L | | | 11/20/20 09:49 | 1 |

## Client Sample ID: SHP-2016-5A-FAL20

**Lab Sample ID: 680-191327-10**
**Date Collected: 11/09/20 10:00**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 39 | | 0.50 | 0.20 | mg/L | | | 11/17/20 19:19 | 1 |
| Sulfate | 2.7 | | 1.0 | 0.40 | mg/L | | | 11/17/20 19:19 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 2200 | | 50 | 17 | ug/L | | 11/12/20 10:06 | 11/12/20 23:31 | 1 |
| Manganese | 200 | B | 10 | 1.0 | ug/L | | 11/12/20 10:06 | 11/12/20 23:31 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.9 | | 3.0 | 1.5 | ug/L | | 11/12/20 10:06 | 11/12/20 14:51 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 56 | | 10 | 3.1 | mg/L | | | 11/17/20 19:30 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 5.5 | | 1.0 | 0.35 | mg/L | | | 11/20/20 10:06 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Client Sample ID: SHP-2016-5B-FAL20

**Lab Sample ID: 680-191327-11**

**Date Collected: 11/09/20 11:10**
**Date Received: 11/11/20 09:30**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 25 | | 0.50 | 0.20 | mg/L | | | 11/17/20 20:48 | 1 |
| Sulfate | 9.6 | | 1.0 | 0.40 | mg/L | | | 11/17/20 20:48 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 57000 | | 50 | 17 | ug/L | | 11/12/20 10:06 | 11/12/20 23:23 | 1 |
| Manganese | 2600 | B | 10 | 1.0 | ug/L | | 11/12/20 10:06 | 11/12/20 23:23 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 730 | | 3.0 | 1.5 | ug/L | | 11/12/20 10:06 | 11/12/20 14:45 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 160 | | 10 | 3.1 | mg/L | | | 11/17/20 19:36 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.7 | | 1.0 | 0.35 | mg/L | | | 11/20/20 10:24 | 1 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-644389/2**
**Matrix: Water**
**Analysis Batch: 644389**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/17/20 16:10 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/17/20 16:10 | 1 |

**Lab Sample ID: LCS 680-644389/3**
**Matrix: Water**
**Analysis Batch: 644389**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.1 | | mg/L | | 101 | 87 - 111 |
| Sulfate | 10.0 | 10.2 | | mg/L | | 102 | 87 - 112 |

**Lab Sample ID: LCSD 680-644389/4**
**Matrix: Water**
**Analysis Batch: 644389**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.1 | | mg/L | | 101 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.2 | | mg/L | | 102 | 87 - 112 | 0 | 15 |

**Lab Sample ID: 680-191327-1 MS**
**Matrix: Water**
**Analysis Batch: 644389**

**Client Sample ID: SHL-10-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.1 | | 10.0 | 11.4 | | mg/L | | 103 | 87 - 111 |
| Sulfate | 4.0 | | 10.0 | 14.6 | | mg/L | | 106 | 87 - 112 |

**Lab Sample ID: 680-191327-1 MSD**
**Matrix: Water**
**Analysis Batch: 644389**

**Client Sample ID: SHL-10-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.1 | | 10.0 | 11.6 | | mg/L | | 105 | 87 - 111 | 2 | 15 |
| Sulfate | 4.0 | | 10.0 | 14.9 | | mg/L | | 109 | 87 - 112 | 2 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-643664/1-A**
**Matrix: Water**
**Analysis Batch: 643859**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 643664**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/12/20 10:06 | 11/12/20 21:43 | 1 |
| Manganese | 5.66 | J | 10 | 1.0 | ug/L | | 11/12/20 10:06 | 11/12/20 21:43 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 680-643664/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 643859** — **Prep Batch: 643664**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 5040 | | ug/L | | 101 | 87 - 115 |
| Manganese | 400 | 406 | | ug/L | | 101 | 90 - 114 |

**Lab Sample ID: MB 680-643718/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 644236** — **Prep Batch: 643718**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/12/20 10:26 | 11/14/20 00:35 | 1 |
| Manganese | 3.77 | J | 10 | 1.0 | ug/L | | 11/12/20 10:26 | 11/14/20 00:35 | 1 |

**Lab Sample ID: LCS 680-643718/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 644236** — **Prep Batch: 643718**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 5100 | | ug/L | | 102 | 87 - 115 |
| Manganese | 400 | 417 | | ug/L | | 104 | 90 - 114 |

**Lab Sample ID: 680-191327-8 MS** — **Client Sample ID: SHM-13-01-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644236** — **Prep Batch: 643718**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 31 | J | 5000 | 4960 | | ug/L | | 99 | 87 - 115 |
| Manganese | 4.3 | J | 400 | 403 | | ug/L | | 100 | 90 - 114 |

**Lab Sample ID: 680-191327-8 MSD** — **Client Sample ID: SHM-13-01-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644236** — **Prep Batch: 643718**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 31 | J | 5000 | 4820 | | ug/L | | 96 | 87 - 115 | 3 | 20 |
| Manganese | 4.3 | J | 400 | 7270 | J | ug/L | | 1815 | 90 - 114 | 179 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-643663/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 643840** — **Prep Batch: 643663**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/12/20 10:06 | 11/12/20 14:16 | 1 |

**Lab Sample ID: LCS 680-643663/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 643840** — **Prep Batch: 643663**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 113 | | ug/L | | 113 | 84 - 116 |

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: MB 680-643716/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 643840** — **Prep Batch: 643716**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/12/20 10:26 | 11/12/20 15:10 | 1 |

**Lab Sample ID: LCS 680-643716/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 643840** — **Prep Batch: 643716**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 113 | | ug/L | | 113 | 84 - 116 |

**Lab Sample ID: 680-191327-8 MS** — **Client Sample ID: SHM-13-01-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643840** — **Prep Batch: 643716**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U J | 100 | 57.7 | J | ug/L | | 58 | 84 - 116 |

**Lab Sample ID: 680-191327-8 MSD** — **Client Sample ID: SHM-13-01-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643840** — **Prep Batch: 643716**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U J | 100 | 146 | J | ug/L | | 146 | 84 - 116 | 87 | 20 |

## Method: 9060A - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-517641/35** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517641**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.408 | J | 1.0 | 0.35 | mg/L | | | 11/20/20 06:46 | 1 |

**Lab Sample ID: MB 280-517641/4** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517641**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/19/20 19:35 | 1 |

**Lab Sample ID: LCS 280-517641/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517641**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 26.1 | | mg/L | | 104 | 88 - 112 |

## Method: 9060A - Organic Carbon, Dissolved (DOC) (Continued)

**Lab Sample ID: LCS 280-517641/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517641**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | | | 25.0 | 23.2 | | mg/L | | 93 | 88 - 112 | | |

**Lab Sample ID: 680-191327-5 MS** — **Client Sample ID: SHM-05-42A-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517641**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.1 | | 25.0 | 26.5 | | mg/L | | 101 | 88 - 112 | | |

**Lab Sample ID: 680-191327-5 MSD** — **Client Sample ID: SHM-05-42A-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517641**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.1 | | 25.0 | 26.7 | | mg/L | | 102 | 88 - 112 | 1 | 15 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-517139/31** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 517139**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/17/20 14:59 | 1 |

**Lab Sample ID: MB 280-517139/57** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 517139**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/17/20 17:42 | 1 |

**Lab Sample ID: LCS 280-517139/30** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 517139**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 209 | | mg/L | | 105 | 89 - 109 | | |

**Lab Sample ID: LCS 280-517139/56** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 517139**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 192 | | mg/L | | 96 | 89 - 109 | | |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## HPLC/IC

### Analysis Batch: 644389

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191327-1 | SHL-10-FAL20 | Total/NA | Water | 9056A | |
| 680-191327-2 | SHL-RB1-FAL20 | Total/NA | Water | 9056A | |
| 680-191327-3 | SHL-3-FAL20 | Total/NA | Water | 9056A | |
| 680-191327-4 | SHL-5-FAL20 | Total/NA | Water | 9056A | |
| 680-191327-5 | SHM-05-42A-FAL20 | Total/NA | Water | 9056A | |
| 680-191327-6 | SHM-05-42B-FAL20 | Total/NA | Water | 9056A | |
| 680-191327-7 | SHM-10-10-FAL20 | Total/NA | Water | 9056A | |
| 680-191327-8 | SHM-13-01-FAL20 | Total/NA | Water | 9056A | |
| 680-191327-9 | SHM-13-06-FAL20 | Total/NA | Water | 9056A | |
| 680-191327-10 | SHP-2016-5A-FAL20 | Total/NA | Water | 9056A | |
| 680-191327-11 | SHP-2016-5B-FAL20 | Total/NA | Water | 9056A | |
| MB 680-644389/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-644389/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-644389/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-191327-1 MS | SHL-10-FAL20 | Total/NA | Water | 9056A | |
| 680-191327-1 MSD | SHL-10-FAL20 | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 643663

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191327-1 | SHL-10-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-4 | SHL-5-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-9 | SHM-13-06-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-10 | SHP-2016-5A-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-11 | SHP-2016-5B-FAL20 | Dissolved | Water | 3005A | |
| MB 680-643663/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-643663/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 643664

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191327-1 | SHL-10-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-4 | SHL-5-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-9 | SHM-13-06-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-10 | SHP-2016-5A-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-11 | SHP-2016-5B-FAL20 | Dissolved | Water | 3005A | |
| MB 680-643664/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-643664/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 643716

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191327-2 | SHL-RB1-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-3 | SHL-3-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-5 | SHM-05-42A-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-6 | SHM-05-42B-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-7 | SHM-10-10-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-8 | SHM-13-01-FAL20 | Dissolved | Water | 3005A | |
| MB 680-643716/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-643716/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191327-8 MS | SHM-13-01-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-8 MSD | SHM-13-01-FAL20 | Dissolved | Water | 3005A | |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Metals

### Prep Batch: 643718

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191327-2 | SHL-RB1-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-3 | SHL-3-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-5 | SHM-05-42A-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-6 | SHM-05-42B-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-7 | SHM-10-10-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-8 | SHM-13-01-FAL20 | Dissolved | Water | 3005A | |
| MB 680-643718/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-643718/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191327-8 MS | SHM-13-01-FAL20 | Dissolved | Water | 3005A | |
| 680-191327-8 MSD | SHM-13-01-FAL20 | Dissolved | Water | 3005A | |

### Analysis Batch: 643840

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191327-1 | SHL-10-FAL20 | Dissolved | Water | 6020A | 643663 |
| 680-191327-2 | SHL-RB1-FAL20 | Dissolved | Water | 6020A | 643716 |
| 680-191327-3 | SHL-3-FAL20 | Dissolved | Water | 6020A | 643716 |
| 680-191327-4 | SHL-5-FAL20 | Dissolved | Water | 6020A | 643663 |
| 680-191327-5 | SHM-05-42A-FAL20 | Dissolved | Water | 6020A | 643716 |
| 680-191327-6 | SHM-05-42B-FAL20 | Dissolved | Water | 6020A | 643716 |
| 680-191327-7 | SHM-10-10-FAL20 | Dissolved | Water | 6020A | 643716 |
| 680-191327-8 | SHM-13-01-FAL20 | Dissolved | Water | 6020A | 643716 |
| 680-191327-9 | SHM-13-06-FAL20 | Dissolved | Water | 6020A | 643663 |
| 680-191327-10 | SHP-2016-5A-FAL20 | Dissolved | Water | 6020A | 643663 |
| 680-191327-11 | SHP-2016-5B-FAL20 | Dissolved | Water | 6020A | 643663 |
| MB 680-643663/1-A | Method Blank | Total Recoverable | Water | 6020A | 643663 |
| MB 680-643716/1-A | Method Blank | Total Recoverable | Water | 6020A | 643716 |
| LCS 680-643663/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 643663 |
| LCS 680-643716/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 643716 |
| 680-191327-8 MS | SHM-13-01-FAL20 | Dissolved | Water | 6020A | 643716 |
| 680-191327-8 MSD | SHM-13-01-FAL20 | Dissolved | Water | 6020A | 643716 |

### Analysis Batch: 643859

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191327-1 | SHL-10-FAL20 | Dissolved | Water | 6010C | 643664 |
| 680-191327-4 | SHL-5-FAL20 | Dissolved | Water | 6010C | 643664 |
| 680-191327-9 | SHM-13-06-FAL20 | Dissolved | Water | 6010C | 643664 |
| 680-191327-10 | SHP-2016-5A-FAL20 | Dissolved | Water | 6010C | 643664 |
| 680-191327-11 | SHP-2016-5B-FAL20 | Dissolved | Water | 6010C | 643664 |
| MB 680-643664/1-A | Method Blank | Total Recoverable | Water | 6010C | 643664 |
| LCS 680-643664/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 643664 |

### Analysis Batch: 644236

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191327-2 | SHL-RB1-FAL20 | Dissolved | Water | 6010C | 643718 |
| 680-191327-3 | SHL-3-FAL20 | Dissolved | Water | 6010C | 643718 |
| 680-191327-5 | SHM-05-42A-FAL20 | Dissolved | Water | 6010C | 643718 |
| 680-191327-6 | SHM-05-42B-FAL20 | Dissolved | Water | 6010C | 643718 |
| 680-191327-7 | SHM-10-10-FAL20 | Dissolved | Water | 6010C | 643718 |
| 680-191327-8 | SHM-13-01-FAL20 | Dissolved | Water | 6010C | 643718 |
| MB 680-643718/1-A | Method Blank | Total Recoverable | Water | 6010C | 643718 |
| LCS 680-643718/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 643718 |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Metals (Continued)

### Analysis Batch: 644236 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191327-8 MS | SHM-13-01-FAL20 | Dissolved | Water | 6010C | 643718 |
| 680-191327-8 MSD | SHM-13-01-FAL20 | Dissolved | Water | 6010C | 643718 |

## General Chemistry

### Analysis Batch: 517139

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191327-1 | SHL-10-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191327-2 | SHL-RB1-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191327-3 | SHL-3-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191327-4 | SHL-5-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191327-5 | SHM-05-42A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191327-6 | SHM-05-42B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191327-7 | SHM-10-10-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191327-8 | SHM-13-01-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191327-9 | SHM-13-06-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191327-10 | SHP-2016-5A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191327-11 | SHP-2016-5B-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-517139/31 | Method Blank | Total/NA | Water | SM 2320B | |
| MB 280-517139/57 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-517139/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| LCS 280-517139/56 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Analysis Batch: 517641

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191327-1 | SHL-10-FAL20 | Dissolved | Water | 9060A | |
| 680-191327-2 | SHL-RB1-FAL20 | Dissolved | Water | 9060A | |
| 680-191327-3 | SHL-3-FAL20 | Dissolved | Water | 9060A | |
| 680-191327-4 | SHL-5-FAL20 | Dissolved | Water | 9060A | |
| 680-191327-5 | SHM-05-42A-FAL20 | Dissolved | Water | 9060A | |
| 680-191327-6 | SHM-05-42B-FAL20 | Dissolved | Water | 9060A | |
| 680-191327-7 | SHM-10-10-FAL20 | Dissolved | Water | 9060A | |
| 680-191327-8 | SHM-13-01-FAL20 | Dissolved | Water | 9060A | |
| 680-191327-9 | SHM-13-06-FAL20 | Dissolved | Water | 9060A | |
| 680-191327-10 | SHP-2016-5A-FAL20 | Dissolved | Water | 9060A | |
| 680-191327-11 | SHP-2016-5B-FAL20 | Dissolved | Water | 9060A | |
| MB 280-517641/35 | Method Blank | Dissolved | Water | 9060A | |
| MB 280-517641/4 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-517641/3 | Lab Control Sample | Dissolved | Water | 9060A | |
| LCS 280-517641/34 | Lab Control Sample | Dissolved | Water | 9060A | |
| 680-191327-5 MS | SHM-05-42A-FAL20 | Dissolved | Water | 9060A | |
| 680-191327-5 MSD | SHM-05-42A-FAL20 | Dissolved | Water | 9060A | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Client Sample ID: SHL-10-FAL20

**Lab Sample ID: 680-191327-1**

**Date Collected: 11/09/20 12:00**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644389 | 11/17/20 17:00 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643664 | 11/12/20 10:06 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643859 | 11/12/20 23:48 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643663 | 11/12/20 10:06 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643840 | 11/12/20 14:57 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517641 | 11/20/20 05:06 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517139 | 11/17/20 18:33 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHL-RB1-FAL20

**Lab Sample ID: 680-191327-2**

**Date Collected: 11/09/20 13:00**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644389 | 11/17/20 17:38 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643718 | 11/12/20 10:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644236 | 11/14/20 01:17 | BWR | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643716 | 11/12/20 10:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643840 | 11/12/20 15:35 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517641 | 11/20/20 05:26 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517139 | 11/17/20 18:38 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHL-3-FAL20

**Lab Sample ID: 680-191327-3**

**Date Collected: 11/09/20 15:25**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644389 | 11/17/20 17:51 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643718 | 11/12/20 10:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644236 | 11/14/20 01:22 | BWR | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643716 | 11/12/20 10:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643840 | 11/12/20 15:38 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Client Sample ID: SHL-3-FAL20

**Lab Sample ID: 680-191327-3**

**Date Collected: 11/09/20 15:25**
**Date Received: 11/11/20 09:30**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517641 | 11/20/20 05:49 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517139 | 11/17/20 18:43 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHL-5-FAL20

**Lab Sample ID: 680-191327-4**

**Date Collected: 11/09/20 15:45**
**Date Received: 11/11/20 09:30**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644389 | 11/17/20 18:04 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643664 | 11/12/20 10:06 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643859 | 11/12/20 23:35 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643663 | 11/12/20 10:06 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643840 | 11/12/20 14:54 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517641 | 11/20/20 06:06 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517139 | 11/17/20 18:59 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-05-42A-FAL20

**Lab Sample ID: 680-191327-5**

**Date Collected: 11/09/20 13:10**
**Date Received: 11/11/20 09:30**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644389 | 11/17/20 18:16 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643718 | 11/12/20 10:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644236 | 11/14/20 01:38 | BWR | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643716 | 11/12/20 10:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643840 | 11/12/20 15:48 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517641 | 11/20/20 07:23 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517139 | 11/17/20 19:03 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Client Sample ID: SHM-05-42B-FAL20

**Lab Sample ID: 680-191327-6**
**Date Collected: 11/09/20 14:15**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644389 | 11/17/20 18:29 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643718 | 11/12/20 10:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644236 | 11/14/20 01:43 | BWR | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643716 | 11/12/20 10:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643840 | 11/12/20 15:51 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517641 | 11/20/20 08:52 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517139 | 11/17/20 19:09 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-10-10-FAL20

**Lab Sample ID: 680-191327-7**
**Date Collected: 11/09/20 13:10**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644389 | 11/17/20 18:42 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643718 | 11/12/20 10:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644236 | 11/14/20 01:12 | BWR | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643716 | 11/12/20 10:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643840 | 11/12/20 15:32 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517641 | 11/20/20 09:11 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517139 | 11/17/20 19:15 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-13-01-FAL20

**Lab Sample ID: 680-191327-8**
**Date Collected: 11/09/20 11:05**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644389 | 11/17/20 18:54 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643718 | 11/12/20 10:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644236 | 11/14/20 00:46 | BWR | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643716 | 11/12/20 10:26 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643840 | 11/12/20 15:16 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Client Sample ID: SHM-13-01-FAL20

**Lab Sample ID: 680-191327-8**
**Date Collected: 11/09/20 11:05**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517641 | 11/20/20 09:29 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517139 | 11/17/20 19:20 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-13-06-FAL20

**Lab Sample ID: 680-191327-9**
**Date Collected: 11/09/20 15:20**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 5 | 5 mL | 5 mL | 644389 | 11/17/20 19:07 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643664 | 11/12/20 10:06 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643859 | 11/12/20 23:27 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643663 | 11/12/20 10:06 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643840 | 11/12/20 14:48 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517641 | 11/20/20 09:49 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517139 | 11/17/20 19:25 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHP-2016-5A-FAL20

**Lab Sample ID: 680-191327-10**
**Date Collected: 11/09/20 10:00**
**Matrix: Water**
**Date Received: 11/11/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644389 | 11/17/20 19:19 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643664 | 11/12/20 10:06 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643859 | 11/12/20 23:31 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643663 | 11/12/20 10:06 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643840 | 11/12/20 14:51 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517641 | 11/20/20 10:06 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517139 | 11/17/20 19:30 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Client Sample ID: SHP-2016-5B-FAL20

**Date Collected: 11/09/20 11:10**
**Date Received: 11/11/20 09:30**

## Lab Sample ID: 680-191327-11

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644389 | 11/17/20 20:48 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643664 | 11/12/20 10:06 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643859 | 11/12/20 23:23 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643663 | 11/12/20 10:06 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643840 | 11/12/20 14:45 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517641 | 11/20/20 10:24 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517139 | 11/17/20 19:36 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

## Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| ANAB | Dept. of Defense ELAP | L2463 | 09-22-22 |

## Laboratory: Eurofins TestAmerica, Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| A2LA | Dept. of Defense ELAP | 2907.01 | 10-31-21 |

# Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191327-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060A | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | TAL SAV |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-191327 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) 46 | SW6010C/FLDFLT (B) 9 | SW6020A/FLDFLT (B) 9 | SW9056A (A) 5 | SW9060A/FLDFLT (B) 3 | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | PZ-12-02-FAL20 | WG | | | | X | X | X | X | X | PZ-12-02 | N1 | 24.00 | 34.00 | | |
| 20 | PZ-12-03-FAL20 | WG | | | | X | X | X | X | X | PZ-12-03 | N1 | 24.00 | 34.00 | | |
| 21 | PZ-12-04-FAL20 | WG | | | | X | X | X | X | X | PZ-12-04 | N1 | 24.00 | 34.00 | | |
| 22 | PZ-12-05-FAL20 | WG | | | | X | X | X | X | X | PZ-12-05 | N1 | 26.00 | 36.00 | | |
| 23 | PZ-12-06-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | N1 | 25.00 | 35.00 | | |
| 24 | PZ-12-07-FAL20 | WG | | | | X | X | X | X | X | PZ-12-07 | N1 | 20.00 | 30.00 | | |
| 25 | PZ-12-08-FAL20 | WG | | | | X | X | X | X | X | PZ-12-08 | N1 | 22.00 | 32.00 | | |
| 26 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | PZ-12-09 | MS1 | 20.00 | 30.00 | | |
| 27 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | PZ-12-09 | N1 | 20.00 | 30.00 | | |
| 28 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | PZ-12-09 | SD1 | 20.00 | 30.00 | | |
| 29 | PZ-12-10-FAL20 | WG | | | | X | X | X | X | X | PZ-12-10 | N1 | 20.00 | 30.00 | | |
| 30 | SHL-10-FAL20 | WG | 11-9-20 | 1200 | DC | X | X | X | X | X | SHL-10 | N1 | 24.00 | 39.00 | | |
| 31 | ~~SHL-11-FAL20~~ RB-SHL-FAL20 | WG | 11-9-20 | 1300 | DC | X | X | X | X | X | SHL-11 | N1 | 12.00 | 27.00 | | RB-SHL-FAL20 |
| 32 | SHL-12-FAL20 | WG | | | | X | X | X | X | X | SHL-12 | N1 | 15.00 | 30.00 | | |
| 33 | SHL-15-FAL20 | WG | | | | X | X | X | X | X | SHL-15 | N1 | 14.00 | 24.00 | | |
| 34 | SHL-19-FAL20 | WG | | | | X | X | X | X | X | SHL-19 | N1 | 20.00 | 30.00 | | |
| 35 | SHL-20-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | N1 | 39.00 | 49.00 | | |
| 36 | SHL-22-FAL20 | WG | | | | X | X | X | X | X | SHL-22 | N1 | 105.00 | 115.00 | | |

**Relinquished by:** Samuel Redard
**Date** 11/9/20
**Time** 17:30
Received by: ETA
SHL_eCOC

**Date** 11/10/20
**Time** 1700
**Shipping Date:** ETA
Received by Laboratory: 11-11-20 0930
Condition:

1.2/1.3(CF)
1.5/1.6°C

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 37 | SHL-23-FAL20 | WG | | | | X | X | X | X | X | SHL-23 | N1 | 23.00 | 33.00 | | |
| 38 | SHL-24-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | N1 | 110.00 | 120.00 | | |
| 39 | SHL-3-FAL20 | WG | 11-9-20 | 1525 | DC | X | X | X | X | X | SHL-3 | N1 | 24.00 | 34.00 | | |
| 40 | SHL-4-FAL20 | WG | | | | X | X | X | X | X | SHL-4 | N1 | 3.00 | 13.00 | | |
| 41 | SHL-5-FAL20 | WG | 11-9-20 | 1545 | CR | X | X | X | X | X | SHL-5 | N1 | 3.00 | 13.00 | | |
| 42 | SHL-7-FAL20 | WG | | | | X | X | X | X | X | SHL-7 | N1 | 11.00 | 21.00 | | |
| 43 | SHL-8D-FAL20 | WG | | | | X | X | X | X | X | SHL-8D | N1 | 68.00 | 70.00 | | |
| 44 | SHL-8S-FAL20 | WG | | | | X | X | X | X | X | SHL-8S | N1 | 52.00 | 54.00 | | |
| 45 | SHL-9-FAL20 | WG | | | | X | X | X | X | X | SHL-9 | N1 | 15.00 | 25.00 | | |
| 46 | SHL-DUP01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | FD1 | 25.00 | 35.00 | | |
| 47 | SHL-DUP02-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | FD1 | 39.00 | 49.00 | | |
| 48 | SHL-DUP03-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | FD1 | 25.00 | 35.00 | | |
| 49 | SHL-DUP04-FAL20 | WG | | | | X | X | X | X | X | SHP-01-38A | FD1 | 1.50 | 6.50 | | |
| 50 | SHL-DUP05-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | FD1 | 22.00 | 32.00 | | |
| 51 | SHL-DUP06-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | FD1 | 79.50 | 84.50 | | |
| 52 | SHL-DUP07-FAL20 | WG | | | | X | X | X | X | X | SHL-22 | FD1 | 105.00 | 115.00 | | |
| 53 | SHL-DUP08-FAL20 | WG | | | | X | X | X | X | X | SHM-96-5B | FD1 | 80.00 | 90.00 | | |
| 53 | SHL-DUP09-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | FD1 | 110.00 | 120.00 | | |

**Relinquished by:** Diane Clapp
**Date**
**Time**
Received by: 11/9/20 17:30 ETA
SHL_eCOC

**Date** 11/10/20 ETA
**Time** 1700
**Shipping Date:**
Received by Laboratory:
Condition: 11-11-20 0930



11/24/2020

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 53 | SHL-DUP10-FAL20 | WG | | | | X | X | X | X | X | SHM-05-40X | FD1 | 32.00 | 34.00 | | |
| 54 | SHM-05-39A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-39A | N1 | 37.00 | 39.00 | | |
| 55 | SHM-05-39B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-39B | N1 | 66.00 | 68.00 | | |
| 56 | SHM-05-40X-FAL20 | WG | | | | X | X | X | X | X | SHM-05-40X | N1 | 32.00 | 34.00 | | |
| 57 | SHM-05-41A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41A | N1 | 42.00 | 44.00 | | |
| 58 | SHM-05-41B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41B | N1 | 62.00 | 64.00 | | |
| 59 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | MS1 | 88.00 | 93.00 | | |
| 60 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | N1 | 88.00 | 93.00 | | |
| 61 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | SD1 | 88.00 | 93.00 | | |
| 62 | SHM-05-42A-FAL20 | WG | 11-9-20 | 1310 | CR | X | X | X | X | X | SHM-05-42A | N1 | 40.00 | 42.00 | | |
| 63 | SHM-05-42B-FAL20 | WG | 11-9-20 | 1415 | CR | X | X | X | X | X | SHM-05-42B | N1 | 70.00 | 72.00 | | |
| 64 | SHM-07-03-FAL20 | WG | | | | X | X | X | X | X | SHM-07-03 | N1 | 25.00 | 35.00 | | |
| 65 | SHM-07-05X-FAL20 | WG | | | | X | X | X | X | X | SHM-07-05X | N1 | 55.00 | 65.00 | | |
| 66 | SHM-10-02-FAL20 | WG | | | | X | X | X | X | X | SHM-10-02 | N1 | 53.00 | 63.00 | | |
| 67 | SHM-10-03-FAL20 | WG | | | | X | X | X | X | X | SHM-10-03 | N1 | 58.50 | 68.50 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | MS1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | N1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | SD1 | 55.00 | 65.00 | | |

**Relinquished by:** Diane Clapper
**Date** 11/9/20
**Time** 17:30
Received by: Ruth ETA
SHL_eCOC

**Date** 11/10/20 ETA
**Time** 1700
**Shipping Date:**
Received by Laboratory: CB Bauder 11-11-20 0930
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| **3** | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| **5** | 1x 125mL plastic, Cool < 6degC |
| **9** | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| **46** | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) 46 | SW6010C/FLDFLT (B) 9 | SW6020A/FLDFLT (B) 9 | SW9056A (A) 5 | SW9060A/FLDFLT (B) 3 | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69 | SHM-10-05A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-05A | N1 | 50.00 | 60.00 | | |
| 70 | SHM-10-06-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06 | N1 | 69.50 | 79.50 | | |
| 71 | SHM-10-06A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06A | N1 | 77.00 | 87.00 | | |
| 72 | SHM-10-07-FAL20 | WG | | | | X | X | X | X | X | SHM-10-07 | N1 | 40.00 | 50.00 | | |
| 73 | SHM-10-08-FAL20 | WG | | | | X | X | X | X | X | SHM-10-08 | N1 | 46.00 | 56.00 | | |
| 74 | SHM-10-10-FAL20 | WG | 11-9-20 | 1310 | DB | X | X | X | X | X | SHM-10-10 | N1 | 56.00 | 66.00 | | |
| 75 | SHM-10-11-FAL20 | WG | | | | X | X | X | X | X | SHM-10-11 | N1 | 50.00 | 60.00 | | |
| 76 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | MS1 | 45.00 | 55.00 | | |
| 77 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | N1 | 45.00 | 55.00 | | |
| 78 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | SD1 | 45.00 | 55.00 | | |
| 79 | SHM-10-13-FAL20 | WG | | | | X | X | X | X | X | SHM-10-13 | N1 | 60.00 | 70.00 | | |
| 80 | SHM-10-14-FAL20 | WG | | | | X | X | X | X | X | SHM-10-14 | N1 | 60.00 | 80.00 | | |
| 81 | SHM-10-15-FAL20 | WG | | | | X | X | X | X | X | SHM-10-15 | N1 | 45.00 | 55.00 | | |
| 82 | SHM-10-16-FAL20 | WG | | | | X | X | X | X | X | SHM-10-16 | N1 | 75.00 | 85.00 | | |
| 83 | SHM-11-02-FAL20 | WG | | | | X | X | X | X | X | SHM-11-02 | N1 | 52.00 | 66.00 | | |
| 84 | SHM-11-06-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | N1 | 25.00 | 35.00 | | |
| 85 | SHM-13-01-FAL20 | WG | 11-9-20 | 1105 | DB | X | X | X | X | X | SHM-13-01 | N1 | 39.00 | 49.00 | | |
| 86 | SHM-13-02-FAL20 | WG | | | | X | X | X | X | X | SHM-13-02 | N1 | 60.00 | 70.00 | | |

**Relinquished by:** [signature]
**Date** 11/9/20
**Time** 17:30
Received by: [signature] ETA
SHL_eCOC

**Date** [signature] ETA 11/10/20
**Time** 17:00
**Shipping Date:**
Received by Laboratory: [signature] 11-11-20 0930
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

| | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 | | | | **Analytical Test Method** | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **46** | **9** | **9** | **5** | **3** | | | | | | | | | | | |
| | Sample ID | Matrix | Date | Time | Samp Init. | | | | | | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
| 87 | SHM-13-03-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-03 | N1 | 42.00 | 52.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-04 | MS1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-04 | N1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-04 | SD1 | 20.00 | 30.00 | | |
| 89 | SHM-13-05-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-05 | N1 | 75.00 | 85.00 | | |
| 90 | SHM-13-06-FAL20 | WG | 11-9-20 | 1520 | DB | X | X | X | X | X | | | | | | SHM-13-06 | N1 | 36.00 | 46.00 | | |
| 91 | SHM-13-07-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-07 | N1 | 27.00 | 37.00 | | |
| 92 | SHM-13-08-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-08 | N1 | 55.00 | 65.00 | | |
| 93 | SHM-13-14D-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-14D | N1 | 45.00 | 55.00 | | |
| 94 | SHM-13-14S-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-14S | N1 | 5.00 | 15.00 | | |
| 95 | SHM-13-15-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-15 | N1 | 50.00 | 60.00 | | |
| 96 | SHM-93-10D-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-10D | N1 | 48.70 | 58.70 | | |
| 97 | SHM-93-18B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-18B | N1 | 78.50 | 88.50 | | |
| 98 | SHM-93-22B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-22B | N1 | 82.30 | 92.30 | | |
| 99 | SHM-93-22C-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-22C | N1 | 124.30 | 134.30 | | |
| 100 | SHM-93-24A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-24A | N1 | 13.20 | 23.20 | | |
| 101 | SHM-96-5B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-96-5B | N1 | 80.00 | 90.00 | | |
| 102 | SHM-96-5C-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-96-5C | N1 | 50.00 | 60.00 | | |

**Relinquished by:** [signature]
**Date** 11/4/20
**Time** 17:30
Received by: [signature] ETA
SHL_eCOC

**Date** [signature] ETA
**Time** 11/10/20 1700
**Shipping Date:**
Received by Laboratory: [signature] 11-11-20 0930
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 121 | SHP-2016-4A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-4A | N1 | 25.00 | 30.00 | | |
| 122 | SHP-2016-4B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-4B | N1 | 85.00 | 90.00 | | |
| 123 | SHP-2016-5A-FAL20 | WG | 11-9-20 | 1000 | CR | X | X | X | X | X | SHP-2016-5A | N1 | 25.00 | 30.00 | | |
| 124 | SHP-2016-5B-FAL20 | WG | 11-9-20 | 1110 | CR | X | X | X | X | X | SHP-2016-5B | N1 | 85.00 | 90.00 | | |
| 125 | SHP-99-29X-FAL20 | WG | | | | X | X | X | X | X | SHP-99-29X | N1 | 19.00 | 29.00 | | |

**Turnaround Time: NA**

**Relinquished by:** Diane Shepson
**Date** 11/9/20
**Time** 17:30
Received by: ETA
SHL_eCOC

**Date** 11/10/20
**Time** 1700
**Shipping Date:**
Received by Laboratory: ETA
Condition: 11-11-20 0930

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-632814.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 2 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-191327-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/23/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens - LTM | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SHL-10-FAL20 (680-191327-1) | 11/9/20 | 12:00 Eastern | | Water | | | X | X | 2 | |
| RB-SHL-FAL20 (680-191327-2) | 11/9/20 | 13:00 Eastern | | Water | | | X | X | 2 | |
| SHL-3-FAL20 (680-191327-3) | 11/9/20 | 15:25 Eastern | | Water | | | X | X | 2 | |
| SHL-5-FAL20 (680-191327-4) | 11/9/20 | 15:45 Eastern | | Water | | | X | X | 2 | |
| SHM-05-42A-FAL20 (680-191327-5) | 11/9/20 | 13:10 Eastern | | Water | | | X | X | 2 | |
| SHM-05-42B-FAL20 (680-191327-6) | 11/9/20 | 14:15 Eastern | | Water | | | X | X | 2 | |
| SHM-10-10-FAL20 (680-191327-7) | 11/9/20 | 13:10 Eastern | | Water | | | X | X | 2 | |
| SHM-13-01-FAL20 (680-191327-8) | 11/9/20 | 11:05 Eastern | | Water | | | X | X | 2 | |
| SHM-13-06-FAL20 (680-191327-9) | 11/9/20 | 15:20 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | | | |
|---|---|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
| Relinquished by: | Date/Time: 11-11-2020/1542 | Company | Received by: | Date/Time: 11/12/20 0915 | Company ETA-Rem |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: 1334429 | | Cooler Temperature(s) °C and Other Remarks: 1.3 IR # 11-0-3 | | |

Ver: 01/16/2019

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins | Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-632814.2 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 2 of 2 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-191327-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/23/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens - LTM | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SHP-2016-5A-FAL20 (680-191327-10) | 11/9/20 | 10:00 Eastern | | Water | | | X | X | 2 | |
| SHP-2016-5B-FAL20 (680-191327-11) | 11/9/20 | 11:10 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) , Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | |
|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| [signature] | 11-11-2020/1542 | | [signature] | 11/12/20 0915 | ETA-Rem |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| | | |
|---|---|---|
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |

Ver: 01/16/2019

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191327-1

**Login Number: 191327**
**List Number: 1**
**Creator: Banda, Christy S**

**List Source: Eurofins TestAmerica, Savannah**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191327-1

**Login Number: 191327**
**List Number: 2**
**Creator: Pottruff, Reed W**

**List Source: Eurofins TestAmerica, Denver**
**List Creation: 11/12/20 06:50 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | N/A | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

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# ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-191377-1
Client Project/Site: Fort Devens - LTM

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

*Authorized for release by:*
*11/30/2020 4:41:09 PM*

Kathryn Smith, Client Service Manager
(912)250-0275
Kathy.Smith@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

# Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

# Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 680-191377-1 | EPA-PZ-2012-5A-FAL20 | Water | 11/10/20 12:10 | 11/12/20 09:10 | |
| 680-191377-2 | EPA-PZ-2012-5B-FAL20 | Water | 11/10/20 13:10 | 11/12/20 09:10 | |
| 680-191377-3 | SHL-8D-FAL20 | Water | 11/10/20 14:35 | 11/12/20 09:10 | |
| 680-191377-4 | SHL-8S-FAL20 | Water | 11/10/20 15:35 | 11/12/20 09:10 | |
| 680-191377-5 | SHL-DUP08-FAL20 | Water | 11/10/20 09:45 | 11/12/20 09:10 | |
| 680-191377-6 | SHM-10-02-FAL20 | Water | 11/10/20 12:00 | 11/12/20 09:10 | |
| 680-191377-7 | SHM-10-03-FAL20 | Water | 11/10/20 13:40 | 11/12/20 09:10 | |
| 680-191377-8 | SHM-10-07-FAL20 | Water | 11/10/20 16:20 | 11/12/20 09:10 | |
| 680-191377-9 | SHM-10-08-FAL20 | Water | 11/10/20 10:25 | 11/12/20 09:10 | |
| 680-191377-10 | SHM-10-14-FAL20 | Water | 11/10/20 12:25 | 11/12/20 09:10 | |
| 680-191377-11 | SHM-13-08-FAL20 | Water | 11/10/20 16:05 | 11/12/20 09:10 | |
| 680-191377-12 | SHM-96-5B-FAL20 | Water | 11/10/20 09:40 | 11/12/20 09:10 | |
| 680-191377-13 | SHM-96-5C-FAL20 | Water | 11/10/20 10:50 | 11/12/20 09:10 | |

## Job ID: 680-191377-1

**Laboratory: Eurofins TestAmerica, Savannah**

**Narrative**

# CASE NARRATIVE
# Client: Seres Engineering & Services LLC
# Project: Fort Devens - LTM

## Report Number: 680-191377-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 11/12/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.6º C and 4.8º C.

**Receipt Exceptions**
The following samples were listed on the Chain of Custody (COC); however, containers were missing due to a shipping delay: EPA-PZ-2012-5A-FAL20 (680-191377-1), EPA-PZ-2012-5B-FAL20 (680-191377-2), SHL-DUP08-FAL20 (680-191377-5), SHM-96-5B-FAL20 (680-191377-12) and SHM-96-5C-FAL20 (680-191377-13).

**METALS (ICP) - DISSOLVED**
Samples SHL-8D-FAL20 (680-191377-3), SHL-8S-FAL20 (680-191377-4), SHM-10-02-FAL20 (680-191377-6), SHM-10-03-FAL20 (680-191377-7), SHM-10-07-FAL20 (680-191377-8), SHM-10-08-FAL20 (680-191377-9), SHM-10-14-FAL20 (680-191377-10) and SHM-13-08-FAL20 (680-191377-11) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/13/2020 and analyzed on 11/16/2020.

Iron and Manganese recovered low for the MS/MSD of sample SHM-10-07-FAL20 (680-191377-8) in batch 680-644415.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples SHL-8D-FAL20 (680-191377-3), SHL-8S-FAL20 (680-191377-4), SHM-10-02-FAL20 (680-191377-6), SHM-10-03-FAL20 (680-191377-7), SHM-10-07-FAL20 (680-191377-8), SHM-10-08-FAL20 (680-191377-9), SHM-10-14-FAL20 (680-191377-10) and SHM-13-08-FAL20 (680-191377-11) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared and analyzed on 11/13/2020.

Arsenic recovered low for the MSD of sample SHM-10-07-FAL20MSD (680-191377-8) in batch 680-644041.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples SHL-8D-FAL20 (680-191377-3), SHL-8S-FAL20 (680-191377-4), SHM-10-02-FAL20 (680-191377-6), SHM-10-03-FAL20 (680-191377-7), SHM-10-07-FAL20 (680-191377-8), SHM-10-08-FAL20 (680-191377-9), SHM-10-14-FAL20 (680-191377-10) and SHM-13-08-FAL20 (680-191377-11) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 11/18/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**
Samples SHL-8D-FAL20 (680-191377-3), SHL-8S-FAL20 (680-191377-4), SHM-10-02-FAL20 (680-191377-6), SHM-10-03-FAL20 (680-191377-7), SHM-10-07-FAL20 (680-191377-8), SHM-10-08-FAL20 (680-191377-9), SHM-10-14-FAL20 (680-191377-10) and SHM-13-08-FAL20 (680-191377-11) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 11/18/2020 and 11/19/2020.

## Job ID: 680-191377-1 (Continued)

### Laboratory: Eurofins TestAmerica, Savannah (Continued)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL ORGANIC CARBON (TOC)**

Samples EPA-PZ-2012-5A-FAL20 (680-191377-1), EPA-PZ-2012-5B-FAL20 (680-191377-2), SHL-8D-FAL20 (680-191377-3), SHL-8S-FAL20 (680-191377-4), SHL-DUP08-FAL20 (680-191377-5), SHM-10-02-FAL20 (680-191377-6), SHM-10-03-FAL20 (680-191377-7), SHM-10-07-FAL20 (680-191377-8), SHM-10-08-FAL20 (680-191377-9), SHM-10-14-FAL20 (680-191377-10), SHM-13-08-FAL20 (680-191377-11), SHM-96-5B-FAL20 (680-191377-12) and SHM-96-5C-FAL20 (680-191377-13) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 11/25/2020 and 11/26/2020.

Dissolved Organic Carbon was detected in method blank MB 280-518157/36 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

## Client Sample ID: EPA-PZ-2012-5A-FAL20

**Lab Sample ID: 680-191377-1**
**Date Collected: 11/10/20 12:10**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 6.3 | | 1.0 | 0.35 | mg/L | | | 11/25/20 23:42 | 1 |

## Client Sample ID: EPA-PZ-2012-5B-FAL20

**Lab Sample ID: 680-191377-2**
**Date Collected: 11/10/20 13:10**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.5 | | 1.0 | 0.35 | mg/L | | | 11/25/20 23:59 | 1 |

## Client Sample ID: SHL-8D-FAL20

**Lab Sample ID: 680-191377-3**
**Date Collected: 11/10/20 14:35**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 45 | | 0.50 | 0.20 | mg/L | | | 11/18/20 22:26 | 1 |
| Sulfate | 7.5 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 22:26 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 100 | | 50 | 17 | ug/L | | 11/13/20 13:18 | 11/16/20 19:27 | 1 |
| Manganese | 19 | | 10 | 1.0 | ug/L | | 11/13/20 13:18 | 11/16/20 19:27 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/13/20 13:18 | 11/13/20 21:35 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 21 | | 10 | 3.1 | mg/L | | | 11/18/20 16:31 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.0 | | 1.0 | 0.35 | mg/L | | | 11/26/20 00:16 | 1 |

## Client Sample ID: SHL-8S-FAL20

**Lab Sample ID: 680-191377-4**
**Date Collected: 11/10/20 15:35**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 7.2 | | 0.50 | 0.20 | mg/L | | | 11/18/20 22:39 | 1 |
| Sulfate | 6.1 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 22:39 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 70 | | 50 | 17 | ug/L | | 11/13/20 13:18 | 11/16/20 19:22 | 1 |
| Manganese | 7.3 | J | 10 | 1.0 | ug/L | | 11/13/20 13:18 | 11/16/20 19:22 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

## Client Sample ID: SHL-8S-FAL20

**Lab Sample ID: 680-191377-4**
**Date Collected: 11/10/20 15:35**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/13/20 13:18 | 11/13/20 21:32 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 24 | | 10 | 3.1 | mg/L | | | 11/18/20 16:35 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.61 | J B | 1.0 | 0.35 | mg/L | | | 11/25/20 04:03 | 1 |

## Client Sample ID: SHL-DUP08-FAL20

**Lab Sample ID: 680-191377-5**
**Date Collected: 11/10/20 09:45**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.7 | | 1.0 | 0.35 | mg/L | | | 11/26/20 00:33 | 1 |

## Client Sample ID: SHM-10-02-FAL20

**Lab Sample ID: 680-191377-6**
**Date Collected: 11/10/20 12:00**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 150 | | 0.50 | 0.20 | mg/L | | | 11/18/20 23:04 | 1 |
| Sulfate | 6.3 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 23:04 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 62 | | 50 | 17 | ug/L | | 11/13/20 13:18 | 11/16/20 19:01 | 1 |
| Manganese | 2000 | | 10 | 1.0 | ug/L | | 11/13/20 13:18 | 11/16/20 19:01 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/13/20 13:18 | 11/13/20 21:07 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 110 | | 10 | 3.1 | mg/L | | | 11/18/20 16:47 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.2 | | 1.0 | 0.35 | mg/L | | | 11/26/20 01:20 | 1 |

## Client Sample ID: SHM-10-03-FAL20

**Lab Sample ID: 680-191377-7**
**Date Collected: 11/10/20 13:40**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 110 | | 0.50 | 0.20 | mg/L | | | 11/18/20 23:17 | 1 |
| Sulfate | 7.5 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 23:17 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

## Client Sample ID: SHM-10-03-FAL20

**Lab Sample ID: 680-191377-7**

**Date Collected: 11/10/20 13:40**
**Date Received: 11/12/20 09:10**

**Matrix: Water**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 75 | | 50 | 17 | ug/L | | 11/13/20 13:18 | 11/16/20 19:12 | 1 |
| Manganese | 8.0 | J | 10 | 1.0 | ug/L | | 11/13/20 13:18 | 11/16/20 19:12 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.9 | J | 3.0 | 1.5 | ug/L | | 11/13/20 13:18 | 11/13/20 21:13 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 160 | | 10 | 3.1 | mg/L | | | 11/18/20 16:53 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.7 | | 1.0 | 0.35 | mg/L | | | 11/26/20 01:37 | 1 |

## Client Sample ID: SHM-10-07-FAL20

**Lab Sample ID: 680-191377-8**

**Date Collected: 11/10/20 16:20**
**Date Received: 11/12/20 09:10**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 70 | | 0.50 | 0.20 | mg/L | | | 11/18/20 23:30 | 1 |
| Sulfate | 7.0 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 23:30 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 46000 | J | 50 | 17 | ug/L | | 11/13/20 13:18 | 11/16/20 18:25 | 1 |
| Manganese | 2100 | J | 10 | 1.0 | ug/L | | 11/13/20 13:18 | 11/16/20 18:25 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1000 | J | 3.0 | 1.5 | ug/L | | 11/13/20 13:18 | 11/13/20 20:52 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 130 | | 10 | 3.1 | mg/L | | | 11/18/20 16:58 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.1 | | 1.0 | 0.35 | mg/L | | | 11/26/20 01:54 | 1 |

## Client Sample ID: SHM-10-08-FAL20

**Lab Sample ID: 680-191377-9**

**Date Collected: 11/10/20 10:25**
**Date Received: 11/12/20 09:10**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 89 | | 0.50 | 0.20 | mg/L | | | 11/18/20 23:42 | 1 |
| Sulfate | 5.2 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 23:42 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

## Client Sample ID: SHM-10-08-FAL20

**Lab Sample ID: 680-191377-9**

**Date Collected: 11/10/20 10:25**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 53 | | 50 | 17 | ug/L | | 11/13/20 13:18 | 11/16/20 19:17 | 1 |
| Manganese | 340 | | 10 | 1.0 | ug/L | | 11/13/20 13:18 | 11/16/20 19:17 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/13/20 13:18 | 11/13/20 21:23 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 220 | | 10 | 3.1 | mg/L | | | 11/18/20 17:05 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.7 | | 1.0 | 0.35 | mg/L | | | 11/26/20 02:11 | 1 |

## Client Sample ID: SHM-10-14-FAL20

**Lab Sample ID: 680-191377-10**

**Date Collected: 11/10/20 12:25**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.1 | | 0.50 | 0.20 | mg/L | | | 11/18/20 23:55 | 1 |
| Sulfate | 0.40 | U M | 1.0 | 0.40 | mg/L | | | 11/18/20 23:55 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 86000 | | 50 | 17 | ug/L | | 11/13/20 13:18 | 11/16/20 19:06 | 1 |
| Manganese | 1900 | | 10 | 1.0 | ug/L | | 11/13/20 13:18 | 11/16/20 19:06 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 5000 | | 3.0 | 1.5 | ug/L | | 11/13/20 13:18 | 11/13/20 21:10 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 250 | | 10 | 3.1 | mg/L | | | 11/18/20 17:11 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 4.1 | | 1.0 | 0.35 | mg/L | | | 11/26/20 02:28 | 1 |

## Client Sample ID: SHM-13-08-FAL20

**Lab Sample ID: 680-191377-11**

**Date Collected: 11/10/20 16:05**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 72 | | 0.50 | 0.20 | mg/L | | | 11/19/20 00:07 | 1 |
| Sulfate | 5.2 | M | 1.0 | 0.40 | mg/L | | | 11/19/20 00:07 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

## Client Sample ID: SHM-13-08-FAL20

**Lab Sample ID: 680-191377-11**

**Date Collected: 11/10/20 16:05**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 59000 | | 50 | 17 | ug/L | | 11/13/20 13:18 | 11/16/20 19:32 | 1 |
| Manganese | 2100 | | 10 | 1.0 | ug/L | | 11/13/20 13:18 | 11/16/20 19:32 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1000 | | 3.0 | 1.5 | ug/L | | 11/13/20 13:18 | 11/13/20 21:38 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 150 | | 10 | 3.1 | mg/L | | | 11/18/20 17:17 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.7 | | 1.0 | 0.35 | mg/L | | | 11/26/20 03:30 | 1 |

## Client Sample ID: SHM-96-5B-FAL20

**Lab Sample ID: 680-191377-12**

**Date Collected: 11/10/20 09:40**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.6 | | 1.0 | 0.35 | mg/L | | | 11/26/20 03:47 | 1 |

## Client Sample ID: SHM-96-5C-FAL20

**Lab Sample ID: 680-191377-13**

**Date Collected: 11/10/20 10:50**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.4 | | 1.0 | 0.35 | mg/L | | | 11/26/20 04:34 | 1 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-644575/63**
**Matrix: Water**
**Analysis Batch: 644575**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U M | 0.50 | 0.20 | mg/L | | | 11/18/20 21:10 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/18/20 21:10 | 1 |

**Lab Sample ID: LCS 680-644575/64**
**Matrix: Water**
**Analysis Batch: 644575**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.1 | | mg/L | | 101 | 87 - 111 |
| Sulfate | 10.0 | 10.0 | | mg/L | | 100 | 87 - 112 |

**Lab Sample ID: LCSD 680-644575/65**
**Matrix: Water**
**Analysis Batch: 644575**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.1 | | mg/L | | 101 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 | 1 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-643956/1-A**
**Matrix: Water**
**Analysis Batch: 644415**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 643956**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/13/20 13:18 | 11/16/20 18:14 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/13/20 13:18 | 11/16/20 18:14 | 1 |

**Lab Sample ID: LCS 680-643956/2-A**
**Matrix: Water**
**Analysis Batch: 644415**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 643956**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 5130 | | ug/L | | 103 | 87 - 115 |
| Manganese | 400 | 410 | | ug/L | | 102 | 90 - 114 |

**Lab Sample ID: 680-191377-8 MS**
**Matrix: Water**
**Analysis Batch: 644415**

**Client Sample ID: SHM-10-07-FAL20**
**Prep Type: Dissolved**
**Prep Batch: 643956**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 46000 | J | 5000 | 49600 | 4 | ug/L | | 75 | 87 - 115 |
| Manganese | 2100 | J | 400 | 2460 | 4 | ug/L | | 85 | 90 - 114 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 680-191377-8 MSD** — **Client Sample ID: SHM-10-07-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644415** — **Prep Batch: 643956**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 46000 | J | 5000 | 48800 | 4 | ug/L | | 59 | 87 - 115 | 2 | 20 |
| Manganese | 2100 | J | 400 | 2420 | 4 | ug/L | | 76 | 90 - 114 | 2 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-643927/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 644041** — **Prep Batch: 643927**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/13/20 13:18 | 11/13/20 20:45 | 1 |

**Lab Sample ID: LCS 680-643927/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 644041** — **Prep Batch: 643927**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 104 | | ug/L | | 104 | 84 - 116 |

**Lab Sample ID: 680-191377-8 MS** — **Client Sample ID: SHM-10-07-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644041** — **Prep Batch: 643927**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1000 | J | 100 | 1120 | 4 | ug/L | | 99 | 84 - 116 |

**Lab Sample ID: 680-191377-8 MSD** — **Client Sample ID: SHM-10-07-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644041** — **Prep Batch: 643927**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1000 | J | 100 | 1080 | 4 | ug/L | | 57 | 84 - 116 | 4 | 20 |

## Method: 9060A - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-518157/36** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 518157**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.589 | J | 1.0 | 0.35 | mg/L | | | 11/25/20 01:27 | 1 |

**Lab Sample ID: LCS 280-518157/35** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 518157**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 23.9 | | mg/L | | 96 | 88 - 112 |

## Method: 9060A - Organic Carbon, Dissolved (DOC) (Continued)

**Lab Sample ID: MB 280-518567/35** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 518567**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/26/20 02:58 | 1 |

**Lab Sample ID: MB 280-518567/4** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 518567**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/25/20 18:36 | 1 |

**Lab Sample ID: MB 280-518567/68** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 518567**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/26/20 11:47 | 1 |

**Lab Sample ID: LCS 280-518567/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 518567**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 25.2 | | mg/L | | 101 | 88 - 112 |

**Lab Sample ID: LCS 280-518567/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 518567**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 25.6 | | mg/L | | 102 | 88 - 112 |

**Lab Sample ID: LCS 280-518567/67** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 518567**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 26.1 | | mg/L | | 104 | 88 - 112 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-517299/31** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 517299**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/18/20 15:20 | 1 |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: MB 280-517299/57**
**Matrix: Water**
**Analysis Batch: 517299**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/18/20 17:46 | 1 |

**Lab Sample ID: LCS 280-517299/30**
**Matrix: Water**
**Analysis Batch: 517299**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 214 | | mg/L | | 107 | 89 - 109 |

**Lab Sample ID: LCS 280-517299/56**
**Matrix: Water**
**Analysis Batch: 517299**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 192 | | mg/L | | 96 | 89 - 109 |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

## HPLC/IC

### Analysis Batch: 644575

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-3 | SHL-8D-FAL20 | Total/NA | Water | 9056A | |
| 680-191377-4 | SHL-8S-FAL20 | Total/NA | Water | 9056A | |
| 680-191377-6 | SHM-10-02-FAL20 | Total/NA | Water | 9056A | |
| 680-191377-7 | SHM-10-03-FAL20 | Total/NA | Water | 9056A | |
| 680-191377-8 | SHM-10-07-FAL20 | Total/NA | Water | 9056A | |
| 680-191377-9 | SHM-10-08-FAL20 | Total/NA | Water | 9056A | |
| 680-191377-10 | SHM-10-14-FAL20 | Total/NA | Water | 9056A | |
| 680-191377-11 | SHM-13-08-FAL20 | Total/NA | Water | 9056A | |
| MB 680-644575/63 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-644575/64 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-644575/65 | Lab Control Sample Dup | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 643927

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-3 | SHL-8D-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-4 | SHL-8S-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-6 | SHM-10-02-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-7 | SHM-10-03-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-8 | SHM-10-07-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-9 | SHM-10-08-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-10 | SHM-10-14-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-11 | SHM-13-08-FAL20 | Dissolved | Water | 3005A | |
| MB 680-643927/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-643927/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191377-8 MS | SHM-10-07-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-8 MSD | SHM-10-07-FAL20 | Dissolved | Water | 3005A | |

### Prep Batch: 643956

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-3 | SHL-8D-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-4 | SHL-8S-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-6 | SHM-10-02-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-7 | SHM-10-03-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-8 | SHM-10-07-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-9 | SHM-10-08-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-10 | SHM-10-14-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-11 | SHM-13-08-FAL20 | Dissolved | Water | 3005A | |
| MB 680-643956/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-643956/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191377-8 MS | SHM-10-07-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-8 MSD | SHM-10-07-FAL20 | Dissolved | Water | 3005A | |

### Analysis Batch: 644041

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-3 | SHL-8D-FAL20 | Dissolved | Water | 6020A | 643927 |
| 680-191377-4 | SHL-8S-FAL20 | Dissolved | Water | 6020A | 643927 |
| 680-191377-6 | SHM-10-02-FAL20 | Dissolved | Water | 6020A | 643927 |
| 680-191377-7 | SHM-10-03-FAL20 | Dissolved | Water | 6020A | 643927 |
| 680-191377-8 | SHM-10-07-FAL20 | Dissolved | Water | 6020A | 643927 |

## Metals (Continued)

### Analysis Batch: 644041 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-9 | SHM-10-08-FAL20 | Dissolved | Water | 6020A | 643927 |
| 680-191377-10 | SHM-10-14-FAL20 | Dissolved | Water | 6020A | 643927 |
| 680-191377-11 | SHM-13-08-FAL20 | Dissolved | Water | 6020A | 643927 |
| MB 680-643927/1-A | Method Blank | Total Recoverable | Water | 6020A | 643927 |
| LCS 680-643927/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 643927 |
| 680-191377-8 MS | SHM-10-07-FAL20 | Dissolved | Water | 6020A | 643927 |
| 680-191377-8 MSD | SHM-10-07-FAL20 | Dissolved | Water | 6020A | 643927 |

### Analysis Batch: 644415

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-3 | SHL-8D-FAL20 | Dissolved | Water | 6010C | 643956 |
| 680-191377-4 | SHL-8S-FAL20 | Dissolved | Water | 6010C | 643956 |
| 680-191377-6 | SHM-10-02-FAL20 | Dissolved | Water | 6010C | 643956 |
| 680-191377-7 | SHM-10-03-FAL20 | Dissolved | Water | 6010C | 643956 |
| 680-191377-8 | SHM-10-07-FAL20 | Dissolved | Water | 6010C | 643956 |
| 680-191377-9 | SHM-10-08-FAL20 | Dissolved | Water | 6010C | 643956 |
| 680-191377-10 | SHM-10-14-FAL20 | Dissolved | Water | 6010C | 643956 |
| 680-191377-11 | SHM-13-08-FAL20 | Dissolved | Water | 6010C | 643956 |
| MB 680-643956/1-A | Method Blank | Total Recoverable | Water | 6010C | 643956 |
| LCS 680-643956/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 643956 |
| 680-191377-8 MS | SHM-10-07-FAL20 | Dissolved | Water | 6010C | 643956 |
| 680-191377-8 MSD | SHM-10-07-FAL20 | Dissolved | Water | 6010C | 643956 |

## General Chemistry

### Analysis Batch: 517299

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-3 | SHL-8D-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191377-4 | SHL-8S-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191377-6 | SHM-10-02-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191377-7 | SHM-10-03-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191377-8 | SHM-10-07-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191377-9 | SHM-10-08-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191377-10 | SHM-10-14-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191377-11 | SHM-13-08-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-517299/31 | Method Blank | Total/NA | Water | SM 2320B | |
| MB 280-517299/57 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-517299/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| LCS 280-517299/56 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Analysis Batch: 518157

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-4 | SHL-8S-FAL20 | Dissolved | Water | 9060A | |
| MB 280-518157/36 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-518157/35 | Lab Control Sample | Dissolved | Water | 9060A | |

### Analysis Batch: 518567

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-1 | EPA-PZ-2012-5A-FAL20 | Dissolved | Water | 9060A | |
| 680-191377-2 | EPA-PZ-2012-5B-FAL20 | Dissolved | Water | 9060A | |
| 680-191377-3 | SHL-8D-FAL20 | Dissolved | Water | 9060A | |

## General Chemistry (Continued)

### Analysis Batch: 518567 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-5 | SHL-DUP08-FAL20 | Dissolved | Water | 9060A | |
| 680-191377-6 | SHM-10-02-FAL20 | Dissolved | Water | 9060A | |
| 680-191377-7 | SHM-10-03-FAL20 | Dissolved | Water | 9060A | |
| 680-191377-8 | SHM-10-07-FAL20 | Dissolved | Water | 9060A | |
| 680-191377-9 | SHM-10-08-FAL20 | Dissolved | Water | 9060A | |
| 680-191377-10 | SHM-10-14-FAL20 | Dissolved | Water | 9060A | |
| 680-191377-11 | SHM-13-08-FAL20 | Dissolved | Water | 9060A | |
| 680-191377-12 | SHM-96-5B-FAL20 | Dissolved | Water | 9060A | |
| 680-191377-13 | SHM-96-5C-FAL20 | Dissolved | Water | 9060A | |
| MB 280-518567/35 | Method Blank | Dissolved | Water | 9060A | |
| MB 280-518567/4 | Method Blank | Dissolved | Water | 9060A | |
| MB 280-518567/68 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-518567/3 | Lab Control Sample | Dissolved | Water | 9060A | |
| LCS 280-518567/34 | Lab Control Sample | Dissolved | Water | 9060A | |
| LCS 280-518567/67 | Lab Control Sample | Dissolved | Water | 9060A | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

## Client Sample ID: EPA-PZ-2012-5A-FAL20

**Lab Sample ID: 680-191377-1**

**Date Collected: 11/10/20 12:10**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518567 | 11/25/20 23:42 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |

## Client Sample ID: EPA-PZ-2012-5B-FAL20

**Lab Sample ID: 680-191377-2**

**Date Collected: 11/10/20 13:10**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518567 | 11/25/20 23:59 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |

## Client Sample ID: SHL-8D-FAL20

**Lab Sample ID: 680-191377-3**

**Date Collected: 11/10/20 14:35**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644575 | 11/18/20 22:26 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643956 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 19:27 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643927 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644041 | 11/13/20 21:35 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518567 | 11/26/20 00:16 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 16:31 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHL-8S-FAL20

**Lab Sample ID: 680-191377-4**

**Date Collected: 11/10/20 15:35**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644575 | 11/18/20 22:39 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643956 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 19:22 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643927 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644041 | 11/13/20 21:32 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518157 | 11/25/20 04:03 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 16:35 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

## Client Sample ID: SHL-DUP08-FAL20

**Lab Sample ID: 680-191377-5**

**Date Collected: 11/10/20 09:45**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518567 | 11/26/20 00:33 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |

## Client Sample ID: SHM-10-02-FAL20

**Lab Sample ID: 680-191377-6**

**Date Collected: 11/10/20 12:00**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644575 | 11/18/20 23:04 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643956 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 19:01 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643927 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644041 | 11/13/20 21:07 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518567 | 11/26/20 01:20 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 16:47 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-10-03-FAL20

**Lab Sample ID: 680-191377-7**

**Date Collected: 11/10/20 13:40**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644575 | 11/18/20 23:17 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643956 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 19:12 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643927 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644041 | 11/13/20 21:13 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518567 | 11/26/20 01:37 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 16:53 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-10-07-FAL20

**Lab Sample ID: 680-191377-8**

**Date Collected: 11/10/20 16:20**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644575 | 11/18/20 23:30 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

## Client Sample ID: SHM-10-07-FAL20

**Lab Sample ID: 680-191377-8**

**Date Collected: 11/10/20 16:20**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643956 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 18:25 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643927 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644041 | 11/13/20 20:52 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518567 | 11/26/20 01:54 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 16:58 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-10-08-FAL20

**Lab Sample ID: 680-191377-9**

**Date Collected: 11/10/20 10:25**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644575 | 11/18/20 23:42 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643956 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 19:17 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643927 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644041 | 11/13/20 21:23 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518567 | 11/26/20 02:11 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 17:05 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-10-14-FAL20

**Lab Sample ID: 680-191377-10**

**Date Collected: 11/10/20 12:25**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644575 | 11/18/20 23:55 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643956 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 19:06 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643927 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644041 | 11/13/20 21:10 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518567 | 11/26/20 02:28 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

## Client Sample ID: SHM-10-14-FAL20

**Lab Sample ID: 680-191377-10**

**Date Collected: 11/10/20 12:25**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 17:11 | RAF | TAL DEN |

## Client Sample ID: SHM-13-08-FAL20

**Lab Sample ID: 680-191377-11**

**Date Collected: 11/10/20 16:05**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644575 | 11/19/20 00:07 | T1C | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 643956 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 19:32 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 643927 | 11/13/20 13:18 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644041 | 11/13/20 21:38 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518567 | 11/26/20 03:30 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 17:17 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-96-5B-FAL20

**Lab Sample ID: 680-191377-12**

**Date Collected: 11/10/20 09:40**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518567 | 11/26/20 03:47 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |

## Client Sample ID: SHM-96-5C-FAL20

**Lab Sample ID: 680-191377-13**

**Date Collected: 11/10/20 10:50**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518567 | 11/26/20 04:34 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

## Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| ANAB | Dept. of Defense ELAP | L2463 | 09-22-22 |

## Laboratory: Eurofins TestAmerica, Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| A2LA | Dept. of Defense ELAP | 2907.01 | 10-31-21 |

# Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060A | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | TAL SAV |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-191377 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | | | | | | |
| 1 | EPA-PZ-2012-1A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-1A | N1 | 23.70 | 28.70 | | |
| 2 | EPA-PZ-2012-1B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-1B | N1 | 73.56 | 78.56 | | |
| 3 | EPA-PZ-2012-2A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-2A | N1 | 18.14 | 23.14 | | |
| 4 | EPA-PZ-2012-2B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-2B | N1 | 73.16 | 78.16 | | |
| 5 | EPA-PZ-2012-3A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-3A | N1 | 19.09 | 24.09 | | |
| 6 | EPA-PZ-2012-3B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-3B | N1 | 68.70 | 73.70 | | |
| 7 | EPA-PZ-2012-4A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-4A | N1 | 19.56 | 24.56 | | |
| 8 | EPA-PZ-2012-4B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-4B | N1 | 79.50 | 84.50 | | |
| 9 | EPA-PZ-2012-5A-FAL20 | WG | 11-10-20 | 1210 | CR | X | X | X | X | X | | | | | | EPA-PZ-2012-5A | N1 | 17.95 | 22.95 | | |
| 10 | EPA-PZ-2012-5B-FAL20 | WG | 11-10-20 | 1310 | CR | X | X | X | X | X | | | | | | EPA-PZ-2012-5B | N1 | 68.46 | 73.46 | | |
| 11 | EPA-PZ-2012-6A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-6A | N1 | 24.19 | 29.19 | | |
| 12 | EPA-PZ-2012-6B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-6B | N1 | 74.23 | 79.23 | | |
| 13 | EPA-PZ-2012-7A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-7A | N1 | 23.87 | 28.87 | | |
| 14 | EPA-PZ-2012-7B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-7B | N1 | 58.82 | 63.82 | | |
| 15 | EW-01-FAL20 | WG | | | | X | X | X | X | X | | | | | | EW-01 | N1 | 60.00 | 85.00 | | |
| 16 | EW-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | EW-04 | N1 | 70.00 | 95.00 | | |
| 17 | N5-P1-FAL20 | WG | | | | X | X | X | X | X | | | | | | N5-P1 | N1 | 95.50 | 97.50 | | |
| 18 | PZ-12-01-FAL20 | WG | | | | X | X | X | X | X | | | | | | PZ-12-01 | N1 | 24.00 | 34.00 | | |

**Relinquished by:** D Campbell
**Date** 11/10/20
**Time** 17:35
Received by: [signature]
SHL_eCOC

**Date** 11/11/20 ETA
**Time**
**Shipping Date:**
Received by Laboratory: [signature] 11-12-20 0910
Condition: 4.5 (CF) 4.8°C

# ..-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| **3** | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| **5** | 1x 125mL plastic, Cool < 6degC |
| **9** | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| **46** | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **46** | **9** | **9** | **5** | **3** | | | | | | |
| 37 | SHL-23-FAL20 | WG | | | | X | X | X | X | X | SHL-23 | N1 | 23.00 | 33.00 | | |
| 38 | SHL-24-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | N1 | 110.00 | 120.00 | | |
| 39 | SHL-3-FAL20 | WG | | | | X | X | X | X | X | SHL-3 | N1 | 24.00 | 34.00 | | |
| 40 | SHL-4-FAL20 | WG | | | | X | X | X | X | X | SHL-4 | N1 | 3.00 | 13.00 | | |
| 41 | SHL-5-FAL20 | WG | | | | X | X | X | X | X | SHL-5 | N1 | 3.00 | 13.00 | | |
| 42 | SHL-7-FAL20 | WG | | | | X | X | X | X | X | SHL-7 | N1 | 11.00 | 21.00 | | |
| 43 | SHL-8D-FAL20 | WG | 11-10-20 | 1435 | CR | X | X | X | X | X | SHL-8D | N1 | 68.00 | 70.00 | | |
| 44 | SHL-8S-FAL20 | WG | 11-10-20 | 1535 | CR | X | X | X | X | X | SHL-8S | N1 | 52.00 | 54.00 | | |
| 45 | SHL-9-FAL20 | WG | | | | X | X | X | X | X | SHL-9 | N1 | 15.00 | 25.00 | | |
| 46 | SHL-DUP01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | FD1 | 25.00 | 35.00 | | |
| 47 | SHL-DUP02-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | FD1 | 39.00 | 49.00 | | |
| 48 | SHL-DUP03-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | FD1 | 25.00 | 35.00 | | |
| 49 | SHL-DUP04-FAL20 | WG | | | | X | X | X | X | X | SHP-01-38A | FD1 | 1.50 | 6.50 | | |
| 50 | SHL-DUP05-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | FD1 | 22.00 | 32.00 | | |
| 51 | SHL-DUP06-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | FD1 | 79.50 | 84.50 | | |
| 52 | SHL-DUP07-FAL20 | WG | | | | X | X | X | X | X | SHL-22 | FD1 | 105.00 | 115.00 | | |
| 53 | SHL-DUP08-FAL20 | WG | 11-10-20 | 945 | CR | X | X | X | X | X | SHM-96-5B | FD1 | 80.00 | 90.00 | | |
| 53 | SHL-DUP09-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | FD1 | 110.00 | 120.00 | | |

**Relinquished by:** Diane Clupper
**Date**
**Time**
Received by: 11/10/20 17:35
SHL_eCOC

**Date** 11/11/20 1700 ETA
**Time**
**Shipping Date:**
Received by Laboratory: 11-12-20 0910
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 53 | SHL-DUP10-FAL20 | WG | | | | X | X | X | X | X | SHM-05-40X | FD1 | 32.00 | 34.00 | | |
| 54 | SHM-05-39A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-39A | N1 | 37.00 | 39.00 | | |
| 55 | SHM-05-39B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-39B | N1 | 66.00 | 68.00 | | |
| 56 | SHM-05-40X-FAL20 | WG | | | | X | X | X | X | X | SHM-05-40X | N1 | 32.00 | 34.00 | | |
| 57 | SHM-05-41A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41A | N1 | 42.00 | 44.00 | | |
| 58 | SHM-05-41B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41B | N1 | 62.00 | 64.00 | | |
| 59 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | MS1 | 88.00 | 93.00 | | |
| 60 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | N1 | 88.00 | 93.00 | | |
| 61 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | SD1 | 88.00 | 93.00 | | |
| 62 | SHM-05-42A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-42A | N1 | 40.00 | 42.00 | | |
| 63 | SHM-05-42B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-42B | N1 | 70.00 | 72.00 | | |
| 64 | SHM-07-03-FAL20 | WG | | | | X | X | X | X | X | SHM-07-03 | N1 | 25.00 | 35.00 | | |
| 65 | SHM-07-05X-FAL20 | WG | | | | X | X | X | X | X | SHM-07-05X | N1 | 55.00 | 65.00 | | |
| 66 | SHM-10-02-FAL20 | WG | 11-10-20 | 1200 | DB | X | X | X | X | X | SHM-10-02 | N1 | 53.00 | 63.00 | | |
| 67 | SHM-10-03-FAL20 | WG | 11-10-20 | 1340 | DB | X | X | X | X | X | SHM-10-03 | N1 | 58.50 | 68.50 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | MS1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | N1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | SD1 | 55.00 | 65.00 | | |

**Relinquished by:** [signature]
**Date**
**Time**
Received by: 11/10/20 17:35 [signature]
SHL_eCOC

**Date** 11/11/20 ETA
**Time**
**Shipping Date:**
Received by Laboratory: [signature] 11-12-20 0910
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | | | | | | |
| 69 | SHM-10-05A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-05A | N1 | 50.00 | 60.00 | | |
| 70 | SHM-10-06-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-06 | N1 | 69.50 | 79.50 | | |
| 71 | SHM-10-06A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-06A | N1 | 77.00 | 87.00 | | |
| 72 | SHM-10-07-FAL20 | WG | 11-10-20 | 1620 | DC | X | X | X | X | X | | | | | | SHM-10-07 | N1 | 40.00 | 50.00 | | |
| 73 | SHM-10-08-FAL20 | WG | 11-10-20 | 1025 | DB | X | X | X | X | X | | | | | | SHM-10-08 | N1 | 46.00 | 56.00 | | |
| 74 | SHM-10-10-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-10 | N1 | 56.00 | 66.00 | | |
| 75 | SHM-10-11-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-11 | N1 | 50.00 | 60.00 | | |
| 76 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-12 | MS1 | 45.00 | 55.00 | | |
| 77 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-12 | N1 | 45.00 | 55.00 | | |
| 78 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-12 | SD1 | 45.00 | 55.00 | | |
| 79 | SHM-10-13-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-13 | N1 | 60.00 | 70.00 | | |
| 80 | SHM-10-14-FAL20 | WG | 11-10-20 | 1225 | DC | X | X | X | X | X | | | | | | SHM-10-14 | N1 | 60.00 | 80.00 | | |
| 81 | SHM-10-15-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-15 | N1 | 45.00 | 55.00 | | |
| 82 | SHM-10-16-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-16 | N1 | 75.00 | 85.00 | | |
| 83 | SHM-11-02-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-11-02 | N1 | 52.00 | 66.00 | | |
| 84 | SHM-11-06-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-11-06 | N1 | 25.00 | 35.00 | | |
| 85 | SHM-13-01-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-01 | N1 | 39.00 | 49.00 | | |
| 86 | SHM-13-02-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-02 | N1 | 60.00 | 70.00 | | |

**Relinquished by:** DC
**Date** 11/10/20
**Time** 17:35
Received by: Pik
SHL_eCOC

**Date** 11/11/20 ETA
**Time**
**Shipping Date:**
Received by Laboratory: CBarnda 11-12-20 0910
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Analytical Test Method** | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 87 | SHM-13-03-FAL20 | WG | | | | X | X | X | X | X | SHM-13-03 | N1 | 42.00 | 52.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | MS1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | N1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | SD1 | 20.00 | 30.00 | | |
| 89 | SHM-13-05-FAL20 | WG | | | | X | X | X | X | X | SHM-13-05 | N1 | 75.00 | 85.00 | | |
| 90 | SHM-13-06-FAL20 | WG | | | | X | X | X | X | X | SHM-13-06 | N1 | 36.00 | 46.00 | | |
| 91 | SHM-13-07-FAL20 | WG | | | | X | X | X | X | X | SHM-13-07 | N1 | 27.00 | 37.00 | | |
| 92 | SHM-13-08-FAL20 | WG | 11-10-20 | 1605 | DB | X | X | X | X | X | SHM-13-08 | N1 | 55.00 | 65.00 | | |
| 93 | SHM-13-14D-FAL20 | WG | | | | X | X | X | X | X | SHM-13-14D | N1 | 45.00 | 55.00 | | |
| 94 | SHM-13-14S-FAL20 | WG | | | | X | X | X | X | X | SHM-13-14S | N1 | 5.00 | 15.00 | | |
| 95 | SHM-13-15-FAL20 | WG | | | | X | X | X | X | X | SHM-13-15 | N1 | 50.00 | 60.00 | | |
| 96 | SHM-93-10D-FAL20 | WG | | | | X | X | X | X | X | SHM-93-10D | N1 | 48.70 | 58.70 | | |
| 97 | SHM-93-18B-FAL20 | WG | | | | X | X | X | X | X | SHM-93-18B | N1 | 78.50 | 88.50 | | |
| 98 | SHM-93-22B-FAL20 | WG | | | | X | X | X | X | X | SHM-93-22B | N1 | 82.30 | 92.30 | | |
| 99 | SHM-93-22C-FAL20 | WG | | | | X | X | X | X | X | SHM-93-22C | N1 | 124.30 | 134.30 | | |
| 100 | SHM-93-24A-FAL20 | WG | | | | X | X | X | X | X | SHM-93-24A | N1 | 13.20 | 23.20 | | |
| 101 | SHM-96-5B-FAL20 | WG | 11-10-20 | 940 | CR | X | X | X | X | X | SHM-96-5B | N1 | 80.00 | 90.00 | | |
| 102 | SHM-96-5C-FAL20 | WG | 11-10-20 | 1050 | CR | X | X | X | X | X | SHM-96-5C | N1 | 50.00 | 60.00 | | |

**Relinquished by:** DCheps
**Date** 11/10/20
**Time** 17:35
Received by: SHL_eCOC

**Date** 11/11/20
**Time** 1700 ETA
**Shipping Date:**
Received by Laboratory: 11-12-20 0910
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478 0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| Project Name: Former Fort Devens, Long Term Monitoring | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| Project Number: DEVENS-LTM | Contact: | |
| WBS Code: | Ship to: | |

Comments:
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = CLSO4
SW9060A/FLDFLT (B) = DOC

Boston
#215

Equipment:

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL, plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-191377 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 1 | EPA-PZ-2012-1A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-1A | N1 | 23.70 | 28.70 | | |
| 2 | EPA-PZ-2012-1B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-1B | N1 | 73.56 | 78.56 | | |
| 3 | EPA-PZ-2012-2A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-2A | N1 | 18.14 | 23.14 | | |
| 4 | EPA-PZ-2012-2B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-2B | N1 | 73.16 | 78.16 | | |
| 5 | EPA-PZ-2012-3A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-3A | N1 | 19.09 | 24.09 | | |
| 6 | EPA-PZ-2012-3B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-3B | N1 | 68.70 | 73.70 | | |
| 7 | EPA-PZ-2012-4A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4A | N1 | 19.56 | 24.56 | | |
| 8 | EPA-PZ-2012-4B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | N1 | 79.50 | 84.50 | | |
| 9 | EPA-PZ-2012-5A-FAL20 | WG | 11-10-20 | 1210 | CR | X | X | X | X | X | EPA-PZ-2012-5A | N1 | 17.95 | 22.95 | | |
| 10 | EPA-PZ-2012-5B-FAL20 | WG | 11-10-20 | 1310 | CR | X | X | X | X | X | EPA-PZ-2012-5B | N1 | 68.46 | 73.46 | | |
| 11 | EPA-PZ-2012-6A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-6A | N1 | 24.19 | 29.19 | | |
| 12 | EPA-PZ-2012-6B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-6B | N1 | 74.23 | 79.23 | | |
| 13 | EPA-PZ-2012-7A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-7A | N1 | 23.87 | 28.87 | | |
| 14 | EPA-PZ-2012-7B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-7B | N1 | 58.82 | 63.82 | | |
| 15 | EW-01-FAL20 | WG | | | | X | X | X | X | X | EW-01 | N1 | 80.00 | 85.00 | | |
| 16 | EW-04-FAL20 | WG | | | | X | X | X | X | X | EW-04 | N1 | 70.00 | 95.00 | | |
| 17 | N5-P1-FAL20 | WG | | | | X | X | X | X | X | N5-P1 | N1 | 95.50 | 97.50 | | |
| 18 | PZ-12-01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-01 | N1 | 24.00 | 34.00 | | |

Relinquished by: D Chapsz
Date
Time 11/10/20 17:35
Received by

Date 11/11/20 ETA
Time
Shipping Date:
Received by Laboratory
Condition

Banda 11-12-20 0910
4.5 (CF) 4.8°C

Banda 11-13-20 0930 3.3 (CF) 3.6°C

## .. OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478 0336, jennifer singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston
#215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 37 | SHL-23-FAL20 | WG | | | | X | X | X | X | X | SHL-23 | N1 | 23.00 | 33.00 | | |
| 38 | SHL-24-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | N1 | 110.00 | 120.00 | | |
| 39 | SHL-3-FAL20 | WG | | | | X | X | X | X | X | SHL-3 | N1 | 24.00 | 34.00 | | |
| 40 | SHL-4-FAL20 | WG | | | | X | X | X | X | X | SHL-4 | N1 | 3.00 | 13.00 | | |
| 41 | SHL-5-FAL20 | WG | | | | X | X | X | X | X | SHL-5 | N1 | 3.00 | 13.00 | | |
| 42 | SHL-7-FAL20 | WG | | | | X | X | X | X | X | SHL-7 | N1 | 11.00 | 21.00 | | |
| 43 | SHL-8D-FAL20 | WG | 11-10-20 | 1435 | CR | X | X | X | X | X | SHL-8D | N1 | 68.00 | 70.00 | | |
| 44 | SHL-8S-FAL20 | WG | 11-10-20 | 1535 | CR | X | X | X | X | X | SHL-8S | N1 | 52.00 | 54.00 | | |
| 45 | SHL-9-FAL20 | WG | | | | X | X | X | X | X | SHL-9 | N1 | 15.00 | 25.00 | | |
| 46 | SHL-DUP01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | FD1 | 25.00 | 35.00 | | |
| 47 | SHL-DUP02-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | FD1 | 39.00 | 49.00 | | |
| 48 | SHL-DUP03-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | FD1 | 25.00 | 35.00 | | |
| 49 | SHL-DUP04-FAL20 | WG | | | | X | X | X | X | X | SHP-01-38A | FD1 | 1.50 | 6.50 | | |
| 50 | SHL-DUP05-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | FD1 | 22.00 | 32.00 | | |
| 51 | SHL-DUP06-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | FD1 | 79.50 | 84.50 | | |
| 52 | SHL-DUP07-FAL20 | WG | | | | X | X | X | X | X | SHL-22 | FD1 | 105.00 | 115.00 | | |
| 53 | SHL-DUP08-FAL20 | WG | 11-10-20 | 945 | CR | X | X | X | X | X | SHM-98-5B | FD1 | 80.00 | 90.00 | | |
| 53 | SHL-DUP09-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | FD1 | 110.00 | 120.00 | | |

**Relinquished by:** Drane Dupgo
Date
Time
Received by: 11/10/20 17:35 [signature]

**Date** [signature] 11/11/20 1700 ETA
Time
**Shipping Date:**
Received by Laboratory
Condition: [signature] 11-12-20 0910

[signature] 11-13-20 0930 33(F)36°C

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
689 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478 0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| Project Name: Former Fort Devens, Long Term Monitoring | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| Project Number: DEVENS-LTM | Contact: | |
| WBS Code: | Ship to: | |

Comments:
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

Equipment:

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL, plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 53 | SHL-DUP10-FAL20 | WG | | | | X | X | X | X | X | SHM-05-40X | FD1 | 32.00 | 34.00 | | |
| 54 | SHM-05-39A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-39A | N1 | 37.00 | 39.00 | | |
| 55 | SHM-05-39B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-39B | N1 | 66.00 | 68.00 | | |
| 56 | SHM-05-40X-FAL20 | WG | | | | X | X | X | X | X | SHM-05-40X | N1 | 32.00 | 34.00 | | |
| 57 | SHM-05-41A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41A | N1 | 42.00 | 44.00 | | |
| 58 | SHM-05-41B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41B | N1 | 62.00 | 64.00 | | |
| 59 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | MS1 | 88.00 | 93.00 | | |
| 60 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | N1 | 88.00 | 93.00 | | |
| 61 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | SD1 | 88.00 | 93.00 | | |
| 62 | SHM-05-42A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-42A | N1 | 40.00 | 42.00 | | |
| 63 | SHM-05-42B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-42B | N1 | 70.00 | 72.00 | | |
| 64 | SHM-07-03-FAL20 | WG | | | | X | X | X | X | X | SHM-07-03 | N1 | 25.00 | 35.00 | | |
| 65 | SHM-07-05X-FAL20 | WG | | | | X | X | X | X | X | SHM-07-05X | N1 | 55.00 | 65.00 | | |
| 66 | SHM-10-02-FAL20 | WG | 11-10-20 | 1200 | DB | X | X | X | X | X | SHM-10-02 | N1 | 53.00 | 63.00 | | |
| 67 | SHM-10-03-FAL20 | WG | 11-10-20 | 1240 | DB | X | X | X | X | X | SHM-10-03 | N1 | 58.50 | 68.50 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | MS1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | N1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | SD1 | 55.00 | 65.00 | | |

Relinquished by: [illegible]
Date
Time
Received by: 11/10/20 17:35 [illegible]
SHL_COC

Date 11/11/20 ETA
Time
Shipping Date:
Received by Laboratory: [illegible] 11-12-20 0910
Condition

11-13-20 0930 3.3(CF) 3.6C

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478 0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston
#215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 69 | SHM-10-05A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-05A | N1 | 50.00 | 60.00 | | |
| 70 | SHM-10-06-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06 | N1 | 69.50 | 79.50 | | |
| 71 | SHM-10-06A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06A | N1 | 77.00 | 87.00 | | |
| 72 | SHM-10-07-FAL20 | WG | 11-10-20 | 1620 | DC | X | X | X | X | X | SHM-10-07 | N1 | 40.00 | 50.00 | | |
| 73 | SHM-10-08-FAL20 | WG | 11-10-20 | 1025 | DB | X | X | X | X | X | SHM-10-08 | N1 | 46.00 | 56.00 | | |
| 74 | SHM-10-10-FAL20 | WG | | | | X | X | X | X | X | SHM-10-10 | N1 | 56.00 | 66.00 | | |
| 75 | SHM-10-11-FAL20 | WG | | | | X | X | X | X | X | SHM-10-11 | N1 | 50.00 | 60.00 | | |
| 76 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | MS1 | 45.00 | 55.00 | | |
| 77 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | N1 | 45.00 | 55.00 | | |
| 78 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | SD1 | 45.00 | 55.00 | | |
| 79 | SHM-10-13-FAL20 | WG | | | | X | X | X | X | X | SHM-10-13 | N1 | 60.00 | 70.00 | | |
| 80 | SHM-10-14-FAL20 | WG | 11-10-20 | 1225 | DC | X | X | X | X | X | SHM-10-14 | N1 | 60.00 | 80.00 | | |
| 81 | SHM-10-15-FAL20 | WG | | | | X | X | X | X | X | SHM-10-15 | N1 | 45.00 | 55.00 | | |
| 82 | SHM-10-16-FAL20 | WG | | | | X | X | X | X | X | SHM-10-16 | N1 | 75.00 | 85.00 | | |
| 83 | SHM-11-02-FAL20 | WG | | | | X | X | X | X | X | SHM-11-02 | N1 | 52.00 | 66.00 | | |
| 84 | SHM-11-06-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | N1 | 25.00 | 35.00 | | |
| 85 | SHM-13-01-FAL20 | WG | | | | X | X | X | X | X | SHM-13-01 | N1 | 39.00 | 49.00 | | |
| 86 | SHM-13-02-FAL20 | WG | | | | X | X | X | X | X | SHM-13-02 | N1 | 60.00 | 70.00 | | |

**Relinquished by:** DC
**Date**
**Time**
**Received by** SHL, eCOC
11/10/20 17:35 [signature]

**Date**
**Time**
**Shipping Date:**
**Received by Laboratory Condition**
[signature] 11/11/20 ETA
[signature] 11-12-20 0910

[signature] 11-13-20 0930 3.3(CF) 3.6

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478 0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| Project Name: Former Fort Devens, Long Term Monitoring | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| Project Number: DEVENS-LTM | Contact: | |
| WBS Code: | Ship to: | |

Comments:
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston
#215

Equipment:

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL, plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 87 | SHM-13-03-FAL20 | WG | | | | X | X | X | X | X | SHM-13-03 | N1 | 42.00 | 52.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | MS1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | N1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | SD1 | 20.00 | 30.00 | | |
| 89 | SHM-13-05-FAL20 | WG | | | | X | X | X | X | X | SHM-13-05 | N1 | 75.00 | 85.00 | | |
| 90 | SHM-13-06-FAL20 | WG | | | | X | X | X | X | X | SHM-13-06 | N1 | 36.00 | 46.00 | | |
| 91 | SHM-13-07-FAL20 | WG | | | | X | X | X | X | X | SHM-13-07 | N1 | 27.00 | 37.00 | | |
| 92 | SHM-13-08-FAL20 | WG | 11-10-20 | 1605 | DB | X | X | X | X | X | SHM-13-08 | N1 | 55.00 | 65.00 | | |
| 93 | SHM-13-14D-FAL20 | WG | | | | X | X | X | X | X | SHM-13-14D | N1 | 45.00 | 55.00 | | |
| 94 | SHM-13-14S-FAL20 | WG | | | | X | X | X | X | X | SHM-13-14S | N1 | 5.00 | 15.00 | | |
| 95 | SHM-13-15-FAL20 | WG | | | | X | X | X | X | X | SHM-13-15 | N1 | 50.00 | 60.00 | | |
| 96 | SHM-93-10D-FAL20 | WG | | | | X | X | X | X | X | SHM-93-10D | N1 | 48.70 | 58.70 | | |
| 97 | SHM-93-18B-FAL20 | WG | | | | X | X | X | X | X | SHM-93-18B | N1 | 78.50 | 88.50 | | |
| 98 | SHM-93-22B-FAL20 | WG | | | | X | X | X | X | X | SHM-93-22B | N1 | 82.30 | 92.30 | | |
| 99 | SHM-93-22C-FAL20 | WG | | | | X | X | X | X | X | SHM-93-22C | N1 | 124.30 | 134.30 | | |
| 100 | SHM-93-24A-FAL20 | WG | | | | X | X | X | X | X | SHM-93-24A | N1 | 13.20 | 23.20 | | |
| 101 | SHM-96-5B-FAL20 | WG | 11-10-20 | 940 | CR | X | X | X | X | X | SHM-96-5B | N1 | 80.00 | 90.00 | | |
| 102 | SHM-96-5C-FAL20 | WG | 11-10-20 | 1050 | CR | X | X | X | X | X | SHM-96-5C | N1 | 50.00 | 60.00 | | |

Relinquished by: [signature]
Date
Time
Received by: 11/10/20 17:35 [signature]
SHL_eCOC

Date
Time
Shipping Date: [signature] 11/11/20 1700 ETA
Received by Laboratory Condition: [signature] 11-12-20 0910

[signature] 11-13-20 0930

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-633008.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-191377-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/24/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens - LTM | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SHL-8D-FAL20 (680-191377-3) | 11/10/20 | 14:35 Eastern | | Water | | | X | X | 2 | |
| SHL-8S-FAL20 (680-191377-4) | 11/10/20 | 15:35 Eastern | | Water | | | X | X | 2 | |
| SHM-10-02-FAL20 (680-191377-6) | 11/10/20 | 12:00 Eastern | | Water | | | X | X | 2 | |
| SHM-10-03-FAL20 (680-191377-7) | 11/10/20 | 13:40 Eastern | | Water | | | X | X | 2 | |
| SHM-10-07-FAL20 (680-191377-8) | 11/10/20 | 16:20 Eastern | | Water | | | X | X | 2 | |
| SHM-10-08-FAL20 (680-191377-9) | 11/10/20 | 10:25 Eastern | | Water | | | X | X | 2 | |
| SHM-10-14-FAL20 (680-191377-10) | 11/10/20 | 12:25 Eastern | | Water | | | X | X | 2 | |
| SHM-13-08-FAL20 (680-191377-11) | 11/10/20 | 16:05 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | | | |
|---|---|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | | Method of Shipment: | |
| Relinquished by: | Date/Time: 11-12-2020/1435 | Company | Received by: | Date/Time: 11/14/2020 0915 | Company ETADEW |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | | Cooler Temperature(s) °C and Other Remarks: 1.0 IR11-03 JO 11/14/2020 | | |

Ver: 01/16/2019

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-633257.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-191377-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/24/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens - LTM | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| EPA-PZ-2012-5A-FAL20 (680-191377-1) | 11/10/20 | 12:10 Eastern | | Water | | | X | 2 | |
| EPA-PZ-2012-5B-FAL20 (680-191377-2) | 11/10/20 | 13:10 Eastern | | Water | | | X | 2 | |
| SHL-DUP08-FAL20 (680-191377-5) | 11/10/20 | 09:45 Eastern | | Water | | | X | 2 | |
| SHM-96-5B-FAL20 (680-191377-12) | 11/10/20 | 09:40 Eastern | | Water | | | X | 2 | |
| SHM-96-5C-FAL20 (680-191377-13) | 11/10/20 | 10:50 Eastern | | Water | | | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| | 11-13-2020/1416 | | | 11/14/2020 0915 | EFADEN |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 0.8 IR11-0.3 TO 11/14/2020 |
|---|---|---|

Ver: 01/16/2019

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-633257.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-191377-2 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/24/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens - LTM | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A/ (MOD) Waters - TOC Duplicates | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| EPA-PZ-2012-5A-FAL20 (680-191377-1) | 11/10/20 | 12:10 Eastern | | Water | | | X | X | 2 | |
| EPA-PZ-2012-5B-FAL20 (680-191377-2) | 11/10/20 | 13:10 Eastern | | Water | | | X | X | 2 | |
| SHL-DUP08-FAL20 (680-191377-5) | 11/10/20 | 09:45 Eastern | | Water | | | X | X | 2 | |
| SHM-96-5B-FAL20 (680-191377-12) | 11/10/20 | 09:40 Eastern | | Water | | | X | X | 2 | |
| SHM-96-5C-FAL20 (680-191377-13) | 11/10/20 | 10:50 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | | | |
|---|---|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
| Relinquished by: DW | Date/Time: 11-13-2020/1416 | Company | Received by: [illegible] | Date/Time: 11/14/2020 0915 | Company ETADEN |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | | Cooler Temperature(s) °C and Other Remarks: | | |

Ver: 01/16/2019

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191377-1

**Login Number: 191377**

**List Source: Eurofins TestAmerica, Savannah**

**List Number: 1**

**Creator: Banda, Christy S**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | N/A | |
| There are no discrepancies between the containers received and the COC. | True | Refer to Job Narrative for details. |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191377-1

**Login Number: 191377**
**List Number: 2**
**Creator: O'Hara, Jake F**

**List Source: Eurofins TestAmerica, Denver**
**List Creation: 11/14/20 05:15 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | N/A | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

eurofins | Environment Testing America

# ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-191377-2
Client Project/Site: Fort Devens - LTM

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

*Authorized for release by:*
*11/20/2020 9:26:49 AM*

Kathryn Smith, Client Service Manager
(912)250-0275
Kathy.Smith@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

# Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-2

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

# Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-2

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 680-191377-1 | EPA-PZ-2012-5A-FAL20 | Water | 11/10/20 12:10 | 11/12/20 09:10 | |
| 680-191377-2 | EPA-PZ-2012-5B-FAL20 | Water | 11/10/20 13:10 | 11/12/20 09:10 | |
| 680-191377-5 | SHL-DUP08-FAL20 | Water | 11/10/20 09:45 | 11/12/20 09:10 | |
| 680-191377-12 | SHM-96-5B-FAL20 | Water | 11/10/20 09:40 | 11/12/20 09:10 | |
| 680-191377-13 | SHM-96-5C-FAL20 | Water | 11/10/20 10:50 | 11/12/20 09:10 | |

## Job ID: 680-191377-2

**Laboratory: Eurofins TestAmerica, Savannah**

**Narrative**

# CASE NARRATIVE
# Client: Seres Engineering & Services LLC
# Project: Fort Devens - LTM

## Report Number: 680-191377-2

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 11/12/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.6º C and 4.8º C.

**METALS (ICP) - DISSOLVED**
Samples EPA-PZ-2012-5A-FAL20 (680-191377-1), EPA-PZ-2012-5B-FAL20 (680-191377-2), SHL-DUP08-FAL20 (680-191377-5), SHM-96-5B-FAL20 (680-191377-12) and SHM-96-5C-FAL20 (680-191377-13) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/13/2020 and analyzed on 11/17/2020.

Iron recovered low for the MS/MSD of sample EPA-PZ-2012-5A-FAL20 (680-191377-1) in batch 680-644415.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples EPA-PZ-2012-5A-FAL20 (680-191377-1), EPA-PZ-2012-5B-FAL20 (680-191377-2), SHL-DUP08-FAL20 (680-191377-5), SHM-96-5B-FAL20 (680-191377-12) and SHM-96-5C-FAL20 (680-191377-13) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 11/13/2020 and analyzed on 11/14/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples EPA-PZ-2012-5A-FAL20 (680-191377-1), EPA-PZ-2012-5B-FAL20 (680-191377-2), SHL-DUP08-FAL20 (680-191377-5), SHM-96-5B-FAL20 (680-191377-12) and SHM-96-5C-FAL20 (680-191377-13) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 11/18/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**
Samples EPA-PZ-2012-5A-FAL20 (680-191377-1), EPA-PZ-2012-5B-FAL20 (680-191377-2), SHL-DUP08-FAL20 (680-191377-5), SHM-96-5B-FAL20 (680-191377-12) and SHM-96-5C-FAL20 (680-191377-13) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 11/18/2020 and 11/19/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-2

## Client Sample ID: EPA-PZ-2012-5A-FAL20

**Lab Sample ID: 680-191377-1**
**Date Collected: 11/10/20 12:10**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 15 | | 0.50 | 0.20 | mg/L | | | 11/18/20 20:45 | 1 |
| Sulfate | 4.4 | | 1.0 | 0.40 | mg/L | | | 11/18/20 20:45 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 5800 | J | 50 | 17 | ug/L | | 11/13/20 17:56 | 11/17/20 01:28 | 1 |
| Manganese | 87 | | 10 | 1.0 | ug/L | | 11/13/20 17:56 | 11/17/20 01:28 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/13/20 17:56 | 11/14/20 20:12 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 22 | | 10 | 3.1 | mg/L | | | 11/18/20 16:08 | 1 |

## Client Sample ID: EPA-PZ-2012-5B-FAL20

**Lab Sample ID: 680-191377-2**
**Date Collected: 11/10/20 13:10**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 42 | | 0.50 | 0.20 | mg/L | | | 11/18/20 21:48 | 1 |
| Sulfate | 11 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 21:48 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 230 | | 50 | 17 | ug/L | | 11/13/20 17:56 | 11/17/20 02:15 | 1 |
| Manganese | 9000 | | 10 | 1.0 | ug/L | | 11/13/20 17:56 | 11/17/20 02:15 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2.5 | J | 3.0 | 1.5 | ug/L | | 11/13/20 17:56 | 11/14/20 20:33 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 180 | | 10 | 3.1 | mg/L | | | 11/18/20 16:14 | 1 |

## Client Sample ID: SHL-DUP08-FAL20

**Lab Sample ID: 680-191377-5**
**Date Collected: 11/10/20 09:45**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 35 | | 0.50 | 0.20 | mg/L | | | 11/18/20 22:52 | 1 |
| Sulfate | 16 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 22:52 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 8000 | | 50 | 17 | ug/L | | 11/13/20 17:56 | 11/17/20 01:54 | 1 |
| Manganese | 7900 | | 10 | 1.0 | ug/L | | 11/13/20 17:56 | 11/17/20 01:54 | 1 |

## Client Sample ID: SHL-DUP08-FAL20

**Lab Sample ID: 680-191377-5**
**Date Collected: 11/10/20 09:45**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 640 | | 3.0 | 1.5 | ug/L | | 11/13/20 17:56 | 11/14/20 20:27 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 210 | | 10 | 3.1 | mg/L | | | 11/18/20 16:42 | 1 |

## Client Sample ID: SHM-96-5B-FAL20

**Lab Sample ID: 680-191377-12**
**Date Collected: 11/10/20 09:40**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 35 | | 0.50 | 0.20 | mg/L | | | 11/19/20 00:45 | 1 |
| Sulfate | 16 | M | 1.0 | 0.40 | mg/L | | | 11/19/20 00:45 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 8600 | | 50 | 17 | ug/L | | 11/13/20 17:56 | 11/17/20 02:20 | 1 |
| Manganese | 7900 | | 10 | 1.0 | ug/L | | 11/13/20 17:56 | 11/17/20 02:20 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 720 | | 3.0 | 1.5 | ug/L | | 11/13/20 17:56 | 11/14/20 20:42 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 210 | | 10 | 3.1 | mg/L | | | 11/18/20 17:23 | 1 |

## Client Sample ID: SHM-96-5C-FAL20

**Lab Sample ID: 680-191377-13**
**Date Collected: 11/10/20 10:50**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 31 | | 0.50 | 0.20 | mg/L | | | 11/19/20 01:23 | 1 |
| Sulfate | 6.4 | M | 1.0 | 0.40 | mg/L | | | 11/19/20 01:23 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 7500 | | 50 | 17 | ug/L | | 11/13/20 17:56 | 11/17/20 02:09 | 1 |
| Manganese | 9700 | | 10 | 1.0 | ug/L | | 11/13/20 17:56 | 11/17/20 02:09 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 29 | | 3.0 | 1.5 | ug/L | | 11/13/20 17:56 | 11/14/20 20:30 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | | 10 | 3.1 | mg/L | | | 11/18/20 17:52 | 1 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-2

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-644486/33**
**Matrix: Water**
**Analysis Batch: 644486**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U M | 0.50 | 0.20 | mg/L | | | 11/18/20 14:51 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/18/20 14:51 | 1 |

**Lab Sample ID: LCS 680-644486/34**
**Matrix: Water**
**Analysis Batch: 644486**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.2 | | mg/L | | 102 | 87 - 111 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: LCSD 680-644486/35**
**Matrix: Water**
**Analysis Batch: 644486**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.2 | | mg/L | | 102 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.2 | | mg/L | | 102 | 87 - 112 | 0 | 15 |

**Lab Sample ID: MB 680-644575/63**
**Matrix: Water**
**Analysis Batch: 644575**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U M | 0.50 | 0.20 | mg/L | | | 11/18/20 21:10 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/18/20 21:10 | 1 |

**Lab Sample ID: LCS 680-644575/64**
**Matrix: Water**
**Analysis Batch: 644575**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.1 | | mg/L | | 101 | 87 - 111 |
| Sulfate | 10.0 | 10.0 | | mg/L | | 100 | 87 - 112 |

**Lab Sample ID: LCSD 680-644575/65**
**Matrix: Water**
**Analysis Batch: 644575**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.1 | | mg/L | | 101 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-191377-2 MS**
**Matrix: Water**
**Analysis Batch: 644575**

**Client Sample ID: EPA-PZ-2012-5B-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 42 | | 10.0 | 51.9 | 4 | mg/L | | 102 | 87 - 111 |
| Sulfate | 11 | M | 10.0 | 21.0 | M | mg/L | | 105 | 87 - 112 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-2

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: 680-191377-2 MSD**
**Matrix: Water**
**Analysis Batch: 644575**

**Client Sample ID: EPA-PZ-2012-5B-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 42 | | 10.0 | 52.0 | 4 | mg/L | | 103 | 87 - 111 | 0 | 15 |
| Sulfate | 11 | M | 10.0 | 20.9 | M | mg/L | | 104 | 87 - 112 | 0 | 15 |

**Lab Sample ID: 680-191377-12 MS**
**Matrix: Water**
**Analysis Batch: 644575**

**Client Sample ID: SHM-96-5B-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 35 | | 10.0 | 45.1 | | mg/L | | 105 | 87 - 111 |
| Sulfate | 16 | M | 10.0 | 26.5 | M | mg/L | | 106 | 87 - 112 |

**Lab Sample ID: 680-191377-12 MSD**
**Matrix: Water**
**Analysis Batch: 644575**

**Client Sample ID: SHM-96-5B-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 35 | | 10.0 | 45.2 | | mg/L | | 107 | 87 - 111 | 0 | 15 |
| Sulfate | 16 | M | 10.0 | 26.7 | M | mg/L | | 108 | 87 - 112 | 1 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-644016/1-A**
**Matrix: Water**
**Analysis Batch: 644415**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 644016**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/13/20 17:56 | 11/17/20 01:17 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/13/20 17:56 | 11/17/20 01:17 | 1 |

**Lab Sample ID: LCS 680-644016/2-A**
**Matrix: Water**
**Analysis Batch: 644415**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 644016**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4720 | | ug/L | | 94 | 87 - 115 |
| Manganese | 400 | 375 | | ug/L | | 94 | 90 - 114 |

**Lab Sample ID: 680-191377-1 MS**
**Matrix: Water**
**Analysis Batch: 644415**

**Client Sample ID: EPA-PZ-2012-5A-FAL20**
**Prep Type: Dissolved**
**Prep Batch: 644016**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 5800 | J | 5000 | 10100 | J | ug/L | | 85 | 87 - 115 |
| Manganese | 87 | | 400 | 457 | | ug/L | | 92 | 90 - 114 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 680-191377-1 MSD** — **Client Sample ID: EPA-PZ-2012-5A-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644415** — **Prep Batch: 644016**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 5800 | J | 5000 | 9890 | J | ug/L | | 81 | 87 - 115 | 2 | 20 |
| Manganese | 87 | | 400 | 451 | | ug/L | | 91 | 90 - 114 | 1 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-644015/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 644129** — **Prep Batch: 644015**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/13/20 17:56 | 11/14/20 20:06 | 1 |

**Lab Sample ID: LCS 680-644015/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 644129** — **Prep Batch: 644015**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 92.1 | | ug/L | | 92 | 84 - 116 |

**Lab Sample ID: 680-191377-1 MS** — **Client Sample ID: EPA-PZ-2012-5A-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644129** — **Prep Batch: 644015**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 100 | 92.8 | | ug/L | | 93 | 84 - 116 |

**Lab Sample ID: 680-191377-1 MSD** — **Client Sample ID: EPA-PZ-2012-5A-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644129** — **Prep Batch: 644015**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 100 | 91.9 | | ug/L | | 92 | 84 - 116 | 1 | 20 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-517299/31** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 517299**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/18/20 15:20 | 1 |

**Lab Sample ID: MB 280-517299/57** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 517299**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/18/20 17:46 | 1 |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: LCS 280-517299/30**
**Matrix: Water**
**Analysis Batch: 517299**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 214 | | mg/L | | 107 | 89 - 109 | | |

**Lab Sample ID: LCS 280-517299/56**
**Matrix: Water**
**Analysis Batch: 517299**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 192 | | mg/L | | 96 | 89 - 109 | | |

**Lab Sample ID: 680-191377-13 DU**
**Matrix: Water**
**Analysis Batch: 517299**

**Client Sample ID: SHM-96-5C-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | | | 196 | | mg/L | | | | 0 | 10 |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-2

## HPLC/IC

### Analysis Batch: 644486

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-1 | EPA-PZ-2012-5A-FAL20 | Total/NA | Water | 9056A | |
| MB 680-644486/33 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-644486/34 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-644486/35 | Lab Control Sample Dup | Total/NA | Water | 9056A | |

### Analysis Batch: 644575

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-2 | EPA-PZ-2012-5B-FAL20 | Total/NA | Water | 9056A | |
| 680-191377-5 | SHL-DUP08-FAL20 | Total/NA | Water | 9056A | |
| 680-191377-12 | SHM-96-5B-FAL20 | Total/NA | Water | 9056A | |
| 680-191377-13 | SHM-96-5C-FAL20 | Total/NA | Water | 9056A | |
| MB 680-644575/63 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-644575/64 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-644575/65 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-191377-2 MS | EPA-PZ-2012-5B-FAL20 | Total/NA | Water | 9056A | |
| 680-191377-2 MSD | EPA-PZ-2012-5B-FAL20 | Total/NA | Water | 9056A | |
| 680-191377-12 MS | SHM-96-5B-FAL20 | Total/NA | Water | 9056A | |
| 680-191377-12 MSD | SHM-96-5B-FAL20 | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 644015

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-1 | EPA-PZ-2012-5A-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-2 | EPA-PZ-2012-5B-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-5 | SHL-DUP08-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-12 | SHM-96-5B-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-13 | SHM-96-5C-FAL20 | Dissolved | Water | 3005A | |
| MB 680-644015/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-644015/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191377-1 MS | EPA-PZ-2012-5A-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-1 MSD | EPA-PZ-2012-5A-FAL20 | Dissolved | Water | 3005A | |

### Prep Batch: 644016

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-1 | EPA-PZ-2012-5A-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-2 | EPA-PZ-2012-5B-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-5 | SHL-DUP08-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-12 | SHM-96-5B-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-13 | SHM-96-5C-FAL20 | Dissolved | Water | 3005A | |
| MB 680-644016/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-644016/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191377-1 MS | EPA-PZ-2012-5A-FAL20 | Dissolved | Water | 3005A | |
| 680-191377-1 MSD | EPA-PZ-2012-5A-FAL20 | Dissolved | Water | 3005A | |

### Analysis Batch: 644129

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-1 | EPA-PZ-2012-5A-FAL20 | Dissolved | Water | 6020A | 644015 |
| 680-191377-2 | EPA-PZ-2012-5B-FAL20 | Dissolved | Water | 6020A | 644015 |
| 680-191377-5 | SHL-DUP08-FAL20 | Dissolved | Water | 6020A | 644015 |
| 680-191377-12 | SHM-96-5B-FAL20 | Dissolved | Water | 6020A | 644015 |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-2

## Metals (Continued)

### Analysis Batch: 644129 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-13 | SHM-96-5C-FAL20 | Dissolved | Water | 6020A | 644015 |
| MB 680-644015/1-A | Method Blank | Total Recoverable | Water | 6020A | 644015 |
| LCS 680-644015/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 644015 |
| 680-191377-1 MS | EPA-PZ-2012-5A-FAL20 | Dissolved | Water | 6020A | 644015 |
| 680-191377-1 MSD | EPA-PZ-2012-5A-FAL20 | Dissolved | Water | 6020A | 644015 |

### Analysis Batch: 644415

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-1 | EPA-PZ-2012-5A-FAL20 | Dissolved | Water | 6010C | 644016 |
| 680-191377-2 | EPA-PZ-2012-5B-FAL20 | Dissolved | Water | 6010C | 644016 |
| 680-191377-5 | SHL-DUP08-FAL20 | Dissolved | Water | 6010C | 644016 |
| 680-191377-12 | SHM-96-5B-FAL20 | Dissolved | Water | 6010C | 644016 |
| 680-191377-13 | SHM-96-5C-FAL20 | Dissolved | Water | 6010C | 644016 |
| MB 680-644016/1-A | Method Blank | Total Recoverable | Water | 6010C | 644016 |
| LCS 680-644016/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 644016 |
| 680-191377-1 MS | EPA-PZ-2012-5A-FAL20 | Dissolved | Water | 6010C | 644016 |
| 680-191377-1 MSD | EPA-PZ-2012-5A-FAL20 | Dissolved | Water | 6010C | 644016 |

## General Chemistry

### Analysis Batch: 517299

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191377-1 | EPA-PZ-2012-5A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191377-2 | EPA-PZ-2012-5B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191377-5 | SHL-DUP08-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191377-12 | SHM-96-5B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191377-13 | SHM-96-5C-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-517299/31 | Method Blank | Total/NA | Water | SM 2320B | |
| MB 280-517299/57 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-517299/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| LCS 280-517299/56 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 680-191377-13 DU | SHM-96-5C-FAL20 | Total/NA | Water | SM 2320B | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-2

## Client Sample ID: EPA-PZ-2012-5A-FAL20

**Lab Sample ID: 680-191377-1**
**Date Collected: 11/10/20 12:10**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 20:45 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644016 | 11/13/20 17:56 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 01:28 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644015 | 11/13/20 17:56 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644129 | 11/14/20 20:12 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 16:08 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: EPA-PZ-2012-5B-FAL20

**Lab Sample ID: 680-191377-2**
**Date Collected: 11/10/20 13:10**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644575 | 11/18/20 21:48 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644016 | 11/13/20 17:56 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 02:15 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644015 | 11/13/20 17:56 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644129 | 11/14/20 20:33 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 16:14 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHL-DUP08-FAL20

**Lab Sample ID: 680-191377-5**
**Date Collected: 11/10/20 09:45**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644575 | 11/18/20 22:52 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644016 | 11/13/20 17:56 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 01:54 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644015 | 11/13/20 17:56 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644129 | 11/14/20 20:27 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 16:42 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-2

## Client Sample ID: SHM-96-5B-FAL20

**Lab Sample ID: 680-191377-12**

**Date Collected: 11/10/20 09:40**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644575 | 11/19/20 00:45 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644016 | 11/13/20 17:56 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 02:20 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644015 | 11/13/20 17:56 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644129 | 11/14/20 20:42 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 17:23 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-96-5C-FAL20

**Lab Sample ID: 680-191377-13**

**Date Collected: 11/10/20 10:50**
**Matrix: Water**
**Date Received: 11/12/20 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644575 | 11/19/20 01:23 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644016 | 11/13/20 17:56 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 02:09 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644015 | 11/13/20 17:56 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644129 | 11/14/20 20:30 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 17:52 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-2

## Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| ANAB | Dept. of Defense ELAP | L2463 | 09-22-22 |

## Laboratory: Eurofins TestAmerica, Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| A2LA | Dept. of Defense ELAP | 2907.01 | 10-31-21 |

# Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens - LTM

Job ID: 680-191377-2

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| SM 2320B | Alkalinity | SM | TAL DEN |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | TAL SAV |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-191377 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) 46 | SW6010C/FLDFLT (B) 9 | SW6020A/FLDFLT (B) 9 | SW9056A (A) 5 | SW9060A/FLDFLT (B) 3 | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | EPA-PZ-2012-1A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-1A | N1 | 23.70 | 28.70 | | |
| 2 | EPA-PZ-2012-1B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-1B | N1 | 73.56 | 78.56 | | |
| 3 | EPA-PZ-2012-2A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-2A | N1 | 18.14 | 23.14 | | |
| 4 | EPA-PZ-2012-2B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-2B | N1 | 73.16 | 78.16 | | |
| 5 | EPA-PZ-2012-3A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-3A | N1 | 19.09 | 24.09 | | |
| 6 | EPA-PZ-2012-3B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-3B | N1 | 68.70 | 73.70 | | |
| 7 | EPA-PZ-2012-4A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-4A | N1 | 19.56 | 24.56 | | |
| 8 | EPA-PZ-2012-4B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-4B | N1 | 79.50 | 84.50 | | |
| 9 | EPA-PZ-2012-5A-FAL20 | WG | 11-10-20 | 1210 | CR | X | X | X | X | X | | | | | | EPA-PZ-2012-5A | N1 | 17.95 | 22.95 | | |
| 10 | EPA-PZ-2012-5B-FAL20 | WG | 11-10-20 | 1310 | CR | X | X | X | X | X | | | | | | EPA-PZ-2012-5B | N1 | 68.46 | 73.46 | | |
| 11 | EPA-PZ-2012-6A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-6A | N1 | 24.19 | 29.19 | | |
| 12 | EPA-PZ-2012-6B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-6B | N1 | 74.23 | 79.23 | | |
| 13 | EPA-PZ-2012-7A-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-7A | N1 | 23.87 | 28.87 | | |
| 14 | EPA-PZ-2012-7B-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-7B | N1 | 58.82 | 63.82 | | |
| 15 | EW-01-FAL20 | WG | | | | X | X | X | X | X | | | | | | EW-01 | N1 | 60.00 | 85.00 | | |
| 16 | EW-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | EW-04 | N1 | 70.00 | 95.00 | | |
| 17 | N5-P1-FAL20 | WG | | | | X | X | X | X | X | | | | | | N5-P1 | N1 | 95.50 | 97.50 | | |
| 18 | PZ-12-01-FAL20 | WG | | | | X | X | X | X | X | | | | | | PZ-12-01 | N1 | 24.00 | 34.00 | | |

**Relinquished by:** D Campbell
**Date** 11/10/20
**Time** 17:35
Received by: [signature]
SHL_eCOC

**Date** 11/11/20 ETA
**Time**
**Shipping Date:**
Received by Laboratory: [signature] 11-12-20 0910
Condition: 4.5 (CF) 4.8°C

# ...OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| **3** | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| **5** | 1x 125mL plastic, Cool < 6degC |
| **9** | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| **46** | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 37 | SHL-23-FAL20 | WG | | | | X | X | X | X | X | SHL-23 | N1 | 23.00 | 33.00 | | |
| 38 | SHL-24-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | N1 | 110.00 | 120.00 | | |
| 39 | SHL-3-FAL20 | WG | | | | X | X | X | X | X | SHL-3 | N1 | 24.00 | 34.00 | | |
| 40 | SHL-4-FAL20 | WG | | | | X | X | X | X | X | SHL-4 | N1 | 3.00 | 13.00 | | |
| 41 | SHL-5-FAL20 | WG | | | | X | X | X | X | X | SHL-5 | N1 | 3.00 | 13.00 | | |
| 42 | SHL-7-FAL20 | WG | | | | X | X | X | X | X | SHL-7 | N1 | 11.00 | 21.00 | | |
| 43 | SHL-8D-FAL20 | WG | 11-10-20 | 1435 | CR | X | X | X | X | X | SHL-8D | N1 | 68.00 | 70.00 | | |
| 44 | SHL-8S-FAL20 | WG | 11-10-20 | 1535 | CR | X | X | X | X | X | SHL-8S | N1 | 52.00 | 54.00 | | |
| 45 | SHL-9-FAL20 | WG | | | | X | X | X | X | X | SHL-9 | N1 | 15.00 | 25.00 | | |
| 46 | SHL-DUP01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | FD1 | 25.00 | 35.00 | | |
| 47 | SHL-DUP02-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | FD1 | 39.00 | 49.00 | | |
| 48 | SHL-DUP03-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | FD1 | 25.00 | 35.00 | | |
| 49 | SHL-DUP04-FAL20 | WG | | | | X | X | X | X | X | SHP-01-38A | FD1 | 1.50 | 6.50 | | |
| 50 | SHL-DUP05-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | FD1 | 22.00 | 32.00 | | |
| 51 | SHL-DUP06-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | FD1 | 79.50 | 84.50 | | |
| 52 | SHL-DUP07-FAL20 | WG | | | | X | X | X | X | X | SHL-22 | FD1 | 105.00 | 115.00 | | |
| 53 | SHL-DUP08-FAL20 | WG | 11-10-20 | 945 | CR | X | X | X | X | X | SHM-96-5B | FD1 | 80.00 | 90.00 | | |
| 53 | SHL-DUP09-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | FD1 | 110.00 | 120.00 | | |

**Relinquished by:** Diane Clupper
**Date**
**Time**
Received by: 11/10/20 17:35
SHL_eCOC

**Date** 11/11/20 1700 ETA
**Time**
**Shipping Date:**
Received by Laboratory: 11-12-20 0910
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | | | | | | |
| 53 | SHL-DUP10-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-05-40X | FD1 | 32.00 | 34.00 | | |
| 54 | SHM-05-39A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-05-39A | N1 | 37.00 | 39.00 | | |
| 55 | SHM-05-39B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-05-39B | N1 | 66.00 | 68.00 | | |
| 56 | SHM-05-40X-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-05-40X | N1 | 32.00 | 34.00 | | |
| 57 | SHM-05-41A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-05-41A | N1 | 42.00 | 44.00 | | |
| 58 | SHM-05-41B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-05-41B | N1 | 62.00 | 64.00 | | |
| 59 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-05-41C | MS1 | 88.00 | 93.00 | | |
| 60 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-05-41C | N1 | 88.00 | 93.00 | | |
| 61 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-05-41C | SD1 | 88.00 | 93.00 | | |
| 62 | SHM-05-42A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-05-42A | N1 | 40.00 | 42.00 | | |
| 63 | SHM-05-42B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-05-42B | N1 | 70.00 | 72.00 | | |
| 64 | SHM-07-03-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-07-03 | N1 | 25.00 | 35.00 | | |
| 65 | SHM-07-05X-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-07-05X | N1 | 55.00 | 65.00 | | |
| 66 | SHM-10-02-FAL20 | WG | 11-10-20 | 1200 | DB | X | X | X | X | X | | | | | | SHM-10-02 | N1 | 53.00 | 63.00 | | |
| 67 | SHM-10-03-FAL20 | WG | 11-10-20 | 1340 | DB | X | X | X | X | X | | | | | | SHM-10-03 | N1 | 58.50 | 68.50 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-04 | MS1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-04 | N1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-04 | SD1 | 55.00 | 65.00 | | |

**Relinquished by:** [illegible]
**Date**
**Time**
Received by: 11/10/20 17:35
SHL_eCOC

**Date** 11/11/20 ETA
**Time**
**Shipping Date:**
Received by Laboratory: 11-12-20 0910
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | | | | | | |
| 69 | SHM-10-05A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-05A | N1 | 50.00 | 60.00 | | |
| 70 | SHM-10-06-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-06 | N1 | 69.50 | 79.50 | | |
| 71 | SHM-10-06A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-06A | N1 | 77.00 | 87.00 | | |
| 72 | SHM-10-07-FAL20 | WG | 11-10-20 | 1620 | DC | X | X | X | X | X | | | | | | SHM-10-07 | N1 | 40.00 | 50.00 | | |
| 73 | SHM-10-08-FAL20 | WG | 11-10-20 | 1025 | DB | X | X | X | X | X | | | | | | SHM-10-08 | N1 | 46.00 | 56.00 | | |
| 74 | SHM-10-10-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-10 | N1 | 56.00 | 66.00 | | |
| 75 | SHM-10-11-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-11 | N1 | 50.00 | 60.00 | | |
| 76 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-12 | MS1 | 45.00 | 55.00 | | |
| 77 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-12 | N1 | 45.00 | 55.00 | | |
| 78 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-12 | SD1 | 45.00 | 55.00 | | |
| 79 | SHM-10-13-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-13 | N1 | 60.00 | 70.00 | | |
| 80 | SHM-10-14-FAL20 | WG | 11-10-20 | 1225 | DC | X | X | X | X | X | | | | | | SHM-10-14 | N1 | 60.00 | 80.00 | | |
| 81 | SHM-10-15-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-15 | N1 | 45.00 | 55.00 | | |
| 82 | SHM-10-16-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-16 | N1 | 75.00 | 85.00 | | |
| 83 | SHM-11-02-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-11-02 | N1 | 52.00 | 66.00 | | |
| 84 | SHM-11-06-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-11-06 | N1 | 25.00 | 35.00 | | |
| 85 | SHM-13-01-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-01 | N1 | 39.00 | 49.00 | | |
| 86 | SHM-13-02-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-02 | N1 | 60.00 | 70.00 | | |

**Relinquished by:** DC
**Date** 11/10/20
**Time** 17:35
Received by: Pik
SHL_eCOC

**Date** 11/11/20 ETA
**Time**
**Shipping Date:**
Received by Laboratory: CBarnda 11-12-20 0910
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 87 | SHM-13-03-FAL20 | WG | | | | X | X | X | X | X | SHM-13-03 | N1 | 42.00 | 52.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | MS1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | N1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | SD1 | 20.00 | 30.00 | | |
| 89 | SHM-13-05-FAL20 | WG | | | | X | X | X | X | X | SHM-13-05 | N1 | 75.00 | 85.00 | | |
| 90 | SHM-13-06-FAL20 | WG | | | | X | X | X | X | X | SHM-13-06 | N1 | 36.00 | 46.00 | | |
| 91 | SHM-13-07-FAL20 | WG | | | | X | X | X | X | X | SHM-13-07 | N1 | 27.00 | 37.00 | | |
| 92 | SHM-13-08-FAL20 | WG | 11-10-20 | 1605 | DB | X | X | X | X | X | SHM-13-08 | N1 | 55.00 | 65.00 | | |
| 93 | SHM-13-14D-FAL20 | WG | | | | X | X | X | X | X | SHM-13-14D | N1 | 45.00 | 55.00 | | |
| 94 | SHM-13-14S-FAL20 | WG | | | | X | X | X | X | X | SHM-13-14S | N1 | 5.00 | 15.00 | | |
| 95 | SHM-13-15-FAL20 | WG | | | | X | X | X | X | X | SHM-13-15 | N1 | 50.00 | 60.00 | | |
| 96 | SHM-93-10D-FAL20 | WG | | | | X | X | X | X | X | SHM-93-10D | N1 | 48.70 | 58.70 | | |
| 97 | SHM-93-18B-FAL20 | WG | | | | X | X | X | X | X | SHM-93-18B | N1 | 78.50 | 88.50 | | |
| 98 | SHM-93-22B-FAL20 | WG | | | | X | X | X | X | X | SHM-93-22B | N1 | 82.30 | 92.30 | | |
| 99 | SHM-93-22C-FAL20 | WG | | | | X | X | X | X | X | SHM-93-22C | N1 | 124.30 | 134.30 | | |
| 100 | SHM-93-24A-FAL20 | WG | | | | X | X | X | X | X | SHM-93-24A | N1 | 13.20 | 23.20 | | |
| 101 | SHM-96-5B-FAL20 | WG | 11-10-20 | 940 | CR | X | X | X | X | X | SHM-96-5B | N1 | 80.00 | 90.00 | | |
| 102 | SHM-96-5C-FAL20 | WG | 11-10-20 | 1050 | CR | X | X | X | X | X | SHM-96-5C | N1 | 50.00 | 60.00 | | |

**Relinquished by:** DCheps
**Date** 11/10/20
**Time** 17:35
Received by: SHL_eCOC

**Date** 11/11/20
**Time** 1700 ETA
**Shipping Date:**
Received by Laboratory: 11-12-20 0910
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478 0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| Project Name: Former Fort Devens, Long Term Monitoring | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| Project Number: DEVENS-LTM | Contact: | |
| WBS Code: | Ship to: | |

Comments:
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = CLSO4
SW9060A/FLDFLT (B) = DOC

Boston
#215

Equipment:

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL, plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-191377 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 1 | EPA-PZ-2012-1A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-1A | N1 | 23.70 | 28.70 | | |
| 2 | EPA-PZ-2012-1B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-1B | N1 | 73.56 | 78.56 | | |
| 3 | EPA-PZ-2012-2A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-2A | N1 | 18.14 | 23.14 | | |
| 4 | EPA-PZ-2012-2B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-2B | N1 | 73.16 | 78.16 | | |
| 5 | EPA-PZ-2012-3A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-3A | N1 | 19.09 | 24.09 | | |
| 6 | EPA-PZ-2012-3B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-3B | N1 | 68.70 | 73.70 | | |
| 7 | EPA-PZ-2012-4A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4A | N1 | 19.56 | 24.56 | | |
| 8 | EPA-PZ-2012-4B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | N1 | 79.50 | 84.50 | | |
| 9 | EPA-PZ-2012-5A-FAL20 | WG | 11-10-20 | 1210 | CR | X | X | X | X | X | EPA-PZ-2012-5A | N1 | 17.95 | 22.95 | | |
| 10 | EPA-PZ-2012-5B-FAL20 | WG | 11-10-20 | 1310 | CR | X | X | X | X | X | EPA-PZ-2012-5B | N1 | 68.46 | 73.46 | | |
| 11 | EPA-PZ-2012-6A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-6A | N1 | 24.19 | 29.19 | | |
| 12 | EPA-PZ-2012-6B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-6B | N1 | 74.23 | 79.23 | | |
| 13 | EPA-PZ-2012-7A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-7A | N1 | 23.87 | 28.87 | | |
| 14 | EPA-PZ-2012-7B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-7B | N1 | 58.82 | 63.82 | | |
| 15 | EW-01-FAL20 | WG | | | | X | X | X | X | X | EW-01 | N1 | 80.00 | 85.00 | | |
| 16 | EW-04-FAL20 | WG | | | | X | X | X | X | X | EW-04 | N1 | 70.00 | 95.00 | | |
| 17 | N5-P1-FAL20 | WG | | | | X | X | X | X | X | N5-P1 | N1 | 95.50 | 97.50 | | |
| 18 | PZ-12-01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-01 | N1 | 24.00 | 34.00 | | |

Relinquished by: D Chapsz
Date
Time 11/10/20 17:35
Received by

Date 11/11/20 ETA
Time
Shipping Date:
Received by Laboratory
Condition

Banda 11-12-20 0910
4.5 (CF) 4.8°C

Banda 11-13-20 0930 3.3 (CF) 3.6°C

## .. OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478 0336, jennifer singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston
#215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 37 | SHL-23-FAL20 | WG | | | | X | X | X | X | X | SHL-23 | N1 | 23.00 | 33.00 | | |
| 38 | SHL-24-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | N1 | 110.00 | 120.00 | | |
| 39 | SHL-3-FAL20 | WG | | | | X | X | X | X | X | SHL-3 | N1 | 24.00 | 34.00 | | |
| 40 | SHL-4-FAL20 | WG | | | | X | X | X | X | X | SHL-4 | N1 | 3.00 | 13.00 | | |
| 41 | SHL-5-FAL20 | WG | | | | X | X | X | X | X | SHL-5 | N1 | 3.00 | 13.00 | | |
| 42 | SHL-7-FAL20 | WG | | | | X | X | X | X | X | SHL-7 | N1 | 11.00 | 21.00 | | |
| 43 | SHL-8D-FAL20 | WG | 11-10-20 | 1435 | CR | X | X | X | X | X | SHL-8D | N1 | 68.00 | 70.00 | | |
| 44 | SHL-8S-FAL20 | WG | 11-10-20 | 1535 | CR | X | X | X | X | X | SHL-8S | N1 | 52.00 | 54.00 | | |
| 45 | SHL-9-FAL20 | WG | | | | X | X | X | X | X | SHL-9 | N1 | 15.00 | 25.00 | | |
| 46 | SHL-DUP01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | FD1 | 25.00 | 35.00 | | |
| 47 | SHL-DUP02-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | FD1 | 39.00 | 49.00 | | |
| 48 | SHL-DUP03-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | FD1 | 25.00 | 35.00 | | |
| 49 | SHL-DUP04-FAL20 | WG | | | | X | X | X | X | X | SHP-01-38A | FD1 | 1.50 | 6.50 | | |
| 50 | SHL-DUP05-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | FD1 | 22.00 | 32.00 | | |
| 51 | SHL-DUP06-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | FD1 | 79.50 | 84.50 | | |
| 52 | SHL-DUP07-FAL20 | WG | | | | X | X | X | X | X | SHL-22 | FD1 | 105.00 | 115.00 | | |
| 53 | SHL-DUP08-FAL20 | WG | 11-10-20 | 945 | CR | X | X | X | X | X | SHM-98-5B | FD1 | 80.00 | 90.00 | | |
| 53 | SHL-DUP09-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | FD1 | 110.00 | 120.00 | | |

**Relinquished by:** Drane Dupgo
Date
Time
Received by: 11/10/20 17:35 [signature]

**Date** [signature] 11/11/20 1700 ETA
Time
**Shipping Date:**
Received by Laboratory
Condition: [signature] 11-12-20 0910

[signature] 11-13-20 0930 33(F)36°C

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
689 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478 0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| Project Name: Former Fort Devens, Long Term Monitoring | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| Project Number: DEVENS-LTM | Contact: | |
| WBS Code: | Ship to: | |

Comments:
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston #215

Equipment:

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL, plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 53 | SHL-DUP10-FAL20 | WG | | | | X | X | X | X | X | SHM-05-40X | FD1 | 32.00 | 34.00 | | |
| 54 | SHM-05-39A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-39A | N1 | 37.00 | 39.00 | | |
| 55 | SHM-05-39B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-39B | N1 | 66.00 | 68.00 | | |
| 56 | SHM-05-40X-FAL20 | WG | | | | X | X | X | X | X | SHM-05-40X | N1 | 32.00 | 34.00 | | |
| 57 | SHM-05-41A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41A | N1 | 42.00 | 44.00 | | |
| 58 | SHM-05-41B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41B | N1 | 62.00 | 64.00 | | |
| 59 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | MS1 | 88.00 | 93.00 | | |
| 60 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | N1 | 88.00 | 93.00 | | |
| 61 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | SD1 | 88.00 | 93.00 | | |
| 62 | SHM-05-42A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-42A | N1 | 40.00 | 42.00 | | |
| 63 | SHM-05-42B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-42B | N1 | 70.00 | 72.00 | | |
| 64 | SHM-07-03-FAL20 | WG | | | | X | X | X | X | X | SHM-07-03 | N1 | 25.00 | 35.00 | | |
| 65 | SHM-07-05X-FAL20 | WG | | | | X | X | X | X | X | SHM-07-05X | N1 | 55.00 | 65.00 | | |
| 66 | SHM-10-02-FAL20 | WG | 11-10-20 | 1200 | DB | X | X | X | X | X | SHM-10-02 | N1 | 53.00 | 63.00 | | |
| 67 | SHM-10-03-FAL20 | WG | 11-10-20 | 1240 | DB | X | X | X | X | X | SHM-10-03 | N1 | 58.50 | 68.50 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | MS1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | N1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | SD1 | 55.00 | 65.00 | | |

Relinquished by: [illegible]
Date
Time
Received by: 11/10/20 17:35 [illegible]
SHL_COC

Date 11/11/20 ETA
Time
Shipping Date:
Received by Laboratory: [illegible] 11-12-20 0910
Condition

11-13-20 0930 3.3(CF) 3.6C

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478 0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston
#215

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 69 | SHM-10-05A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-05A | N1 | 50.00 | 60.00 | | |
| 70 | SHM-10-06-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06 | N1 | 69.50 | 79.50 | | |
| 71 | SHM-10-06A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06A | N1 | 77.00 | 87.00 | | |
| 72 | SHM-10-07-FAL20 | WG | 11-10-20 | 1620 | DC | X | X | X | X | X | SHM-10-07 | N1 | 40.00 | 50.00 | | |
| 73 | SHM-10-08-FAL20 | WG | 11-10-20 | 1025 | DB | X | X | X | X | X | SHM-10-08 | N1 | 46.00 | 56.00 | | |
| 74 | SHM-10-10-FAL20 | WG | | | | X | X | X | X | X | SHM-10-10 | N1 | 56.00 | 66.00 | | |
| 75 | SHM-10-11-FAL20 | WG | | | | X | X | X | X | X | SHM-10-11 | N1 | 50.00 | 60.00 | | |
| 76 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | MS1 | 45.00 | 55.00 | | |
| 77 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | N1 | 45.00 | 55.00 | | |
| 78 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | SD1 | 45.00 | 55.00 | | |
| 79 | SHM-10-13-FAL20 | WG | | | | X | X | X | X | X | SHM-10-13 | N1 | 60.00 | 70.00 | | |
| 80 | SHM-10-14-FAL20 | WG | 11-10-20 | 1225 | DC | X | X | X | X | X | SHM-10-14 | N1 | 60.00 | 80.00 | | |
| 81 | SHM-10-15-FAL20 | WG | | | | X | X | X | X | X | SHM-10-15 | N1 | 45.00 | 55.00 | | |
| 82 | SHM-10-16-FAL20 | WG | | | | X | X | X | X | X | SHM-10-16 | N1 | 75.00 | 85.00 | | |
| 83 | SHM-11-02-FAL20 | WG | | | | X | X | X | X | X | SHM-11-02 | N1 | 52.00 | 66.00 | | |
| 84 | SHM-11-06-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | N1 | 25.00 | 35.00 | | |
| 85 | SHM-13-01-FAL20 | WG | | | | X | X | X | X | X | SHM-13-01 | N1 | 39.00 | 49.00 | | |
| 86 | SHM-13-02-FAL20 | WG | | | | X | X | X | X | X | SHM-13-02 | N1 | 60.00 | 70.00 | | |

**Relinquished by:** DC
**Date**
**Time**
**Received by** SHL, eCOC
11/10/20 17:35 [signature]

**Date**
**Time**
**Shipping Date:**
**Received by Laboratory Condition**
[signature] 11/11/20 ETA
[signature] 11-12-20 0910

[signature] 11-13-20 0930 3.3(CF) 3.6

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478 0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| Project Name: Former Fort Devens, Long Term Monitoring | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| Project Number: DEVENS-LTM | Contact: | |
| WBS Code: | Ship to: | |

Comments:
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Boston
#215

Equipment:

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL, plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 87 | SHM-13-03-FAL20 | WG | | | | X | X | X | X | X | SHM-13-03 | N1 | 42.00 | 52.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | MS1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | N1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | SD1 | 20.00 | 30.00 | | |
| 89 | SHM-13-05-FAL20 | WG | | | | X | X | X | X | X | SHM-13-05 | N1 | 75.00 | 85.00 | | |
| 90 | SHM-13-06-FAL20 | WG | | | | X | X | X | X | X | SHM-13-06 | N1 | 36.00 | 46.00 | | |
| 91 | SHM-13-07-FAL20 | WG | | | | X | X | X | X | X | SHM-13-07 | N1 | 27.00 | 37.00 | | |
| 92 | SHM-13-08-FAL20 | WG | 11-10-20 | 1605 | DB | X | X | X | X | X | SHM-13-08 | N1 | 55.00 | 65.00 | | |
| 93 | SHM-13-14D-FAL20 | WG | | | | X | X | X | X | X | SHM-13-14D | N1 | 45.00 | 55.00 | | |
| 94 | SHM-13-14S-FAL20 | WG | | | | X | X | X | X | X | SHM-13-14S | N1 | 5.00 | 15.00 | | |
| 95 | SHM-13-15-FAL20 | WG | | | | X | X | X | X | X | SHM-13-15 | N1 | 50.00 | 60.00 | | |
| 96 | SHM-93-10D-FAL20 | WG | | | | X | X | X | X | X | SHM-93-10D | N1 | 48.70 | 58.70 | | |
| 97 | SHM-93-18B-FAL20 | WG | | | | X | X | X | X | X | SHM-93-18B | N1 | 78.50 | 88.50 | | |
| 98 | SHM-93-22B-FAL20 | WG | | | | X | X | X | X | X | SHM-93-22B | N1 | 82.30 | 92.30 | | |
| 99 | SHM-93-22C-FAL20 | WG | | | | X | X | X | X | X | SHM-93-22C | N1 | 124.30 | 134.30 | | |
| 100 | SHM-93-24A-FAL20 | WG | | | | X | X | X | X | X | SHM-93-24A | N1 | 13.20 | 23.20 | | |
| 101 | SHM-96-5B-FAL20 | WG | 11-10-20 | 940 | CR | X | X | X | X | X | SHM-96-5B | N1 | 80.00 | 90.00 | | |
| 102 | SHM-96-5C-FAL20 | WG | 11-10-20 | 1050 | CR | X | X | X | X | X | SHM-96-5C | N1 | 50.00 | 60.00 | | |

Relinquished by: [signature]
Date
Time
Received by: [signature]
SHL_eCOC
11/10/20 17:35

Date
Time
Shipping Date: [signature] 11/11/20 1700 ETA
Received by Laboratory Condition: [signature] 11-12-20 0910

[signature] 11-13-20 0930

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-633008.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-191377-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/24/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens - LTM | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SHL-8D-FAL20 (680-191377-3) | 11/10/20 | 14:35 Eastern | | Water | | | X | X | 2 | |
| SHL-8S-FAL20 (680-191377-4) | 11/10/20 | 15:35 Eastern | | Water | | | X | X | 2 | |
| SHM-10-02-FAL20 (680-191377-6) | 11/10/20 | 12:00 Eastern | | Water | | | X | X | 2 | |
| SHM-10-03-FAL20 (680-191377-7) | 11/10/20 | 13:40 Eastern | | Water | | | X | X | 2 | |
| SHM-10-07-FAL20 (680-191377-8) | 11/10/20 | 16:20 Eastern | | Water | | | X | X | 2 | |
| SHM-10-08-FAL20 (680-191377-9) | 11/10/20 | 10:25 Eastern | | Water | | | X | X | 2 | |
| SHM-10-14-FAL20 (680-191377-10) | 11/10/20 | 12:25 Eastern | | Water | | | X | X | 2 | |
| SHM-13-08-FAL20 (680-191377-11) | 11/10/20 | 16:05 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | | | |
|---|---|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | | Method of Shipment: | |
| Relinquished by: | Date/Time: 11-12-2020/1435 | Company | Received by: | Date/Time: 11/14/2020 0915 | Company ETADEW |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | | Cooler Temperature(s) °C and Other Remarks: 1.0 IR11-03 JO 11/14/2020 | | |

Ver: 01/16/2019

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-633257.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-191377-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/24/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens - LTM | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| EPA-PZ-2012-5A-FAL20 (680-191377-1) | 11/10/20 | 12:10 Eastern | | Water | | | X | 2 | |
| EPA-PZ-2012-5B-FAL20 (680-191377-2) | 11/10/20 | 13:10 Eastern | | Water | | | X | 2 | |
| SHL-DUP08-FAL20 (680-191377-5) | 11/10/20 | 09:45 Eastern | | Water | | | X | 2 | |
| SHM-96-5B-FAL20 (680-191377-12) | 11/10/20 | 09:40 Eastern | | Water | | | X | 2 | |
| SHM-96-5C-FAL20 (680-191377-13) | 11/10/20 | 10:50 Eastern | | Water | | | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| | 11-13-2020/1416 | | | 11/14/2020 0915 | EFADEN |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 0.8 IR11-0.3 TO 11/14/2020 |
|---|---|---|

Ver: 01/16/2019

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-633257.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-191377-2 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/24/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens - LTM | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A/ (MOD) Waters - TOC Duplicates | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| EPA-PZ-2012-5A-FAL20 (680-191377-1) | 11/10/20 | 12:10 Eastern | | Water | | | X | X | 2 | |
| EPA-PZ-2012-5B-FAL20 (680-191377-2) | 11/10/20 | 13:10 Eastern | | Water | | | X | X | 2 | |
| SHL-DUP08-FAL20 (680-191377-5) | 11/10/20 | 09:45 Eastern | | Water | | | X | X | 2 | |
| SHM-96-5B-FAL20 (680-191377-12) | 11/10/20 | 09:40 Eastern | | Water | | | X | X | 2 | |
| SHM-96-5C-FAL20 (680-191377-13) | 11/10/20 | 10:50 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | | | |
|---|---|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
| Relinquished by: DW | Date/Time: 11-13-2020/1416 | Company | Received by: [illegible] | Date/Time: 11/14/2020 0915 | Company ETADEN |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | | Cooler Temperature(s) °C and Other Remarks: | | |

Ver: 01/16/2019

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191377-2

**Login Number: 191377**
**List Number: 1**
**Creator: Banda, Christy S**

**List Source: Eurofins TestAmerica, Savannah**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | N/A | |
| There are no discrepancies between the containers received and the COC. | True | Refer to Job Narrative for details. |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191377-2

**Login Number: 191377**
**List Number: 2**
**Creator: O'Hara, Jake F**

**List Source: Eurofins TestAmerica, Denver**
**List Creation: 11/14/20 05:15 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | N/A | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

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# ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-191519-1
Client Project/Site: Fort Devens

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

*Authorized for release by:*
*11/25/2020 10:04:24 AM*

Kathryn Smith, Client Service Manager
(912)250-0275
Kathy.Smith@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

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*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

# Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

# Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 680-191519-1 | EPA-PZ-2012-6A-FAL20 | Water | 11/11/20 14:30 | 11/13/20 09:30 | |
| 680-191519-2 | EPA-PZ-2012-6B-FAL20 | Water | 11/11/20 15:30 | 11/13/20 09:30 | |
| 680-191519-3 | SHL-DUP04-FAL20 | Water | 11/11/20 12:45 | 11/13/20 09:30 | |
| 680-191519-4 | SHL-DUP10-FAL20 | Water | 11/11/20 12:50 | 11/13/20 09:30 | |
| 680-191519-5 | SHM-05-40X-FAL20 | Water | 11/11/20 12:50 | 11/13/20 09:30 | |
| 680-191519-6 | SHM-07-03-FAL20 | Water | 11/11/20 10:20 | 11/13/20 09:30 | |
| 680-191519-7 | SHM-07-05X-FAL20 | Water | 11/11/20 11:50 | 11/13/20 09:30 | |
| 680-191519-8 | SHM-10-12-FAL20 | Water | 11/11/20 16:05 | 11/13/20 09:30 | |
| 680-191519-9 | SHL-RB2-FAL20 | Water | 11/11/20 16:30 | 11/13/20 09:30 | |
| 680-191519-10 | SHM-93-10D-FAL20 | Water | 11/11/20 14:50 | 11/13/20 09:30 | |
| 680-191519-11 | SHP-01-36X-FAL20 | Water | 11/11/20 09:45 | 11/13/20 09:30 | |
| 680-191519-12 | SHP-01-37X-FAL20 | Water | 11/11/20 11:10 | 11/13/20 09:30 | |
| 680-191519-13 | SHP-01-38A-FAL20 | Water | 11/11/20 12:30 | 11/13/20 09:30 | |

## Job ID: 680-191519-1

**Laboratory: Eurofins TestAmerica, Savannah**

**Narrative**

# CASE NARRATIVE
# Client: Seres Engineering & Services LLC
# Project: Fort Devens

## Report Number: 680-191519-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 11/13/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.4º C and 4.1º C.

**METALS (ICP) - DISSOLVED**
Samples EPA-PZ-2012-6A-FAL20 (680-191519-1), EPA-PZ-2012-6B-FAL20 (680-191519-2), SHL-DUP04-FAL20 (680-191519-3), SHL-DUP10-FAL20 (680-191519-4), SHM-05-40X-FAL20 (680-191519-5), SHM-07-03-FAL20 (680-191519-6), SHM-07-05X-FAL20 (680-191519-7), SHM-10-12-FAL20 (680-191519-8), SHL-RB2-FAL20 (680-191519-9), SHM-93-10D-FAL20 (680-191519-10), SHP-01-36X-FAL20 (680-191519-11), SHP-01-37X-FAL20 (680-191519-12) and SHP-01-38A-FAL20 (680-191519-13) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared and analyzed on 11/16/2020.

Manganese recovered high for the MS of sample SHM-10-12-FAL20 MSMS (680-191519-8) in batch 680-644415.

Iron and Manganese recovered low for the MSD of sample SHM-10-12-FAL20 MSDMSD (680-191519-8) in batch 680-644415.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples EPA-PZ-2012-6A-FAL20 (680-191519-1), EPA-PZ-2012-6B-FAL20 (680-191519-2), SHL-DUP04-FAL20 (680-191519-3), SHL-DUP10-FAL20 (680-191519-4), SHM-05-40X-FAL20 (680-191519-5), SHM-07-03-FAL20 (680-191519-6), SHM-07-05X-FAL20 (680-191519-7), SHM-10-12-FAL20 (680-191519-8), SHL-RB2-FAL20 (680-191519-9), SHM-93-10D-FAL20 (680-191519-10), SHP-01-36X-FAL20 (680-191519-11), SHP-01-37X-FAL20 (680-191519-12) and SHP-01-38A-FAL20 (680-191519-13) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared and analyzed on 11/16/2020.

Arsenic recovered low for the MS of sample SHM-10-12-FAL20 MSMS (680-191519-8) in batch 680-644237.

Arsenic recovered high for the MSD of sample SHM-10-12-FAL20 MSDMSD (680-191519-8) in batch 680-644237.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples EPA-PZ-2012-6A-FAL20 (680-191519-1), EPA-PZ-2012-6B-FAL20 (680-191519-2), SHL-DUP04-FAL20 (680-191519-3), SHL-DUP10-FAL20 (680-191519-4), SHM-05-40X-FAL20 (680-191519-5), SHM-07-03-FAL20 (680-191519-6), SHM-07-05X-FAL20 (680-191519-7), SHM-10-12-FAL20 (680-191519-8), SHM-93-10D-FAL20 (680-191519-10), SHP-01-36X-FAL20 (680-191519-11), SHP-01-37X-FAL20 (680-191519-12) and SHP-01-38A-FAL20 (680-191519-13) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 11/18/2020 and 11/19/2020.

Alkalinity was detected in method blank MB 280-517476/5 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

## Job ID: 680-191519-1 (Continued)

### Laboratory: Eurofins TestAmerica, Savannah (Continued)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**

Samples EPA-PZ-2012-6A-FAL20 (680-191519-1), EPA-PZ-2012-6B-FAL20 (680-191519-2), SHL-DUP04-FAL20 (680-191519-3), SHL-DUP10-FAL20 (680-191519-4), SHM-05-40X-FAL20 (680-191519-5), SHM-07-03-FAL20 (680-191519-6), SHM-07-05X-FAL20 (680-191519-7), SHM-10-12-FAL20 (680-191519-8), SHM-93-10D-FAL20 (680-191519-10), SHP-01-36X-FAL20 (680-191519-11), SHP-01-37X-FAL20 (680-191519-12) and SHP-01-38A-FAL20 (680-191519-13) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 11/18/2020 and 11/22/2020.

Sample SHM-07-03-FAL20 (680-191519-6)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL ORGANIC CARBON (TOC)**

Samples EPA-PZ-2012-6A-FAL20 (680-191519-1), EPA-PZ-2012-6B-FAL20 (680-191519-2), SHL-DUP04-FAL20 (680-191519-3), SHL-DUP10-FAL20 (680-191519-4), SHM-05-40X-FAL20 (680-191519-5), SHM-07-03-FAL20 (680-191519-6), SHM-07-05X-FAL20 (680-191519-7), SHM-10-12-FAL20 (680-191519-8), SHM-93-10D-FAL20 (680-191519-10), SHP-01-36X-FAL20 (680-191519-11), SHP-01-37X-FAL20 (680-191519-12) and SHP-01-38A-FAL20 (680-191519-13) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 11/22/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Client Sample ID: EPA-PZ-2012-6A-FAL20

**Lab Sample ID: 680-191519-1**
**Date Collected: 11/11/20 14:30**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 9.3 | | 0.50 | 0.20 | mg/L | | | 11/18/20 10:50 | 1 |
| Sulfate | 3.9 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 10:50 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 23:12 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 23:12 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 14:30 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 38 | | 10 | 3.1 | mg/L | | | 11/18/20 15:44 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.97 | J | 1.0 | 0.35 | mg/L | | | 11/22/20 05:30 | 1 |

## Client Sample ID: EPA-PZ-2012-6B-FAL20

**Lab Sample ID: 680-191519-2**
**Date Collected: 11/11/20 15:30**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 3.7 | | 0.50 | 0.20 | mg/L | | | 11/18/20 11:03 | 1 |
| Sulfate | 2.8 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 11:03 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 16000 | | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 22:46 | 1 |
| Manganese | 970 | | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 22:46 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 300 | | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 14:21 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 42 | | 10 | 3.1 | mg/L | | | 11/19/20 16:03 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.3 | | 1.0 | 0.35 | mg/L | | | 11/22/20 05:47 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Client Sample ID: SHL-DUP04-FAL20

**Lab Sample ID: 680-191519-3**
**Date Collected: 11/11/20 12:45**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | | 0.50 | 0.20 | mg/L | | | 11/18/20 11:16 | 1 |
| Sulfate | 8.1 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 11:16 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 25000 | | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 23:17 | 1 |
| Manganese | 2300 | | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 23:17 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 140 | | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 14:34 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 91 | | 10 | 3.1 | mg/L | | | 11/19/20 16:08 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.4 | | 1.0 | 0.35 | mg/L | | | 11/22/20 06:06 | 1 |

## Client Sample ID: SHL-DUP10-FAL20

**Lab Sample ID: 680-191519-4**
**Date Collected: 11/11/20 12:50**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 11 | | 0.50 | 0.20 | mg/L | | | 11/18/20 11:28 | 1 |
| Sulfate | 3.8 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 11:28 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 24000 | | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 22:40 | 1 |
| Manganese | 680 | | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 22:40 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2300 | | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 14:18 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 140 | | 10 | 3.1 | mg/L | | | 11/19/20 16:15 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.6 | | 1.0 | 0.35 | mg/L | | | 11/22/20 06:23 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Client Sample ID: SHM-05-40X-FAL20

**Lab Sample ID: 680-191519-5**
**Date Collected: 11/11/20 12:50**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 11 | | 0.50 | 0.20 | mg/L | | | 11/18/20 16:07 | 1 |
| Sulfate | 3.8 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 16:07 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 24000 | | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 23:22 | 1 |
| Manganese | 670 | | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 23:22 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2100 | | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 14:39 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 150 | | 10 | 3.1 | mg/L | | | 11/19/20 16:21 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.6 | | 1.0 | 0.35 | mg/L | | | 11/22/20 06:42 | 1 |

## Client Sample ID: SHM-07-03-FAL20

**Lab Sample ID: 680-191519-6**
**Date Collected: 11/11/20 10:20**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 11 | | 1.0 | 0.40 | mg/L | | | 11/18/20 16:19 | 1 |

### Method: 9056A - Anions, Ion Chromatography - DL

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 320 | | 5.0 | 2.0 | mg/L | | | 11/22/20 08:08 | 10 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 320 | | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 22:35 | 1 |
| Manganese | 8.9 | J | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 22:35 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 14:15 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 15 | | 10 | 3.1 | mg/L | | | 11/19/20 16:49 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.87 | J | 1.0 | 0.35 | mg/L | | | 11/22/20 06:58 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Client Sample ID: SHM-07-05X-FAL20

**Lab Sample ID: 680-191519-7**
**Date Collected: 11/11/20 11:50**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 48 | | 0.50 | 0.20 | mg/L | | | 11/18/20 16:32 | 1 |
| Sulfate | 2.7 | | 1.0 | 0.40 | mg/L | | | 11/18/20 16:32 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 1900 | | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 23:27 | 1 |
| Manganese | 140 | | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 23:27 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 83 | | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 14:42 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 38 | | 10 | 3.1 | mg/L | | | 11/19/20 16:59 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.0 | | 1.0 | 0.35 | mg/L | | | 11/22/20 07:15 | 1 |

## Client Sample ID: SHM-10-12-FAL20

**Lab Sample ID: 680-191519-8**
**Date Collected: 11/11/20 16:05**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.9 | | 0.50 | 0.20 | mg/L | | | 11/18/20 15:29 | 1 |
| Sulfate | 1.7 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 15:29 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 69000 | J | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 22:09 | 1 |
| Manganese | 5000 | J | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 22:09 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3400 | J | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 13:28 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 170 | | 10 | 3.1 | mg/L | | | 11/19/20 17:04 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 4.1 | | 1.0 | 0.35 | mg/L | | | 11/22/20 04:13 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Client Sample ID: SHL-RB2-FAL20

**Lab Sample ID: 680-191519-9**
**Date Collected: 11/11/20 16:30**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 18 | J | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 23:33 | 1 |
| Manganese | 1.1 | J | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 23:33 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 14:45 | 1 |

## Client Sample ID: SHM-93-10D-FAL20

**Lab Sample ID: 680-191519-10**
**Date Collected: 11/11/20 14:50**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 30 | | 0.50 | 0.20 | mg/L | | | 11/18/20 16:45 | 1 |
| Sulfate | 18 | | 1.0 | 0.40 | mg/L | | | 11/18/20 16:45 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 490 | | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 23:06 | 1 |
| Manganese | 9.9 | J | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 23:06 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 14:27 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 53 | | 10 | 3.1 | mg/L | | | 11/18/20 15:49 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.2 | | 1.0 | 0.35 | mg/L | | | 11/22/20 07:32 | 1 |

## Client Sample ID: SHP-01-36X-FAL20

**Lab Sample ID: 680-191519-11**
**Date Collected: 11/11/20 09:45**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 74 | | 0.50 | 0.20 | mg/L | | | 11/18/20 16:57 | 1 |
| Sulfate | 8.6 | | 1.0 | 0.40 | mg/L | | | 11/18/20 16:57 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 530 | | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 23:38 | 1 |
| Manganese | 49 | | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 23:38 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 6.6 | | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 14:55 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Client Sample ID: SHP-01-36X-FAL20

**Lab Sample ID: 680-191519-11**
**Date Collected: 11/11/20 09:45**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 33 | | 10 | 3.1 | mg/L | | | 11/18/20 15:54 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.9 | | 1.0 | 0.35 | mg/L | | | 11/22/20 08:25 | 1 |

## Client Sample ID: SHP-01-37X-FAL20

**Lab Sample ID: 680-191519-12**
**Date Collected: 11/11/20 11:10**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 75 | | 0.50 | 0.20 | mg/L | | | 11/18/20 17:10 | 1 |
| Sulfate | 8.3 | | 1.0 | 0.40 | mg/L | | | 11/18/20 17:10 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 430 | | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 23:43 | 1 |
| Manganese | 53 | | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 23:43 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 6.1 | | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 14:58 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 25 | | 10 | 3.1 | mg/L | | | 11/18/20 15:58 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 3.7 | | 1.0 | 0.35 | mg/L | | | 11/22/20 08:39 | 1 |

## Client Sample ID: SHP-01-38A-FAL20

**Lab Sample ID: 680-191519-13**
**Date Collected: 11/11/20 12:30**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | | 0.50 | 0.20 | mg/L | | | 11/18/20 17:23 | 1 |
| Sulfate | 8.0 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 17:23 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 24000 | | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 23:01 | 1 |
| Manganese | 2200 | | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 23:01 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 150 | | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 14:24 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Client Sample ID: SHP-01-38A-FAL20

**Lab Sample ID: 680-191519-13**

**Date Collected: 11/11/20 12:30**

**Matrix: Water**

**Date Received: 11/13/20 09:30**

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 90 | | 10 | 3.1 | mg/L | | | 11/18/20 16:04 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.4 | | 1.0 | 0.35 | mg/L | | | 11/22/20 08:56 | 1 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-644485/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644485**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/18/20 08:18 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/18/20 08:18 | 1 |

**Lab Sample ID: LCS 680-644485/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644485**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.2 | | mg/L | | 102 | 87 - 111 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: LCSD 680-644485/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644485**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.2 | | mg/L | | 102 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.2 | | mg/L | | 102 | 87 - 112 | 0 | 15 |

**Lab Sample ID: MB 680-644486/33** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644486**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U M | 0.50 | 0.20 | mg/L | | | 11/18/20 14:51 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/18/20 14:51 | 1 |

**Lab Sample ID: LCS 680-644486/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644486**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.2 | | mg/L | | 102 | 87 - 111 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: LCSD 680-644486/35** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644486**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.2 | | mg/L | | 102 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.2 | | mg/L | | 102 | 87 - 112 | 0 | 15 |

**Lab Sample ID: 680-191519-8 MS** — **Client Sample ID: SHM-10-12-FAL20 MS**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644486**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.9 | | 10.0 | 13.4 | | mg/L | | 105 | 87 - 111 |
| Sulfate | 1.7 | M | 10.0 | 11.8 | M | mg/L | | 101 | 87 - 112 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: 680-191519-8 MSD**
**Matrix: Water**
**Analysis Batch: 644486**

**Client Sample ID: SHM-10-12-FAL20 MSD**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.9 | | 10.0 | 13.5 | | mg/L | | 106 | 87 - 111 | 1 | 15 |
| Sulfate | 1.7 | M | 10.0 | 12.1 | | mg/L | | 104 | 87 - 112 | 3 | 15 |

**Lab Sample ID: MB 680-645209/40**
**Matrix: Water**
**Analysis Batch: 645209**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/22/20 05:11 | 1 |
| Sulfate | 0.40 | U M | 1.0 | 0.40 | mg/L | | | 11/22/20 05:11 | 1 |

**Lab Sample ID: LCS 680-645209/41**
**Matrix: Water**
**Analysis Batch: 645209**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.93 | | mg/L | | 99 | 87 - 111 |
| Sulfate | 10.0 | 9.54 | | mg/L | | 95 | 87 - 112 |

**Lab Sample ID: LCSD 680-645209/42**
**Matrix: Water**
**Analysis Batch: 645209**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.91 | | mg/L | | 99 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 9.55 | | mg/L | | 96 | 87 - 112 | 0 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-644181/1-A**
**Matrix: Water**
**Analysis Batch: 644415**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 644181**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 21:59 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 21:59 | 1 |

**Lab Sample ID: LCS 680-644181/2-A**
**Matrix: Water**
**Analysis Batch: 644415**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 644181**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4900 | | ug/L | | 98 | 87 - 115 |
| Manganese | 400 | 392 | | ug/L | | 98 | 90 - 114 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 680-191519-8 MS** — **Client Sample ID: SHM-10-12-FAL20 MS**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644415** — **Prep Batch: 644181**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 69000 | J | 5000 | 73700 | 4 | ug/L | | 99 | 87 - 115 |
| Manganese | 5000 | J | 400 | 5440 | 4 | ug/L | | 119 | 90 - 114 |

**Lab Sample ID: 680-191519-8 MSD** — **Client Sample ID: SHM-10-12-FAL20 MSD**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644415** — **Prep Batch: 644181**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 69000 | J | 5000 | 71100 | 4 | ug/L | | 47 | 87 - 115 | 4 | 20 |
| Manganese | 5000 | J | 400 | 5260 | 4 | ug/L | | 73 | 90 - 114 | 4 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-644180/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 644237** — **Prep Batch: 644180**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 13:21 | 1 |
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 13:21 | 1 |

**Lab Sample ID: LCS 680-644180/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 644237** — **Prep Batch: 644180**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 111 | | ug/L | | 111 | 84 - 116 |
| Arsenic | 100 | 111 | | ug/L | | 111 | 84 - 116 |

**Lab Sample ID: 680-191519-8 MS** — **Client Sample ID: SHM-10-12-FAL20 MS**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644237** — **Prep Batch: 644180**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3400 | J | 100 | 3250 | 4 | ug/L | | -128 | 84 - 116 |

**Lab Sample ID: 680-191519-8 MSD** — **Client Sample ID: SHM-10-12-FAL20 MSD**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644237** — **Prep Batch: 644180**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3400 | J | 100 | 3570 | 4 | ug/L | | 185 | 84 - 116 | 9 | 20 |

## Method: 9060A - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-517972/35**
**Matrix: Water**
**Analysis Batch: 517972**

**Client Sample ID: Method Blank**
**Prep Type: Dissolved**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/22/20 03:23 | 1 |

**Lab Sample ID: LCS 280-517972/34**
**Matrix: Water**
**Analysis Batch: 517972**

**Client Sample ID: Lab Control Sample**
**Prep Type: Dissolved**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 23.3 | | mg/L | | 93 | 88 - 112 |

**Lab Sample ID: 680-191519-8 MS**
**Matrix: Water**
**Analysis Batch: 517972**

**Client Sample ID: SHM-10-12-FAL20 MS**
**Prep Type: Dissolved**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 4.1 | | 25.0 | 27.2 | | mg/L | | 92 | 88 - 112 |

**Lab Sample ID: 680-191519-8 MSD**
**Matrix: Water**
**Analysis Batch: 517972**

**Client Sample ID: SHM-10-12-FAL20 MSD**
**Prep Type: Dissolved**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 4.1 | | 25.0 | 27.5 | | mg/L | | 94 | 88 - 112 | 1 | 15 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-517299/31**
**Matrix: Water**
**Analysis Batch: 517299**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/18/20 15:20 | 1 |

**Lab Sample ID: LCS 280-517299/30**
**Matrix: Water**
**Analysis Batch: 517299**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 214 | | mg/L | | 107 | 89 - 109 |

**Lab Sample ID: MB 280-517476/31**
**Matrix: Water**
**Analysis Batch: 517476**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/19/20 16:44 | 1 |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: MB 280-517476/5**
**Matrix: Water**
**Analysis Batch: 517476**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.60 | J | 10 | 3.1 | mg/L | | | 11/19/20 13:24 | 1 |

**Lab Sample ID: LCS 280-517476/30**
**Matrix: Water**
**Analysis Batch: 517476**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 206 | | mg/L | | 103 | 89 - 109 | | |

**Lab Sample ID: LCS 280-517476/4**
**Matrix: Water**
**Analysis Batch: 517476**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 192 | | mg/L | | 96 | 89 - 109 | | |

**Lab Sample ID: 680-191519-6 DU**
**Matrix: Water**
**Analysis Batch: 517476**

**Client Sample ID: SHM-07-03-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 15 | | | 14.5 | | mg/L | | | | 2 | 10 |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## HPLC/IC

### Analysis Batch: 644485

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191519-1 | EPA-PZ-2012-6A-FAL20 | Total/NA | Water | 9056A | |
| 680-191519-2 | EPA-PZ-2012-6B-FAL20 | Total/NA | Water | 9056A | |
| 680-191519-3 | SHL-DUP04-FAL20 | Total/NA | Water | 9056A | |
| 680-191519-4 | SHL-DUP10-FAL20 | Total/NA | Water | 9056A | |
| MB 680-644485/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-644485/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-644485/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |

### Analysis Batch: 644486

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191519-5 | SHM-05-40X-FAL20 | Total/NA | Water | 9056A | |
| 680-191519-6 | SHM-07-03-FAL20 | Total/NA | Water | 9056A | |
| 680-191519-7 | SHM-07-05X-FAL20 | Total/NA | Water | 9056A | |
| 680-191519-8 | SHM-10-12-FAL20 | Total/NA | Water | 9056A | |
| 680-191519-10 | SHM-93-10D-FAL20 | Total/NA | Water | 9056A | |
| 680-191519-11 | SHP-01-36X-FAL20 | Total/NA | Water | 9056A | |
| 680-191519-12 | SHP-01-37X-FAL20 | Total/NA | Water | 9056A | |
| 680-191519-13 | SHP-01-38A-FAL20 | Total/NA | Water | 9056A | |
| MB 680-644486/33 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-644486/34 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-644486/35 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-191519-8 MS | SHM-10-12-FAL20 MS | Total/NA | Water | 9056A | |
| 680-191519-8 MSD | SHM-10-12-FAL20 MSD | Total/NA | Water | 9056A | |

### Analysis Batch: 645209

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191519-6 - DL | SHM-07-03-FAL20 | Total/NA | Water | 9056A | |
| MB 680-645209/40 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-645209/41 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-645209/42 | Lab Control Sample Dup | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 644180

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191519-1 | EPA-PZ-2012-6A-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-2 | EPA-PZ-2012-6B-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-3 | SHL-DUP04-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-4 | SHL-DUP10-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-5 | SHM-05-40X-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-6 | SHM-07-03-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-7 | SHM-07-05X-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-8 | SHM-10-12-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-9 | SHL-RB2-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-10 | SHM-93-10D-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-11 | SHP-01-36X-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-12 | SHP-01-37X-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-13 | SHP-01-38A-FAL20 | Dissolved | Water | 3005A | |
| MB 680-644180/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-644180/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191519-8 MS | SHM-10-12-FAL20 MS | Dissolved | Water | 3005A | |

## Metals (Continued)

### Prep Batch: 644180 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191519-8 MSD | SHM-10-12-FAL20 MSD | Dissolved | Water | 3005A | |

### Prep Batch: 644181

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191519-1 | EPA-PZ-2012-6A-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-2 | EPA-PZ-2012-6B-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-3 | SHL-DUP04-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-4 | SHL-DUP10-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-5 | SHM-05-40X-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-6 | SHM-07-03-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-7 | SHM-07-05X-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-8 | SHM-10-12-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-9 | SHL-RB2-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-10 | SHM-93-10D-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-11 | SHP-01-36X-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-12 | SHP-01-37X-FAL20 | Dissolved | Water | 3005A | |
| 680-191519-13 | SHP-01-38A-FAL20 | Dissolved | Water | 3005A | |
| MB 680-644181/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-644181/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191519-8 MS | SHM-10-12-FAL20 MS | Dissolved | Water | 3005A | |
| 680-191519-8 MSD | SHM-10-12-FAL20 MSD | Dissolved | Water | 3005A | |

### Analysis Batch: 644237

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191519-8 | SHM-10-12-FAL20 | Dissolved | Water | 6020A | 644180 |
| MB 680-644180/1-A | Method Blank | Total Recoverable | Water | 6020A | 644180 |
| LCS 680-644180/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 644180 |
| 680-191519-8 MS | SHM-10-12-FAL20 MS | Dissolved | Water | 6020A | 644180 |
| 680-191519-8 MSD | SHM-10-12-FAL20 MSD | Dissolved | Water | 6020A | 644180 |

### Analysis Batch: 644289

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191519-1 | EPA-PZ-2012-6A-FAL20 | Dissolved | Water | 6020A | 644180 |
| 680-191519-2 | EPA-PZ-2012-6B-FAL20 | Dissolved | Water | 6020A | 644180 |
| 680-191519-3 | SHL-DUP04-FAL20 | Dissolved | Water | 6020A | 644180 |
| 680-191519-4 | SHL-DUP10-FAL20 | Dissolved | Water | 6020A | 644180 |
| 680-191519-5 | SHM-05-40X-FAL20 | Dissolved | Water | 6020A | 644180 |
| 680-191519-6 | SHM-07-03-FAL20 | Dissolved | Water | 6020A | 644180 |
| 680-191519-7 | SHM-07-05X-FAL20 | Dissolved | Water | 6020A | 644180 |
| 680-191519-9 | SHL-RB2-FAL20 | Dissolved | Water | 6020A | 644180 |
| 680-191519-10 | SHM-93-10D-FAL20 | Dissolved | Water | 6020A | 644180 |
| 680-191519-11 | SHP-01-36X-FAL20 | Dissolved | Water | 6020A | 644180 |
| 680-191519-12 | SHP-01-37X-FAL20 | Dissolved | Water | 6020A | 644180 |
| 680-191519-13 | SHP-01-38A-FAL20 | Dissolved | Water | 6020A | 644180 |
| MB 680-644180/1-A | Method Blank | Total Recoverable | Water | 6020A | 644180 |
| LCS 680-644180/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 644180 |

### Analysis Batch: 644415

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191519-1 | EPA-PZ-2012-6A-FAL20 | Dissolved | Water | 6010C | 644181 |
| 680-191519-2 | EPA-PZ-2012-6B-FAL20 | Dissolved | Water | 6010C | 644181 |

## Metals (Continued)

### Analysis Batch: 644415 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191519-3 | SHL-DUP04-FAL20 | Dissolved | Water | 6010C | 644181 |
| 680-191519-4 | SHL-DUP10-FAL20 | Dissolved | Water | 6010C | 644181 |
| 680-191519-5 | SHM-05-40X-FAL20 | Dissolved | Water | 6010C | 644181 |
| 680-191519-6 | SHM-07-03-FAL20 | Dissolved | Water | 6010C | 644181 |
| 680-191519-7 | SHM-07-05X-FAL20 | Dissolved | Water | 6010C | 644181 |
| 680-191519-8 | SHM-10-12-FAL20 | Dissolved | Water | 6010C | 644181 |
| 680-191519-9 | SHL-RB2-FAL20 | Dissolved | Water | 6010C | 644181 |
| 680-191519-10 | SHM-93-10D-FAL20 | Dissolved | Water | 6010C | 644181 |
| 680-191519-11 | SHP-01-36X-FAL20 | Dissolved | Water | 6010C | 644181 |
| 680-191519-12 | SHP-01-37X-FAL20 | Dissolved | Water | 6010C | 644181 |
| 680-191519-13 | SHP-01-38A-FAL20 | Dissolved | Water | 6010C | 644181 |
| MB 680-644181/1-A | Method Blank | Total Recoverable | Water | 6010C | 644181 |
| LCS 680-644181/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 644181 |
| 680-191519-8 MS | SHM-10-12-FAL20 MS | Dissolved | Water | 6010C | 644181 |
| 680-191519-8 MSD | SHM-10-12-FAL20 MSD | Dissolved | Water | 6010C | 644181 |

## General Chemistry

### Analysis Batch: 517299

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191519-1 | EPA-PZ-2012-6A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191519-10 | SHM-93-10D-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191519-11 | SHP-01-36X-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191519-12 | SHP-01-37X-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191519-13 | SHP-01-38A-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-517299/31 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-517299/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Analysis Batch: 517476

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191519-2 | EPA-PZ-2012-6B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191519-3 | SHL-DUP04-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191519-4 | SHL-DUP10-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191519-5 | SHM-05-40X-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191519-6 | SHM-07-03-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191519-7 | SHM-07-05X-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191519-8 | SHM-10-12-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-517476/31 | Method Blank | Total/NA | Water | SM 2320B | |
| MB 280-517476/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-517476/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| LCS 280-517476/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 680-191519-6 DU | SHM-07-03-FAL20 | Total/NA | Water | SM 2320B | |

### Analysis Batch: 517972

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191519-1 | EPA-PZ-2012-6A-FAL20 | Dissolved | Water | 9060A | |
| 680-191519-2 | EPA-PZ-2012-6B-FAL20 | Dissolved | Water | 9060A | |
| 680-191519-3 | SHL-DUP04-FAL20 | Dissolved | Water | 9060A | |
| 680-191519-4 | SHL-DUP10-FAL20 | Dissolved | Water | 9060A | |
| 680-191519-5 | SHM-05-40X-FAL20 | Dissolved | Water | 9060A | |
| 680-191519-6 | SHM-07-03-FAL20 | Dissolved | Water | 9060A | |

## General Chemistry (Continued)

### Analysis Batch: 517972 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191519-7 | SHM-07-05X-FAL20 | Dissolved | Water | 9060A | |
| 680-191519-8 | SHM-10-12-FAL20 | Dissolved | Water | 9060A | |
| 680-191519-10 | SHM-93-10D-FAL20 | Dissolved | Water | 9060A | |
| 680-191519-11 | SHP-01-36X-FAL20 | Dissolved | Water | 9060A | |
| 680-191519-12 | SHP-01-37X-FAL20 | Dissolved | Water | 9060A | |
| 680-191519-13 | SHP-01-38A-FAL20 | Dissolved | Water | 9060A | |
| MB 280-517972/35 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-517972/34 | Lab Control Sample | Dissolved | Water | 9060A | |
| 680-191519-8 MS | SHM-10-12-FAL20 MS | Dissolved | Water | 9060A | |
| 680-191519-8 MSD | SHM-10-12-FAL20 MSD | Dissolved | Water | 9060A | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Client Sample ID: EPA-PZ-2012-6A-FAL20

**Lab Sample ID: 680-191519-1**
**Date Collected: 11/11/20 14:30**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644485 | 11/18/20 10:50 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 23:12 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 14:30 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 05:30 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 15:44 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: EPA-PZ-2012-6B-FAL20

**Lab Sample ID: 680-191519-2**
**Date Collected: 11/11/20 15:30**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644485 | 11/18/20 11:03 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 22:46 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 14:21 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 05:47 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517476 | 11/19/20 16:03 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHL-DUP04-FAL20

**Lab Sample ID: 680-191519-3**
**Date Collected: 11/11/20 12:45**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644485 | 11/18/20 11:16 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 23:17 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 14:34 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Client Sample ID: SHL-DUP04-FAL20

**Lab Sample ID: 680-191519-3**
**Matrix: Water**

**Date Collected: 11/11/20 12:45**
**Date Received: 11/13/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 06:06 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517476 | 11/19/20 16:08 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHL-DUP10-FAL20

**Lab Sample ID: 680-191519-4**
**Matrix: Water**

**Date Collected: 11/11/20 12:50**
**Date Received: 11/13/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644485 | 11/18/20 11:28 | T1C | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 22:40 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 14:18 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 06:23 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517476 | 11/19/20 16:15 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-05-40X-FAL20

**Lab Sample ID: 680-191519-5**
**Matrix: Water**

**Date Collected: 11/11/20 12:50**
**Date Received: 11/13/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 16:07 | T1C | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 23:22 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 14:39 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 06:42 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517476 | 11/19/20 16:21 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Client Sample ID: SHM-07-03-FAL20

**Lab Sample ID: 680-191519-6**
**Date Collected: 11/11/20 10:20**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 16:19 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Total/NA | Analysis | 9056A | DL | 10 | 5 mL | 5 mL | 645209 | 11/22/20 08:08 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 22:35 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 14:15 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 06:58 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517476 | 11/19/20 16:49 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-07-05X-FAL20

**Lab Sample ID: 680-191519-7**
**Date Collected: 11/11/20 11:50**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 16:32 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 23:27 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 14:42 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 07:15 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517476 | 11/19/20 16:59 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-10-12-FAL20

**Lab Sample ID: 680-191519-8**
**Date Collected: 11/11/20 16:05**
**Matrix: Water**
**Date Received: 11/13/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 15:29 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 22:09 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Client Sample ID: SHM-10-12-FAL20 — Lab Sample ID: 680-191519-8

**Date Collected: 11/11/20 16:05**
**Date Received: 11/13/20 09:30**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644237 | 11/16/20 13:28 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 04:13 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517476 | 11/19/20 17:04 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHL-RB2-FAL20 — Lab Sample ID: 680-191519-9

**Date Collected: 11/11/20 16:30**
**Date Received: 11/13/20 09:30**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 23:33 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 14:45 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |

## Client Sample ID: SHM-93-10D-FAL20 — Lab Sample ID: 680-191519-10

**Date Collected: 11/11/20 14:50**
**Date Received: 11/13/20 09:30**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 16:45 | T1C | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 23:06 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 14:27 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 07:32 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 15:49 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHP-01-36X-FAL20 — Lab Sample ID: 680-191519-11

**Date Collected: 11/11/20 09:45**
**Date Received: 11/13/20 09:30**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 16:57 | T1C | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Client Sample ID: SHP-01-36X-FAL20 — Lab Sample ID: 680-191519-11

**Date Collected: 11/11/20 09:45** — **Matrix: Water**
**Date Received: 11/13/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 23:38 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 14:55 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 08:25 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 15:54 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHP-01-37X-FAL20 — Lab Sample ID: 680-191519-12

**Date Collected: 11/11/20 11:10** — **Matrix: Water**
**Date Received: 11/13/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 17:10 | T1C | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 23:43 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 14:58 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 08:39 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 15:58 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHP-01-38A-FAL20 — Lab Sample ID: 680-191519-13

**Date Collected: 11/11/20 12:30** — **Matrix: Water**
**Date Received: 11/13/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 17:23 | T1C | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 23:01 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 14:24 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 08:56 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Client Sample ID: SHP-01-38A-FAL20

**Date Collected: 11/11/20 12:30**
**Date Received: 11/13/20 09:30**

## Lab Sample ID: 680-191519-13

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 16:04 | RAF | TAL DEN |

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

## Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| ANAB | Dept. of Defense ELAP | L2463 | 09-22-22 |

## Laboratory: Eurofins TestAmerica, Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| A2LA | Dept. of Defense ELAP | 2907.01 | 10-31-21 |

# Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191519-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060A | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | TAL SAV |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

/ RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| ort Devens, Long Term Monitoring | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| ENS-LTM | Contact: | |
| | Ship to: | |

**Comment**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-191519 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 1 | EPA-PZ-2012-1A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-1A | N1 | 23.70 | 28.70 | | |
| 2 | EPA-PZ-2012-1B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-1B | N1 | 73.56 | 78.56 | | |
| 3 | EPA-PZ-2012-2A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-2A | N1 | 18.14 | 23.14 | | |
| 4 | EPA-PZ-2012-2B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-2B | N1 | 73.16 | 78.16 | | |
| 5 | EPA-PZ-2012-3A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-3A | N1 | 19.09 | 24.09 | | |
| 6 | EPA-PZ-2012-3B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-3B | N1 | 68.70 | 73.70 | | |
| 7 | EPA-PZ-2012-4A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4A | N1 | 19.56 | 24.56 | | |
| 8 | EPA-PZ-2012-4B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | N1 | 79.50 | 84.50 | | |
| 9 | EPA-PZ-2012-5A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-5A | N1 | 17.95 | 22.95 | | |
| 10 | EPA-PZ-2012-5B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-5B | N1 | 68.46 | 73.46 | | |
| 11 | EPA-PZ-2012-6A-FAL20 | WG | 11-11-20 | 1430 | DC | X | X | X | X | X | EPA-PZ-2012-6A | N1 | 24.19 | 29.19 | | |
| 12 | EPA-PZ-2012-6B-FAL20 | WG | 11-11-20 | 1530 | DC | X | X | X | X | X | EPA-PZ-2012-6B | N1 | 74.23 | 79.23 | | |
| 13 | EPA-PZ-2012-7A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-7A | N1 | 23.87 | 28.87 | | |
| 14 | EPA-PZ-2012-7B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-7B | N1 | 58.82 | 63.82 | | |
| 15 | EW-01-FAL20 | WG | | | | X | X | X | X | X | EW-01 | N1 | 60.00 | 85.00 | | |
| 16 | EW-04-FAL20 | WG | | | | X | X | X | X | X | EW-04 | N1 | 70.00 | 95.00 | | |
| 17 | N5-P1-FAL20 | WG | | | | X | X | X | X | X | N5-P1 | N1 | 95.50 | 97.50 | | |
| 18 | PZ-12-01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-01 | N1 | 24.00 | 34.00 | | |

**Relinquished by:** Diane Clapp
**Date**
**Time**
**Received by:** 11/11/20 17:35
SHL_eCOC

**Date** 11/12/20 1700 ETA 3.8/4.1
**Time**
**Shipping Date:**
Received by Laboratory: 11-13-20 900 2.1/2.4
Condition:



11/25/2020

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 37 | SHL-23-FAL20 | WG | | | | X | X | X | X | X | SHL-23 | N1 | 23.00 | 33.00 | | |
| 38 | SHL-24-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | N1 | 110.00 | 120.00 | | |
| 39 | SHL-3-FAL20 | WG | | | | X | X | X | X | X | SHL-3 | N1 | 24.00 | 34.00 | | |
| 40 | SHL-4-FAL20 | WG | | | | X | X | X | X | X | SHL-4 | N1 | 3.00 | 13.00 | | |
| 41 | SHL-5-FAL20 | WG | | | | X | X | X | X | X | SHL-5 | N1 | 3.00 | 13.00 | | |
| 42 | SHL-7-FAL20 | WG | | | | X | X | X | X | X | SHL-7 | N1 | 11.00 | 21.00 | | |
| 43 | SHL-8D-FAL20 | WG | | | | X | X | X | X | X | SHL-8D | N1 | 68.00 | 70.00 | | |
| 44 | SHL-8S-FAL20 | WG | | | | X | X | X | X | X | SHL-8S | N1 | 52.00 | 54.00 | | |
| 45 | SHL-9-FAL20 | WG | | | | X | X | X | X | X | SHL-9 | N1 | 15.00 | 25.00 | | |
| 46 | SHL-DUP01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | FD1 | 25.00 | 35.00 | | |
| 47 | SHL-DUP02-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | FD1 | 39.00 | 49.00 | | |
| 48 | SHL-DUP03-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | FD1 | 25.00 | 35.00 | | |
| 49 | SHL-DUP04-FAL20 | WG | 11-11-20 | 1245 | CR | X | X | X | X | X | SHP-01-38A | FD1 | 1.50 | 6.50 | | |
| 50 | SHL-DUP05-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | FD1 | 22.00 | 32.00 | | |
| 51 | SHL-DUP06-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | FD1 | 79.50 | 84.50 | | |
| 52 | SHL-DUP07-FAL20 | WG | | | | X | X | X | X | X | SHL-22 | FD1 | 105.00 | 115.00 | | |
| 53 | SHL-DUP08-FAL20 | WG | | | | X | X | X | X | X | SHM-96-5B | FD1 | 80.00 | 90.00 | | |
| 53 | SHL-DUP09-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | FD1 | 110.00 | 120.00 | | |

**Relinquished by:** Drane Clyde
**Date**
**Time**
Received by: SHL_eCOC 11/11/20 17:35

**Date** 11/12/20 1700 ETA
**Time**
**Shipping Date:**
Received by Laboratory: 11-13-20 930
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 53 | SHL-DUP10-FAL20 | WG | 11-11-20 | 1250 | DC | X | X | X | X | X | SHM-05-40X | FD1 | 32.00 | 34.00 | | |
| 54 | SHM-05-39A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-39A | N1 | 37.00 | 39.00 | | |
| 55 | SHM-05-39B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-39B | N1 | 66.00 | 68.00 | | |
| 56 | SHM-05-40X-FAL20 | WG | 11-11-20 | 1250 | DC | X | X | X | X | X | SHM-05-40X | N1 | 32.00 | 34.00 | | |
| 57 | SHM-05-41A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41A | N1 | 42.00 | 44.00 | | |
| 58 | SHM-05-41B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41B | N1 | 62.00 | 64.00 | | |
| 59 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | MS1 | 88.00 | 93.00 | | |
| 60 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | N1 | 88.00 | 93.00 | | |
| 61 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | SD1 | 88.00 | 93.00 | | |
| 62 | SHM-05-42A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-42A | N1 | 40.00 | 42.00 | | |
| 63 | SHM-05-42B-FAL20 | WG | 11-11-20 | PB | | X | X | X | X | X | SHM-05-42B | N1 | 70.00 | 72.00 | | |
| 64 | SHM-07-03-FAL20 | WG | ~~11-11-20~~ | 1020 | DC | X | X | X | X | X | SHM-07-03 | N1 | 25.00 | 35.00 | | |
| 65 | SHM-07-05X-FAL20 | WG | ~~11-11-20~~ | 1150 | DC | X | X | X | X | X | SHM-07-05X | N1 | 55.00 | 65.00 | | |
| 66 | SHM-10-02-FAL20 | WG | 11-11-20 | PB | | X | X | X | X | X | SHM-10-02 | N1 | 53.00 | 63.00 | | |
| 67 | SHM-10-03-FAL20 | WG | | | | X | X | X | X | X | SHM-10-03 | N1 | 58.50 | 68.50 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | MS1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | N1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | SD1 | 55.00 | 65.00 | | |

**Relinquished by:** Diane Chapgne
**Date**
**Time**
Received by: SHL_eCOC
11/11/20 17:35 [signature]

**Date**
**Time**
**Shipping Date:** [signature] 11/12/20 1700 ETA
Received by Laboratory: [signature] 11-13-20 530
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 69 | SHM-10-05A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-05A | N1 | 50.00 | 60.00 | | |
| 70 | SHM-10-06-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06 | N1 | 69.50 | 79.50 | | |
| 71 | SHM-10-06A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06A | N1 | 77.00 | 87.00 | | |
| 72 | SHM-10-07-FAL20 | WG | | | | X | X | X | X | X | SHM-10-07 | N1 | 40.00 | 50.00 | | |
| 73 | SHM-10-08-FAL20 | WG | | | | X | X | X | X | X | SHM-10-08 | N1 | 46.00 | 56.00 | | |
| 74 | SHM-10-10-FAL20 | WG | | | | X | X | X | X | X | SHM-10-10 | N1 | 56.00 | 66.00 | | |
| 75 | SHM-10-11-FAL20 | WG | | | | X | X | X | X | X | SHM-10-11 | N1 | 50.00 | 60.00 | | |
| 76 | SHM-10-12-FAL20 | WG | 11-11-20 | 1605 | DB | X | X | X | X | X | SHM-10-12 | MS1 | 45.00 | 55.00 | | |
| 77 | SHM-10-12-FAL20 | WG | 11-11-20 | 1605 | DB | X | X | X | X | X | SHM-10-12 | N1 | 45.00 | 55.00 | | |
| 78 | SHM-10-12-FAL20 | WG | 11-11-20 | 1605 | DB | X | X | X | X | X | SHM-10-12 | SD1 | 45.00 | 55.00 | | |
| 79 | ~~SHM-10-13-FAL20~~ RB-SHL-FAL20 | WG | 11-11-20 | 1630 | DB | X | X | X | X | X | SHM-10-13 | N1 | 60.00 | 70.00 | | |
| 80 | SHM-10-14-FAL20 | WG | | | | X | X | X | X | X | SHM-10-14 | N1 | 60.00 | 80.00 | | |
| 81 | SHM-10-15-FAL20 | WG | | | | X | X | X | X | X | SHM-10-15 | N1 | 45.00 | 55.00 | | |
| 82 | SHM-10-16-FAL20 | WG | | | | X | X | X | X | X | SHM-10-16 | N1 | 75.00 | 85.00 | | |
| 83 | SHM-11-02-FAL20 | WG | | | | X | X | X | X | X | SHM-11-02 | N1 | 52.00 | 66.00 | | |
| 84 | SHM-11-06-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | N1 | 25.00 | 35.00 | | |
| 85 | SHM-13-01-FAL20 | WG | | | | X | X | X | X | X | SHM-13-01 | N1 | 39.00 | 49.00 | | |
| 86 | SHM-13-02-FAL20 | WG | | | | X | X | X | X | X | SHM-13-02 | N1 | 60.00 | 70.00 | | |

**Relinquished by:** Dian Clip
**Date**
**Time**
Received by: 11/11/20 17:35 [signature]
SHL_eCOC

**Date**
**Time**
**Shipping Date:** [signature] 11/12/20 1700 ETA
Received by Laboratory: [signature] 11-13-20 930
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **Analytical Test Method** | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 87 | SHM-13-03-FAL20 | WG | | | | X | X | X | X | X | SHM-13-03 | N1 | 42.00 | 52.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | MS1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | N1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | SD1 | 20.00 | 30.00 | | |
| 89 | SHM-13-05-FAL20 | WG | | | | X | X | X | X | X | SHM-13-05 | N1 | 75.00 | 85.00 | | |
| 90 | SHM-13-06-FAL20 | WG | | | | X | X | X | X | X | SHM-13-06 | N1 | 36.00 | 46.00 | | |
| 91 | SHM-13-07-FAL20 | WG | | | | X | X | X | X | X | SHM-13-07 | N1 | 27.00 | 37.00 | | |
| 92 | SHM-13-08-FAL20 | WG | | | | X | X | X | X | X | SHM-13-08 | N1 | 55.00 | 65.00 | | |
| 93 | SHM-13-14D-FAL20 | WG | | | | X | X | X | X | X | SHM-13-14D | N1 | 45.00 | 55.00 | | |
| 94 | SHM-13-14S-FAL20 | WG | | | | X | X | X | X | X | SHM-13-14S | N1 | 5.00 | 15.00 | | |
| 95 | SHM-13-15-FAL20 | WG | | | | X | X | X | X | X | SHM-13-15 | N1 | 50.00 | 60.00 | | |
| 96 | SHM-93-10D-FAL20 | WG | 11-11-20 | 1450 | CR | X | X | X | X | X | SHM-93-10D | N1 | 48.70 | 58.70 | | |
| 97 | SHM-93-18B-FAL20 | WG | | | | X | X | X | X | X | SHM-93-18B | N1 | 78.50 | 88.50 | | |
| 98 | SHM-93-22B-FAL20 | WG | | | | X | X | X | X | X | SHM-93-22B | N1 | 82.30 | 92.30 | | |
| 99 | SHM-93-22C-FAL20 | WG | | | | X | X | X | X | X | SHM-93-22C | N1 | 124.30 | 134.30 | | |
| 100 | SHM-93-24A-FAL20 | WG | | | | X | X | X | X | X | SHM-93-24A | N1 | 13.20 | 23.20 | | |
| 101 | SHM-96-5B-FAL20 | WG | | | | X | X | X | X | X | SHM-96-5B | N1 | 80.00 | 90.00 | | |
| 102 | SHM-96-5C-FAL20 | WG | | | | X | X | X | X | X | SHM-96-5C | N1 | 50.00 | 60.00 | | |

**Relinquished by:** Drew Chapman
**Date** 11/11/20
**Time** 17:35
Received by: [signature]
SHL_eCOC

**Date** 11/12/20
**Time** 1700 ETA
**Shipping Date:**
Received by Laboratory: [signature] 11-13-20 530
Condition:

# CHAIN OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 103 | SHM-99-31A-FAL20 | WG | | | | X | X | X | X | X | SHM-99-31A | N1 | 4.00 | 14.00 | | |
| 104 | SHM-99-31B-FAL20 | WG | | | | X | X | X | X | X | SHM-99-31B | N1 | 50.00 | 60.00 | | |
| 105 | SHM-99-31C-FAL20 | WG | | | | X | X | X | X | X | SHM-99-31C | N1 | 68.00 | 78.00 | | |
| 106 | SHM-99-32X-FAL20 | WG | | | | X | X | X | X | X | SHM-99-32X | N1 | 72.00 | 82.00 | | |
| 107 | SHP-01-36X-FAL20 | WG | 11-11-20 | 945 | CR | X | X | X | X | X | SHP-01-36X | N1 | 3.00 | 8.00 | | |
| 108 | SHP-01-37X-FAL20 | WG | 11-11-20 | 1110 | CR | X | X | X | X | X | SHP-01-37X | N1 | 1.00 | 6.00 | | |
| 109 | SHP-01-38A-FAL20 | WG | 11-11-20 | 1230 | CR | X | X | X | X | X | SHP-01-38A | N1 | 1.50 | 6.50 | | |
| 110 | SHP-2016-06A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-06A | N1 | 81.00 | 86.00 | | |
| 111 | SHP-2016-06B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-06B | N1 | 102.00 | 112.00 | | |
| 112 | SHP-2016-06C-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-06C | N1 | 123.00 | 133.00 | | |
| 113 | SHP-2016-07A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | N1 | 22.00 | 32.00 | | |
| 114 | SHP-2016-07B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07B | N1 | 70.00 | 80.00 | | |
| 115 | SHP-2016-1A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-1A | N1 | 13.00 | 23.00 | | |
| 116 | SHP-2016-1B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-1B | N1 | 75.00 | 85.00 | | |
| 117 | SHP-2016-2A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-2A | N1 | 20.00 | 25.00 | | |
| 118 | SHP-2016-2B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-2B | N1 | 80.00 | 85.00 | | |
| 119 | SHP-2016-3A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-3A | N1 | 20.00 | 25.00 | | |
| 120 | SHP-2016-3B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-3B | N1 | 80.00 | 85.00 | | |

**Relinquished by:** [signature]
**Date**
**Time**
Received by: [signature]
SHL_eCOC
11/11/20 17:35

**Date** 11/12/20
**Time** 1700 ETA
**Shipping Date:**
Received by Laboratory: [signature] 11-13-20 930
Condition:

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191519-1

**Login Number: 191519**
**List Number: 1**
**Creator: Sims, Robert D**

**List Source: Eurofins TestAmerica, Savannah**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191519-1

**Login Number: 191519**
**List Number: 2**
**Creator: O'Hara, Jake F**

**List Source: Eurofins TestAmerica, Denver**
**List Creation: 11/17/20 05:36 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | N/A | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

eurofins | Environment Testing America

# ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-191554-1
Client Project/Site: Fort Devens

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

*Authorized for release by:*
*11/30/2020 4:35:48 PM*

Kathryn Smith, Client Service Manager
(912)250-0275
Kathy.Smith@Eurofinset.com

LINKS

Review your project results through TotalAccess

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*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

# Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 680-191554-1 | SHL-DUP06-FAL20 | Water | 11/13/20 09:15 | 11/14/20 10:30 | |
| 680-191554-2 | SHM-10-06A-FAL20 | Water | 11/13/20 11:45 | 11/14/20 10:30 | |
| 680-191554-3 | SHL-RB4-FAL20 | Water | 11/13/20 12:50 | 11/14/20 10:30 | |
| 680-191554-4 | SHP-2016-07B-FAL20 | Water | 11/13/20 09:00 | 11/14/20 10:30 | |
| 680-191554-5 | SHL-23-FAL20 | Water | 11/12/20 10:20 | 11/14/20 10:30 | |
| 680-191554-6 | SHL-4-FAL20 | Water | 11/12/20 11:00 | 11/14/20 10:30 | |
| 680-191554-7 | SHM-10-04-FAL20 | Water | 11/12/20 13:25 | 11/14/20 10:30 | |
| 680-191554-8 | SHM-10-05A-FAL20 | Water | 11/12/20 13:55 | 11/14/20 10:30 | |
| 680-191554-9 | SHM-10-11-FAL20 | Water | 11/12/20 11:20 | 11/14/20 10:30 | |
| 680-191554-10 | SHM-10-16-FAL20 | Water | 11/12/20 12:30 | 11/14/20 10:30 | |
| 680-191554-11 | SHM-93-18B-FAL20 | Water | 11/12/20 09:30 | 11/14/20 10:30 | |
| 680-191554-12 | SHP-2016-06A-FAL20 | Water | 11/12/20 11:40 | 11/14/20 10:30 | |
| 680-191554-13 | SHP-2016-06B-FAL20 | Water | 11/12/20 13:40 | 11/14/20 10:30 | |
| 680-191554-14 | SHP-2016-06C-FAL20 | Water | 11/12/20 15:25 | 11/14/20 10:30 | |
| 680-191554-15 | SHL-RB3-FAL20 | Water | 11/12/20 11:20 | 11/14/20 10:30 | |

## Job ID: 680-191554-1

**Laboratory: Eurofins TestAmerica, Savannah**

**Narrative**

# CASE NARRATIVE
# Client: Seres Engineering & Services LLC
# Project: Fort Devens

## Report Number: 680-191554-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 11/14/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 1.9º C, 2.1º C and 2.8º C.

**METALS (ICP) - DISSOLVED**
Samples SHL-DUP06-FAL20 (680-191554-1), SHM-10-06A-FAL20 (680-191554-2), SHL-RB4-FAL20 (680-191554-3), SHP-2016-07B-FAL20 (680-191554-4), SHL-23-FAL20 (680-191554-5), SHL-4-FAL20 (680-191554-6), SHM-10-04-FAL20 (680-191554-7), SHM-10-05A-FAL20 (680-191554-8), SHM-10-11-FAL20 (680-191554-9), SHM-10-16-FAL20 (680-191554-10), SHM-93-18B-FAL20 (680-191554-11), SHP-2016-06A-FAL20 (680-191554-12), SHP-2016-06B-FAL20 (680-191554-13), SHP-2016-06C-FAL20 (680-191554-14) and SHL-RB3-FAL20 (680-191554-15) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/16/2020 and analyzed on 11/16/2020 and 11/17/2020.

Manganese was detected in method blank MB 680-644205/1-A at a level exceeding the reporting limit. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Manganese failed the recovery criteria low for the MS of sample SHM-10-04-FAL20MS (680-191554-7) in batch 680-644415.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples SHL-DUP06-FAL20 (680-191554-1), SHM-10-06A-FAL20 (680-191554-2), SHL-RB4-FAL20 (680-191554-3), SHP-2016-07B-FAL20 (680-191554-4), SHL-23-FAL20 (680-191554-5), SHL-4-FAL20 (680-191554-6), SHM-10-04-FAL20 (680-191554-7), SHM-10-05A-FAL20 (680-191554-8), SHM-10-11-FAL20 (680-191554-9), SHM-10-16-FAL20 (680-191554-10), SHM-93-18B-FAL20 (680-191554-11), SHP-2016-06A-FAL20 (680-191554-12), SHP-2016-06B-FAL20 (680-191554-13), SHP-2016-06C-FAL20 (680-191554-14) and SHL-RB3-FAL20 (680-191554-15) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared and analyzed on 11/16/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples SHL-DUP06-FAL20 (680-191554-1), SHM-10-06A-FAL20 (680-191554-2), SHP-2016-07B-FAL20 (680-191554-4), SHL-23-FAL20 (680-191554-5), SHL-4-FAL20 (680-191554-6), SHM-10-04-FAL20 (680-191554-7), SHM-10-05A-FAL20 (680-191554-8), SHM-10-11-FAL20 (680-191554-9), SHM-10-16-FAL20 (680-191554-10), SHM-93-18B-FAL20 (680-191554-11), SHP-2016-06A-FAL20 (680-191554-12), SHP-2016-06B-FAL20 (680-191554-13) and SHP-2016-06C-FAL20 (680-191554-14) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 11/18/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**
Samples SHL-DUP06-FAL20 (680-191554-1), SHM-10-06A-FAL20 (680-191554-2), SHP-2016-07B-FAL20 (680-191554-4), SHL-23-FAL20 (680-191554-5), SHL-4-FAL20 (680-191554-6), SHM-10-04-FAL20 (680-191554-7), SHM-10-05A-FAL20 (680-191554-8),

## Job ID: 680-191554-1 (Continued)

### Laboratory: Eurofins TestAmerica, Savannah (Continued)

SHM-10-11-FAL20 (680-191554-9), SHM-10-16-FAL20 (680-191554-10), SHM-93-18B-FAL20 (680-191554-11), SHP-2016-06A-FAL20 (680-191554-12), SHP-2016-06B-FAL20 (680-191554-13) and SHP-2016-06C-FAL20 (680-191554-14) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 11/18/2020 and 11/19/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL ORGANIC CARBON (TOC)**

Samples SHL-DUP06-FAL20 (680-191554-1), SHM-10-06A-FAL20 (680-191554-2), SHP-2016-07B-FAL20 (680-191554-4), SHL-23-FAL20 (680-191554-5), SHL-4-FAL20 (680-191554-6), SHM-10-04-FAL20 (680-191554-7), SHM-10-05A-FAL20 (680-191554-8), SHM-10-11-FAL20 (680-191554-9), SHM-10-16-FAL20 (680-191554-10), SHM-93-18B-FAL20 (680-191554-11), SHP-2016-06A-FAL20 (680-191554-12), SHP-2016-06B-FAL20 (680-191554-13) and SHP-2016-06C-FAL20 (680-191554-14) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 11/21/2020, 11/22/2020 and 11/25/2020.

Dissolved Organic Carbon was detected in method blank MB 280-518157/36 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Client Sample ID: SHL-DUP06-FAL20

**Lab Sample ID: 680-191554-1**

**Date Collected: 11/13/20 09:15**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.7 | | 0.50 | 0.20 | mg/L | | | 11/18/20 17:35 | 1 |
| Sulfate | 33 | | 1.0 | 0.40 | mg/L | | | 11/18/20 17:35 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 500 | | 50 | 17 | ug/L | | 11/16/20 10:54 | 11/17/20 11:18 | 1 |
| Manganese | 610 | | 10 | 1.0 | ug/L | | 11/16/20 10:54 | 11/17/20 11:18 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 71 | | 3.0 | 1.5 | ug/L | | 11/16/20 10:54 | 11/16/20 17:07 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 130 | | 10 | 3.1 | mg/L | | | 11/18/20 18:21 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.8 | | 1.0 | 0.35 | mg/L | | | 11/21/20 23:54 | 1 |

## Client Sample ID: SHM-10-06A-FAL20

**Lab Sample ID: 680-191554-2**

**Date Collected: 11/13/20 11:45**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 20 | | 0.50 | 0.20 | mg/L | | | 11/18/20 17:48 | 1 |
| Sulfate | 4.5 | | 1.0 | 0.40 | mg/L | | | 11/18/20 17:48 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 9800 | | 50 | 17 | ug/L | | 11/16/20 10:54 | 11/17/20 11:27 | 1 |
| Manganese | 1500 | | 10 | 1.0 | ug/L | | 11/16/20 10:54 | 11/17/20 11:27 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 71 | | 3.0 | 1.5 | ug/L | | 11/16/20 10:54 | 11/16/20 17:14 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 85 | | 10 | 3.1 | mg/L | | | 11/18/20 18:26 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.4 | | 1.0 | 0.35 | mg/L | | | 11/22/20 00:15 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Client Sample ID: SHL-RB4-FAL20

**Lab Sample ID: 680-191554-3**
**Date Collected: 11/13/20 12:50**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 60 | | 50 | 17 | ug/L | | 11/16/20 10:54 | 11/17/20 11:40 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/16/20 10:54 | 11/17/20 11:40 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/16/20 10:54 | 11/16/20 17:25 | 1 |

## Client Sample ID: SHP-2016-07B-FAL20

**Lab Sample ID: 680-191554-4**
**Date Collected: 11/13/20 09:00**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.6 | | 0.50 | 0.20 | mg/L | | | 11/18/20 19:04 | 1 |
| Sulfate | 30 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 19:04 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 460 | | 50 | 17 | ug/L | | 11/16/20 10:54 | 11/17/20 11:31 | 1 |
| Manganese | 580 | | 10 | 1.0 | ug/L | | 11/16/20 10:54 | 11/17/20 11:31 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 65 | | 3.0 | 1.5 | ug/L | | 11/16/20 10:54 | 11/16/20 17:18 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 110 | | 10 | 3.1 | mg/L | | | 11/18/20 18:31 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.6 | | 1.0 | 0.35 | mg/L | | | 11/22/20 00:32 | 1 |

## Client Sample ID: SHL-23-FAL20

**Lab Sample ID: 680-191554-5**
**Date Collected: 11/12/20 10:20**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.3 | | 0.50 | 0.20 | mg/L | | | 11/18/20 19:16 | 1 |
| Sulfate | 6.2 | | 1.0 | 0.40 | mg/L | | | 11/18/20 19:16 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/16/20 10:54 | 11/17/20 10:39 | 1 |
| Manganese | 11 | | 10 | 1.0 | ug/L | | 11/16/20 10:54 | 11/17/20 10:39 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/16/20 10:54 | 11/16/20 16:42 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Client Sample ID: SHL-23-FAL20

**Lab Sample ID: 680-191554-5**

**Date Collected: 11/12/20 10:20**
**Date Received: 11/14/20 10:30**

**Matrix: Water**

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 5.8 | J | 10 | 3.1 | mg/L | | | 11/18/20 18:36 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.6 | | 1.0 | 0.35 | mg/L | | | 11/22/20 00:48 | 1 |

## Client Sample ID: SHL-4-FAL20

**Lab Sample ID: 680-191554-6**

**Date Collected: 11/12/20 11:00**
**Date Received: 11/14/20 10:30**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.5 | | 0.50 | 0.20 | mg/L | | | 11/18/20 19:29 | 1 |
| Sulfate | 21 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 19:29 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 15000 | | 50 | 17 | ug/L | | 11/16/20 10:54 | 11/17/20 11:22 | 1 |
| Manganese | 2500 | | 10 | 1.0 | ug/L | | 11/16/20 10:54 | 11/17/20 11:22 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 110 | | 3.0 | 1.5 | ug/L | | 11/16/20 10:54 | 11/16/20 17:11 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 76 | | 10 | 3.1 | mg/L | | | 11/18/20 18:41 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.6 | | 1.0 | 0.35 | mg/L | | | 11/22/20 01:39 | 1 |

## Client Sample ID: SHM-10-04-FAL20

**Lab Sample ID: 680-191554-7**

**Date Collected: 11/12/20 13:25**
**Date Received: 11/14/20 10:30**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 90 | | 0.50 | 0.20 | mg/L | | | 11/18/20 18:26 | 1 |
| Sulfate | 17 | | 1.0 | 0.40 | mg/L | | | 11/18/20 18:26 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/16/20 10:54 | 11/17/20 10:13 | 1 |
| Manganese | 280 | J | 10 | 1.0 | ug/L | | 11/16/20 10:54 | 11/17/20 10:13 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/16/20 10:54 | 11/16/20 16:25 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Client Sample ID: SHM-10-04-FAL20

**Lab Sample ID: 680-191554-7**

**Date Collected: 11/12/20 13:25**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 63 | | 10 | 3.1 | mg/L | | | 11/18/20 18:57 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.2 | | 1.0 | 0.35 | mg/L | | | 11/21/20 23:05 | 1 |

## Client Sample ID: SHM-10-05A-FAL20

**Lab Sample ID: 680-191554-8**

**Date Collected: 11/12/20 13:55**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 43 | | 0.50 | 0.20 | mg/L | | | 11/18/20 19:42 | 1 |
| Sulfate | 8.8 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 19:42 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 96 | | 50 | 17 | ug/L | | 11/16/20 10:54 | 11/17/20 11:00 | 1 |
| Manganese | 3.5 | J | 10 | 1.0 | ug/L | | 11/16/20 10:54 | 11/17/20 11:00 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2.0 | J | 3.0 | 1.5 | ug/L | | 11/16/20 10:54 | 11/16/20 16:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 36 | | 10 | 3.1 | mg/L | | | 11/18/20 19:02 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.89 | J | 1.0 | 0.35 | mg/L | | | 11/22/20 01:58 | 1 |

## Client Sample ID: SHM-10-11-FAL20

**Lab Sample ID: 680-191554-9**

**Date Collected: 11/12/20 11:20**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 34 | | 0.50 | 0.20 | mg/L | | | 11/18/20 19:54 | 1 |
| Sulfate | 56 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 19:54 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 47000 | | 50 | 17 | ug/L | | 11/16/20 10:54 | 11/17/20 11:36 | 1 |
| Manganese | 1900 | | 10 | 1.0 | ug/L | | 11/16/20 10:54 | 11/17/20 11:36 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 430 | | 3.0 | 1.5 | ug/L | | 11/16/20 10:54 | 11/16/20 17:21 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Client Sample ID: SHM-10-11-FAL20

**Lab Sample ID: 680-191554-9**

**Date Collected: 11/12/20 11:20**
**Date Received: 11/14/20 10:30**

**Matrix: Water**

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 130 | | 10 | 3.1 | mg/L | | | 11/18/20 19:07 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.5 | | 1.0 | 0.35 | mg/L | | | 11/22/20 02:15 | 1 |

## Client Sample ID: SHM-10-16-FAL20

**Lab Sample ID: 680-191554-10**

**Date Collected: 11/12/20 12:30**
**Date Received: 11/14/20 10:30**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 26 | | 0.50 | 0.20 | mg/L | | | 11/18/20 20:07 | 1 |
| Sulfate | 3.9 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 20:07 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 29000 | | 50 | 17 | ug/L | | 11/16/20 10:54 | 11/17/20 10:55 | 1 |
| Manganese | 2100 | | 10 | 1.0 | ug/L | | 11/16/20 10:54 | 11/17/20 10:55 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1100 | | 3.0 | 1.5 | ug/L | | 11/16/20 10:54 | 11/16/20 16:46 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 290 | | 10 | 3.1 | mg/L | | | 11/18/20 19:14 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.8 | | 1.0 | 0.35 | mg/L | | | 11/22/20 02:32 | 1 |

## Client Sample ID: SHM-93-18B-FAL20

**Lab Sample ID: 680-191554-11**

**Date Collected: 11/12/20 09:30**
**Date Received: 11/14/20 10:30**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 140 | | 0.50 | 0.20 | mg/L | | | 11/18/20 20:20 | 1 |
| Sulfate | 34 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 20:20 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/16/20 10:54 | 11/17/20 11:13 | 1 |
| Manganese | 450 | | 10 | 1.0 | ug/L | | 11/16/20 10:54 | 11/17/20 11:13 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/16/20 10:54 | 11/16/20 17:04 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Client Sample ID: SHM-93-18B-FAL20

**Lab Sample ID: 680-191554-11**

**Date Collected: 11/12/20 09:30**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 49 | | 10 | 3.1 | mg/L | | | 11/18/20 19:19 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.83 | J | 1.0 | 0.35 | mg/L | | | 11/22/20 02:49 | 1 |

## Client Sample ID: SHP-2016-06A-FAL20

**Lab Sample ID: 680-191554-12**

**Date Collected: 11/12/20 11:40**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 4.9 | | 0.50 | 0.20 | mg/L | | | 11/18/20 20:32 | 1 |
| Sulfate | 41 | M | 1.0 | 0.40 | mg/L | | | 11/18/20 20:32 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 340 | | 50 | 17 | ug/L | | 11/16/20 10:54 | 11/17/20 11:09 | 1 |
| Manganese | 1000 | | 10 | 1.0 | ug/L | | 11/16/20 10:54 | 11/17/20 11:09 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 640 | | 3.0 | 1.5 | ug/L | | 11/16/20 10:54 | 11/16/20 17:00 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 150 | | 10 | 3.1 | mg/L | | | 11/18/20 19:25 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 3.3 | | 1.0 | 0.35 | mg/L | | | 11/22/20 03:58 | 1 |

## Client Sample ID: SHP-2016-06B-FAL20

**Lab Sample ID: 680-191554-13**

**Date Collected: 11/12/20 13:40**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 3.6 | | 0.50 | 0.20 | mg/L | | | 11/19/20 16:57 | 1 |
| Sulfate | 76 | M | 1.0 | 0.40 | mg/L | | | 11/19/20 16:57 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 240 | | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 23:48 | 1 |
| Manganese | 550 | | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 23:48 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1100 | | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 15:01 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Client Sample ID: SHP-2016-06B-FAL20

**Lab Sample ID: 680-191554-13**

**Date Collected: 11/12/20 13:40**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 160 | | 10 | 3.1 | mg/L | | | 11/18/20 19:31 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 4.8 | | 1.0 | 0.35 | mg/L | | | 11/25/20 21:19 | 1 |

## Client Sample ID: SHP-2016-06C-FAL20

**Lab Sample ID: 680-191554-14**

**Date Collected: 11/12/20 15:25**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.5 | | 0.50 | 0.20 | mg/L | | | 11/19/20 17:09 | 1 |
| Sulfate | 9.4 | M | 1.0 | 0.40 | mg/L | | | 11/19/20 17:09 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 150 | | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/17/20 00:04 | 1 |
| Manganese | 180 | | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/17/20 00:04 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 350 | | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 15:04 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 130 | | 10 | 3.1 | mg/L | | | 11/18/20 19:36 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.84 | J B | 1.0 | 0.35 | mg/L | | | 11/25/20 08:23 | 1 |

## Client Sample ID: SHL-RB3-FAL20

**Lab Sample ID: 680-191554-15**

**Date Collected: 11/12/20 11:20**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/17/20 00:09 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/17/20 00:09 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 15:07 | 1 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-644486/33** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644486**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U M | 0.50 | 0.20 | mg/L | | | 11/18/20 14:51 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/18/20 14:51 | 1 |

**Lab Sample ID: LCS 680-644486/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644486**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.2 | | mg/L | | 102 | 87 - 111 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: LCSD 680-644486/35** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644486**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.2 | | mg/L | | 102 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.2 | | mg/L | | 102 | 87 - 112 | 0 | 15 |

**Lab Sample ID: 680-191554-7 MS** — **Client Sample ID: SHM-10-04-FAL20**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644486**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 90 | | 10.0 | 100 | 4 | mg/L | | 101 | 87 - 111 |
| Sulfate | 17 | | 10.0 | 27.9 | | mg/L | | 106 | 87 - 112 |

**Lab Sample ID: 680-191554-7 MSD** — **Client Sample ID: SHM-10-04-FAL20**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644486**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 90 | | 10.0 | 100 | 4 | mg/L | | 101 | 87 - 111 | 0 | 15 |
| Sulfate | 17 | | 10.0 | 28.1 | | mg/L | | 108 | 87 - 112 | 1 | 15 |

**Lab Sample ID: MB 680-644793/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644793**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/19/20 10:35 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/19/20 10:35 | 1 |

**Lab Sample ID: LCS 680-644793/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 644793**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.2 | | mg/L | | 102 | 87 - 111 |
| Sulfate | 10.0 | 10.4 | | mg/L | | 104 | 87 - 112 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: LCSD 680-644793/4**
**Matrix: Water**
**Analysis Batch: 644793**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.2 | | mg/L | | 102 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.4 | | mg/L | | 104 | 87 - 112 | 0 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-644181/1-A**
**Matrix: Water**
**Analysis Batch: 644415**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 644181**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/16/20 09:45 | 11/16/20 21:59 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/16/20 09:45 | 11/16/20 21:59 | 1 |

**Lab Sample ID: LCS 680-644181/2-A**
**Matrix: Water**
**Analysis Batch: 644415**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 644181**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4900 | | ug/L | | 98 | 87 - 115 |
| Manganese | 400 | 392 | | ug/L | | 98 | 90 - 114 |

**Lab Sample ID: MB 680-644205/1-A**
**Matrix: Water**
**Analysis Batch: 644415**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 644205**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/16/20 10:54 | 11/17/20 10:02 | 1 |
| Manganese | 2.49 | J | 10 | 1.0 | ug/L | | 11/16/20 10:54 | 11/17/20 10:02 | 1 |

**Lab Sample ID: LCS 680-644205/2-A**
**Matrix: Water**
**Analysis Batch: 644415**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 644205**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4900 | | ug/L | | 98 | 87 - 115 |
| Manganese | 400 | 392 | | ug/L | | 98 | 90 - 114 |

**Lab Sample ID: 680-191554-7 MS**
**Matrix: Water**
**Analysis Batch: 644415**

**Client Sample ID: SHM-10-04-FAL20**
**Prep Type: Dissolved**
**Prep Batch: 644205**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 5000 | 4690 | | ug/L | | 94 | 87 - 115 |
| Manganese | 280 | J | 400 | 631 | J | ug/L | | 88 | 90 - 114 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 680-191554-7 MSD** — **Client Sample ID: SHM-10-04-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644415** — **Prep Batch: 644205**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 5000 | 4860 | | ug/L | | 97 | 87 - 115 | 4 | 20 |
| Manganese | 280 | J | 400 | 657 | | ug/L | | 95 | 90 - 114 | 4 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-644180/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 644289** — **Prep Batch: 644180**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/16/20 09:45 | 11/16/20 13:21 | 1 |

**Lab Sample ID: LCS 680-644180/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 644289** — **Prep Batch: 644180**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 111 | | ug/L | | 111 | 84 - 116 |

**Lab Sample ID: MB 680-644204/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 644283** — **Prep Batch: 644204**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/16/20 10:54 | 11/16/20 16:18 | 1 |

**Lab Sample ID: LCS 680-644204/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 644283** — **Prep Batch: 644204**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 100 | | ug/L | | 100 | 84 - 116 |

**Lab Sample ID: 680-191554-7 MS** — **Client Sample ID: SHM-10-04-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644283** — **Prep Batch: 644204**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 100 | 97.7 | | ug/L | | 98 | 84 - 116 |

**Lab Sample ID: 680-191554-7 MSD** — **Client Sample ID: SHM-10-04-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 644283** — **Prep Batch: 644204**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 100 | 104 | | ug/L | | 104 | 84 - 116 | 6 | 20 |

## Method: 9060A - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-517972/35** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517972**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/22/20 03:23 | 1 |

**Lab Sample ID: MB 280-517972/4** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517972**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/21/20 18:38 | 1 |

**Lab Sample ID: LCS 280-517972/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517972**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 23.7 | | mg/L | | 95 | 88 - 112 |

**Lab Sample ID: LCS 280-517972/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517972**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 23.3 | | mg/L | | 93 | 88 - 112 |

**Lab Sample ID: 680-191554-7 MS** — **Client Sample ID: SHM-10-04-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517972**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.2 | | 25.0 | 24.0 | | mg/L | | 91 | 88 - 112 |

**Lab Sample ID: 680-191554-7 MSD** — **Client Sample ID: SHM-10-04-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517972**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.2 | | 25.0 | 23.2 | | mg/L | | 88 | 88 - 112 | 3 | 15 |

**Lab Sample ID: MB 280-518157/36** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 518157**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.589 | J | 1.0 | 0.35 | mg/L | | | 11/25/20 01:27 | 1 |

**Lab Sample ID: LCS 280-518157/35** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 518157**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 23.9 | | mg/L | | 96 | 88 - 112 |

## Method: 9060A - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-518567/4** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 518567**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/25/20 18:36 | 1 |

**Lab Sample ID: MB 280-518567/68** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 518567**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/26/20 11:47 | 1 |

**Lab Sample ID: LCS 280-518567/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 518567**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 25.2 | | mg/L | | 101 | 88 - 112 |

**Lab Sample ID: LCS 280-518567/67** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 518567**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 26.1 | | mg/L | | 104 | 88 - 112 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-517299/57** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 517299**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/18/20 17:46 | 1 |

**Lab Sample ID: LCS 280-517299/56** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 517299**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 192 | | mg/L | | 96 | 89 - 109 |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## HPLC/IC

### Analysis Batch: 644486

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191554-1 | SHL-DUP06-FAL20 | Total/NA | Water | 9056A | |
| 680-191554-2 | SHM-10-06A-FAL20 | Total/NA | Water | 9056A | |
| 680-191554-4 | SHP-2016-07B-FAL20 | Total/NA | Water | 9056A | |
| 680-191554-5 | SHL-23-FAL20 | Total/NA | Water | 9056A | |
| 680-191554-6 | SHL-4-FAL20 | Total/NA | Water | 9056A | |
| 680-191554-7 | SHM-10-04-FAL20 | Total/NA | Water | 9056A | |
| 680-191554-8 | SHM-10-05A-FAL20 | Total/NA | Water | 9056A | |
| 680-191554-9 | SHM-10-11-FAL20 | Total/NA | Water | 9056A | |
| 680-191554-10 | SHM-10-16-FAL20 | Total/NA | Water | 9056A | |
| 680-191554-11 | SHM-93-18B-FAL20 | Total/NA | Water | 9056A | |
| 680-191554-12 | SHP-2016-06A-FAL20 | Total/NA | Water | 9056A | |
| MB 680-644486/33 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-644486/34 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-644486/35 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-191554-7 MS | SHM-10-04-FAL20 | Total/NA | Water | 9056A | |
| 680-191554-7 MSD | SHM-10-04-FAL20 | Total/NA | Water | 9056A | |

### Analysis Batch: 644793

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191554-13 | SHP-2016-06B-FAL20 | Total/NA | Water | 9056A | |
| 680-191554-14 | SHP-2016-06C-FAL20 | Total/NA | Water | 9056A | |
| MB 680-644793/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-644793/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-644793/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 644180

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191554-13 | SHP-2016-06B-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-14 | SHP-2016-06C-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-15 | SHL-RB3-FAL20 | Dissolved | Water | 3005A | |
| MB 680-644180/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-644180/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 644181

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191554-13 | SHP-2016-06B-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-14 | SHP-2016-06C-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-15 | SHL-RB3-FAL20 | Dissolved | Water | 3005A | |
| MB 680-644181/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-644181/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 644204

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191554-1 | SHL-DUP06-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-2 | SHM-10-06A-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-3 | SHL-RB4-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-4 | SHP-2016-07B-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-5 | SHL-23-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-6 | SHL-4-FAL20 | Dissolved | Water | 3005A | |

## Metals (Continued)

### Prep Batch: 644204 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191554-7 | SHM-10-04-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-8 | SHM-10-05A-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-9 | SHM-10-11-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-10 | SHM-10-16-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-11 | SHM-93-18B-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-12 | SHP-2016-06A-FAL20 | Dissolved | Water | 3005A | |
| MB 680-644204/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-644204/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191554-7 MS | SHM-10-04-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-7 MSD | SHM-10-04-FAL20 | Dissolved | Water | 3005A | |

### Prep Batch: 644205

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191554-1 | SHL-DUP06-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-2 | SHM-10-06A-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-3 | SHL-RB4-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-4 | SHP-2016-07B-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-5 | SHL-23-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-6 | SHL-4-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-7 | SHM-10-04-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-8 | SHM-10-05A-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-9 | SHM-10-11-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-10 | SHM-10-16-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-11 | SHM-93-18B-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-12 | SHP-2016-06A-FAL20 | Dissolved | Water | 3005A | |
| MB 680-644205/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-644205/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191554-7 MS | SHM-10-04-FAL20 | Dissolved | Water | 3005A | |
| 680-191554-7 MSD | SHM-10-04-FAL20 | Dissolved | Water | 3005A | |

### Analysis Batch: 644283

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191554-1 | SHL-DUP06-FAL20 | Dissolved | Water | 6020A | 644204 |
| 680-191554-2 | SHM-10-06A-FAL20 | Dissolved | Water | 6020A | 644204 |
| 680-191554-3 | SHL-RB4-FAL20 | Dissolved | Water | 6020A | 644204 |
| 680-191554-4 | SHP-2016-07B-FAL20 | Dissolved | Water | 6020A | 644204 |
| 680-191554-5 | SHL-23-FAL20 | Dissolved | Water | 6020A | 644204 |
| 680-191554-6 | SHL-4-FAL20 | Dissolved | Water | 6020A | 644204 |
| 680-191554-7 | SHM-10-04-FAL20 | Dissolved | Water | 6020A | 644204 |
| 680-191554-8 | SHM-10-05A-FAL20 | Dissolved | Water | 6020A | 644204 |
| 680-191554-9 | SHM-10-11-FAL20 | Dissolved | Water | 6020A | 644204 |
| 680-191554-10 | SHM-10-16-FAL20 | Dissolved | Water | 6020A | 644204 |
| 680-191554-11 | SHM-93-18B-FAL20 | Dissolved | Water | 6020A | 644204 |
| 680-191554-12 | SHP-2016-06A-FAL20 | Dissolved | Water | 6020A | 644204 |
| MB 680-644204/1-A | Method Blank | Total Recoverable | Water | 6020A | 644204 |
| LCS 680-644204/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 644204 |
| 680-191554-7 MS | SHM-10-04-FAL20 | Dissolved | Water | 6020A | 644204 |
| 680-191554-7 MSD | SHM-10-04-FAL20 | Dissolved | Water | 6020A | 644204 |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Metals

### Analysis Batch: 644289

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191554-13 | SHP-2016-06B-FAL20 | Dissolved | Water | 6020A | 644180 |
| 680-191554-14 | SHP-2016-06C-FAL20 | Dissolved | Water | 6020A | 644180 |
| 680-191554-15 | SHL-RB3-FAL20 | Dissolved | Water | 6020A | 644180 |
| MB 680-644180/1-A | Method Blank | Total Recoverable | Water | 6020A | 644180 |
| LCS 680-644180/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 644180 |

### Analysis Batch: 644415

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191554-1 | SHL-DUP06-FAL20 | Dissolved | Water | 6010C | 644205 |
| 680-191554-2 | SHM-10-06A-FAL20 | Dissolved | Water | 6010C | 644205 |
| 680-191554-3 | SHL-RB4-FAL20 | Dissolved | Water | 6010C | 644205 |
| 680-191554-4 | SHP-2016-07B-FAL20 | Dissolved | Water | 6010C | 644205 |
| 680-191554-5 | SHL-23-FAL20 | Dissolved | Water | 6010C | 644205 |
| 680-191554-6 | SHL-4-FAL20 | Dissolved | Water | 6010C | 644205 |
| 680-191554-7 | SHM-10-04-FAL20 | Dissolved | Water | 6010C | 644205 |
| 680-191554-8 | SHM-10-05A-FAL20 | Dissolved | Water | 6010C | 644205 |
| 680-191554-9 | SHM-10-11-FAL20 | Dissolved | Water | 6010C | 644205 |
| 680-191554-10 | SHM-10-16-FAL20 | Dissolved | Water | 6010C | 644205 |
| 680-191554-11 | SHM-93-18B-FAL20 | Dissolved | Water | 6010C | 644205 |
| 680-191554-12 | SHP-2016-06A-FAL20 | Dissolved | Water | 6010C | 644205 |
| 680-191554-13 | SHP-2016-06B-FAL20 | Dissolved | Water | 6010C | 644181 |
| 680-191554-14 | SHP-2016-06C-FAL20 | Dissolved | Water | 6010C | 644181 |
| 680-191554-15 | SHL-RB3-FAL20 | Dissolved | Water | 6010C | 644181 |
| MB 680-644181/1-A | Method Blank | Total Recoverable | Water | 6010C | 644181 |
| MB 680-644205/1-A | Method Blank | Total Recoverable | Water | 6010C | 644205 |
| LCS 680-644181/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 644181 |
| LCS 680-644205/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 644205 |
| 680-191554-7 MS | SHM-10-04-FAL20 | Dissolved | Water | 6010C | 644205 |
| 680-191554-7 MSD | SHM-10-04-FAL20 | Dissolved | Water | 6010C | 644205 |

## General Chemistry

### Analysis Batch: 517299

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191554-1 | SHL-DUP06-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191554-2 | SHM-10-06A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191554-4 | SHP-2016-07B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191554-5 | SHL-23-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191554-6 | SHL-4-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191554-7 | SHM-10-04-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191554-8 | SHM-10-05A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191554-9 | SHM-10-11-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191554-10 | SHM-10-16-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191554-11 | SHM-93-18B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191554-12 | SHP-2016-06A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191554-13 | SHP-2016-06B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191554-14 | SHP-2016-06C-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-517299/57 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-517299/56 | Lab Control Sample | Total/NA | Water | SM 2320B | |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## General Chemistry

### Analysis Batch: 517972

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191554-1 | SHL-DUP06-FAL20 | Dissolved | Water | 9060A | |
| 680-191554-2 | SHM-10-06A-FAL20 | Dissolved | Water | 9060A | |
| 680-191554-4 | SHP-2016-07B-FAL20 | Dissolved | Water | 9060A | |
| 680-191554-5 | SHL-23-FAL20 | Dissolved | Water | 9060A | |
| 680-191554-6 | SHL-4-FAL20 | Dissolved | Water | 9060A | |
| 680-191554-7 | SHM-10-04-FAL20 | Dissolved | Water | 9060A | |
| 680-191554-8 | SHM-10-05A-FAL20 | Dissolved | Water | 9060A | |
| 680-191554-9 | SHM-10-11-FAL20 | Dissolved | Water | 9060A | |
| 680-191554-10 | SHM-10-16-FAL20 | Dissolved | Water | 9060A | |
| 680-191554-11 | SHM-93-18B-FAL20 | Dissolved | Water | 9060A | |
| 680-191554-12 | SHP-2016-06A-FAL20 | Dissolved | Water | 9060A | |
| MB 280-517972/35 | Method Blank | Dissolved | Water | 9060A | |
| MB 280-517972/4 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-517972/3 | Lab Control Sample | Dissolved | Water | 9060A | |
| LCS 280-517972/34 | Lab Control Sample | Dissolved | Water | 9060A | |
| 680-191554-7 MS | SHM-10-04-FAL20 | Dissolved | Water | 9060A | |
| 680-191554-7 MSD | SHM-10-04-FAL20 | Dissolved | Water | 9060A | |

### Analysis Batch: 518157

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191554-14 | SHP-2016-06C-FAL20 | Dissolved | Water | 9060A | |
| MB 280-518157/36 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-518157/35 | Lab Control Sample | Dissolved | Water | 9060A | |

### Analysis Batch: 518567

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191554-13 | SHP-2016-06B-FAL20 | Dissolved | Water | 9060A | |
| MB 280-518567/4 | Method Blank | Dissolved | Water | 9060A | |
| MB 280-518567/68 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-518567/3 | Lab Control Sample | Dissolved | Water | 9060A | |
| LCS 280-518567/67 | Lab Control Sample | Dissolved | Water | 9060A | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Client Sample ID: SHL-DUP06-FAL20

**Lab Sample ID: 680-191554-1**

**Date Collected: 11/13/20 09:15**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 17:35 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644205 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 11:18 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644204 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644283 | 11/16/20 17:07 | BJB | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/21/20 23:54 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 18:21 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-10-06A-FAL20

**Lab Sample ID: 680-191554-2**

**Date Collected: 11/13/20 11:45**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 17:48 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644205 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 11:27 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644204 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644283 | 11/16/20 17:14 | BJB | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 00:15 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 18:26 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHL-RB4-FAL20

**Lab Sample ID: 680-191554-3**

**Date Collected: 11/13/20 12:50**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644205 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 11:40 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644204 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644283 | 11/16/20 17:25 | BJB | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Client Sample ID: SHP-2016-07B-FAL20

**Lab Sample ID: 680-191554-4**

**Date Collected: 11/13/20 09:00**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 19:04 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644205 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 11:31 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644204 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644283 | 11/16/20 17:18 | BJB | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 00:32 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 18:31 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHL-23-FAL20

**Lab Sample ID: 680-191554-5**

**Date Collected: 11/12/20 10:20**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 19:16 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644205 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 10:39 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644204 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644283 | 11/16/20 16:42 | BJB | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 00:48 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 18:36 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHL-4-FAL20

**Lab Sample ID: 680-191554-6**

**Date Collected: 11/12/20 11:00**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 19:29 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644205 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 11:22 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644204 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644283 | 11/16/20 17:11 | BJB | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Client Sample ID: SHL-4-FAL20

**Lab Sample ID: 680-191554-6**

**Date Collected: 11/12/20 11:00**
**Date Received: 11/14/20 10:30**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 01:39 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 18:41 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-10-04-FAL20

**Lab Sample ID: 680-191554-7**

**Date Collected: 11/12/20 13:25**
**Date Received: 11/14/20 10:30**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 18:26 | T1C | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644205 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 10:13 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644204 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644283 | 11/16/20 16:25 | BJB | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/21/20 23:05 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 18:57 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-10-05A-FAL20

**Lab Sample ID: 680-191554-8**

**Date Collected: 11/12/20 13:55**
**Date Received: 11/14/20 10:30**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 19:42 | T1C | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644205 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 11:00 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644204 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644283 | 11/16/20 16:49 | BJB | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 01:58 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 19:02 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Client Sample ID: SHM-10-11-FAL20

**Lab Sample ID: 680-191554-9**

**Date Collected: 11/12/20 11:20**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 19:54 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644205 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 11:36 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644204 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644283 | 11/16/20 17:21 | BJB | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 02:15 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 19:07 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-10-16-FAL20

**Lab Sample ID: 680-191554-10**

**Date Collected: 11/12/20 12:30**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 20:07 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644205 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 10:55 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644204 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644283 | 11/16/20 16:46 | BJB | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 02:32 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 19:14 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-93-18B-FAL20

**Lab Sample ID: 680-191554-11**

**Date Collected: 11/12/20 09:30**
**Matrix: Water**
**Date Received: 11/14/20 10:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 20:20 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644205 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 11:13 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644204 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644283 | 11/16/20 17:04 | BJB | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Client Sample ID: SHM-93-18B-FAL20

**Lab Sample ID: 680-191554-11**

**Date Collected: 11/12/20 09:30**
**Date Received: 11/14/20 10:30**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 02:49 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 19:19 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHP-2016-06A-FAL20

**Lab Sample ID: 680-191554-12**

**Date Collected: 11/12/20 11:40**
**Date Received: 11/14/20 10:30**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644486 | 11/18/20 20:32 | T1C | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644205 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 11:09 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644204 | 11/16/20 10:54 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644283 | 11/16/20 17:00 | BJB | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517972 | 11/22/20 03:58 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 19:25 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHP-2016-06B-FAL20

**Lab Sample ID: 680-191554-13**

**Date Collected: 11/12/20 13:40**
**Date Received: 11/14/20 10:30**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644793 | 11/19/20 16:57 | EKB | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/16/20 23:48 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 15:01 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518567 | 11/25/20 21:19 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 19:31 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Client Sample ID: SHP-2016-06C-FAL20

**Lab Sample ID: 680-191554-14**

**Date Collected: 11/12/20 15:25**
**Date Received: 11/14/20 10:30**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 644793 | 11/19/20 17:09 | EKB | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 00:04 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 15:04 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 518157 | 11/25/20 08:23 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 517299 | 11/18/20 19:36 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHL-RB3-FAL20

**Lab Sample ID: 680-191554-15**

**Date Collected: 11/12/20 11:20**
**Date Received: 11/14/20 10:30**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 644181 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 644415 | 11/17/20 00:09 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 644180 | 11/16/20 09:45 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 644289 | 11/16/20 15:07 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

## Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| ANAB | Dept. of Defense ELAP | L2463 | 09-22-22 |

## Laboratory: Eurofins TestAmerica, Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| A2LA | Dept. of Defense ELAP | 2907.01 | 10-31-21 |

# Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191554-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060A | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | TAL SAV |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

**…DY RECORD**

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| …er Fort Devens, Long Term Monitoring | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| …DEVENS-LTM | Contact: | |
| WB… | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-191554 Chain of Custody

**Boston #215**

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 37 | SHL-23-FAL20 | WG | | | | X | X | X | X | X | SHL-23 | N1 | 23.00 | 33.00 | | |
| 38 | SHL-24-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | N1 | 110.00 | 120.00 | | |
| 39 | SHL-3-FAL20 | WG | | | | X | X | X | X | X | SHL-3 | N1 | 24.00 | 34.00 | | |
| 40 | SHL-4-FAL20 | WG | | | | X | X | X | X | X | SHL-4 | N1 | 3.00 | 13.00 | | |
| 41 | SHL-5-FAL20 | WG | | | | X | X | X | X | X | SHL-5 | N1 | 3.00 | 13.00 | | |
| 42 | SHL-7-FAL20 | WG | | | | X | X | X | X | X | SHL-7 | N1 | 11.00 | 21.00 | | |
| 43 | SHL-8D-FAL20 | WG | | | | X | X | X | X | X | SHL-8D | N1 | 68.00 | 70.00 | | |
| 44 | SHL-8S-FAL20 | WG | | | | X | X | X | X | X | SHL-8S | N1 | 52.00 | 54.00 | | |
| 45 | SHL-9-FAL20 | WG | | | | X | X | X | X | X | SHL-9 | N1 | 15.00 | 25.00 | | |
| 46 | SHL-DUP01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | FD1 | 25.00 | 35.00 | | |
| 47 | SHL-DUP02-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | FD1 | 39.00 | 49.00 | | |
| 48 | SHL-DUP03-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | FD1 | 25.00 | 35.00 | | |
| 49 | SHL-DUP04-FAL20 | WG | | | CR | X | X | X | X | X | SHP-01-38A | FD1 | 1.50 | 6.50 | | |
| 50 | SHL-DUP05-FAL20 | WG | 11-13-20 | 915 | ~~DE~~ | X | X | X | X | X | SHP-2016-07A B | FD1 | 70.00 | 80.00 | | |
| 51 | SHL-DUP06-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | FD1 | 79.50 | 84.50 | | |
| 52 | SHL-DUP07-FAL20 | WG | | | | X | X | X | X | X | SHL-22 | FD1 | 105.00 | 115.00 | | |
| 53 | SHL-DUP08-FAL20 | WG | | | | X | X | X | X | X | SHM-96-5B | FD1 | 80.00 | 90.00 | | |
| 53 | SHL-DUP09-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | FD1 | 110.00 | 120.00 | | |

**Relinquished by:** D Redwood
**Date**
**Time**
**Received by:** 11/13/20 14:00
SHL_eCOC

Rcvd [signature] 11/13/20 @ 1400

**Date** Rlng [signature] 11/13/20 @ 1800
**Time**
**Shipping Date:** 11-14-20 1030
**Received by Laboratory** CSBauda
**Condition:** 2.5/1.8/1.6 (CF) 2.8/2.1/1.9°C

**JDY RECORD**

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

# Boston #215

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 69 | SHM-10-05A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-05A | N1 | 50.00 | 60.00 | | |
| 70 | SHM-10-06-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06 | N1 | 69.50 | 79.50 | | |
| 71 | SHM-10-06A-FAL20 | WG | 11-13-20 | 1145 | CR | X | X | X | X | X | SHM-10-06A | N1 | 77.00 | 87.00 | | |
| 72 | ~~SHM-10-07-FAL20~~ FB-SHL-FAL20 | ~~WG~~ | 11-13-20 | 1250 | CR | ~~X~~ | X | X | ~~X~~ | ~~X~~ | ~~SHM-10-07~~ | ~~N1~~ | ~~40.00~~ | ~~50.00~~ | | FB-SHL-FAL20 Metals only |
| 73 | SHM-10-08-FAL20 | WG | | | | X | X | X | X | X | SHM-10-08 | N1 | 46.00 | 56.00 | | |
| 74 | SHM-10-10-FAL20 | WG | | | | X | X | X | X | X | SHM-10-10 | N1 | 56.00 | 66.00 | | |
| 75 | SHM-10-11-FAL20 | WG | | | | X | X | X | X | X | SHM-10-11 | N1 | 50.00 | 60.00 | | |
| 76 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | MS1 | 45.00 | 55.00 | | |
| 77 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | N1 | 45.00 | 55.00 | | |
| 78 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | SD1 | 45.00 | 55.00 | | |
| 79 | SHM-10-13-FAL20 | WG | | | | X | X | X | X | X | SHM-10-13 | N1 | 60.00 | 70.00 | | |
| 80 | SHM-10-14-FAL20 | WG | | | | X | X | X | X | X | SHM-10-14 | N1 | 60.00 | 80.00 | | |
| 81 | SHM-10-15-FAL20 | WG | | | | X | X | X | X | X | SHM-10-15 | N1 | 45.00 | 55.00 | | |
| 82 | SHM-10-16-FAL20 | WG | | | | X | X | X | X | X | SHM-10-16 | N1 | 75.00 | 85.00 | | |
| 83 | SHM-11-02-FAL20 | WG | | | | X | X | X | X | X | SHM-11-02 | N1 | 52.00 | 66.00 | | |
| 84 | SHM-11-06-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | N1 | 25.00 | 35.00 | | |
| 85 | SHM-13-01-FAL20 | WG | | | | X | X | X | X | X | SHM-13-01 | N1 | 39.00 | 49.00 | | |
| 86 | SHM-13-02-FAL20 | WG | | | | X | X | X | X | X | SHM-13-02 | N1 | 60.00 | 70.00 | | |

**Relinquished by:**
**Date**
**Time**
Received by:
SHL_eCOC

D Bedard 11/13/20 14:00

Rcvd Sto Hart 11/13/20 1400

**Date**
**Time**
**Shipping Date:**
Received by Laboratory:
Condition:

Rlqd Sto Hart 11/13/20 1600

C Bauda 11-14-20 1030

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

**Boston #215**

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 103 | SHM-99-31A-FAL20 | WG | | | | X | X | X | X | X | SHM-99-31A | N1 | 4.00 | 14.00 | | |
| 104 | SHM-99-31B-FAL20 | WG | | | | X | X | X | X | X | SHM-99-31B | N1 | 50.00 | 60.00 | | |
| 105 | SHM-99-31C-FAL20 | WG | | | | X | X | X | X | X | SHM-99-31C | N1 | 68.00 | 78.00 | | |
| 106 | SHM-99-32X-FAL20 | WG | | | | X | X | X | X | X | SHM-99-32X | N1 | 72.00 | 82.00 | | |
| 107 | SHP-01-36X-FAL20 | WG | | | | X | X | X | X | X | SHP-01-36X | N1 | 3.00 | 8.00 | | |
| 108 | SHP-01-37X-FAL20 | WG | | | | X | X | X | X | X | SHP-01-37X | N1 | 1.00 | 6.00 | | |
| 109 | SHP-01-38A-FAL20 | WG | | | | X | X | X | X | X | SHP-01-38A | N1 | 1.50 | 6.50 | | |
| 110 | SHP-2016-06A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-06A | N1 | 81.00 | 86.00 | | |
| 111 | SHP-2016-06B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-06B | N1 | 102.00 | 112.00 | | |
| 112 | SHP-2016-06C-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-06C | N1 | 123.00 | 133.00 | | |
| 113 | SHP-2016-07A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | N1 | 22.00 | 32.00 | | |
| 114 | SHP-2016-07B-FAL20 | WG | 11-13-20 | 900 | CR | X | X | X | X | X | SHP-2016-07B | N1 | 70.00 | 80.00 | | |
| 115 | SHP-2016-1A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-1A | N1 | 13.00 | 23.00 | | |
| 116 | SHP-2016-1B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-1B | N1 | 75.00 | 85.00 | | |
| 117 | SHP-2016-2A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-2A | N1 | 20.00 | 25.00 | | |
| 118 | SHP-2016-2B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-2B | N1 | 80.00 | 85.00 | | |
| 119 | SHP-2016-3A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-3A | N1 | 20.00 | 25.00 | | |
| 120 | SHP-2016-3B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-3B | N1 | 80.00 | 85.00 | | |

**Relinquished by:** D Gerhard
**Date**
**Time**
Received by: 11/13/20 14:00
SHL_eCOC

Rcvd [signature] 11/13/20 1400
Rlqd 11/13/20 100

**Date**
**Time**
**Shipping Date:** RSBanda 11-14-20 1030
Received by Laboratory:
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

**Boston #215**

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 37 | SHL-23-FAL20 | WG | 11-12-20 | 1020 | DC | X | X | X | X | X | SHL-23 | N1 | 23.00 | 33.00 | | |
| 38 | SHL-24-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | N1 | 110.00 | 120.00 | | |
| 39 | SHL-3-FAL20 | WG | | | | X | X | X | X | X | SHL-3 | N1 | 24.00 | 34.00 | | |
| 40 | SHL-4-FAL20 | WG | 11-12-20 | 1100 | CR | X | X | X | X | X | SHL-4 | N1 | 3.00 | 13.00 | | |
| 41 | SHL-5-FAL20 | WG | | | | X | X | X | X | X | SHL-5 | N1 | 3.00 | 13.00 | | |
| 42 | SHL-7-FAL20 | WG | | | | X | X | X | X | X | SHL-7 | N1 | 11.00 | 21.00 | | |
| 43 | SHL-8D-FAL20 | WG | | | | X | X | X | X | X | SHL-8D | N1 | 68.00 | 70.00 | | |
| 44 | SHL-8S-FAL20 | WG | | | | X | X | X | X | X | SHL-8S | N1 | 52.00 | 54.00 | | |
| 45 | SHL-9-FAL20 | WG | | | | X | X | X | X | X | SHL-9 | N1 | 15.00 | 25.00 | | |
| 46 | SHL-DUP01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | FD1 | 25.00 | 35.00 | | |
| 47 | SHL-DUP02-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | FD1 | 39.00 | 49.00 | | |
| 48 | SHL-DUP03-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | FD1 | 25.00 | 35.00 | | |
| 49 | SHL-DUP04-FAL20 | WG | | | | X | X | X | X | X | SHP-01-38A | FD1 | 1.50 | 6.50 | | |
| 50 | SHL-DUP05-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | FD1 | 22.00 | 32.00 | | |
| 51 | SHL-DUP06-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | FD1 | 79.50 | 84.50 | | |
| 52 | SHL-DUP07-FAL20 | WG | | | | X | X | X | X | X | SHL-22 | FD1 | 105.00 | 115.00 | | |
| 53 | SHL-DUP08-FAL20 | WG | | | | X | X | X | X | X | SHM-96-5B | FD1 | 80.00 | 90.00 | | |
| 53 | SHL-DUP09-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | FD1 | 110.00 | 120.00 | | |

**Relinquished by:** D Bedard
**Date**
**Time**
Received by: 11/12/20 17:40 [signature]
SHL_eCOC

**Date**
**Time**
**Shipping Date:** [signature] 11/13/20 1700 ETA
Received by Laboratory: C S Banda 11-14-20 1030
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Boston #215

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 53 | SHL-DUP10-FAL20 | WG | | | | X | X | X | X | X | SHM-05-40X | FD1 | 32.00 | 34.00 | | |
| 54 | SHM-05-39A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-39A | N1 | 37.00 | 39.00 | | |
| 55 | SHM-05-39B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-39B | N1 | 66.00 | 68.00 | | |
| 56 | SHM-05-40X-FAL20 | WG | | | | X | X | X | X | X | SHM-05-40X | N1 | 32.00 | 34.00 | | |
| 57 | SHM-05-41A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41A | N1 | 42.00 | 44.00 | | |
| 58 | SHM-05-41B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41B | N1 | 62.00 | 64.00 | | |
| 59 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | MS1 | 88.00 | 93.00 | | |
| 60 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | N1 | 88.00 | 93.00 | | |
| 61 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | SD1 | 88.00 | 93.00 | | |
| 62 | SHM-05-42A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-42A | N1 | 40.00 | 42.00 | | |
| 63 | SHM-05-42B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-42B | N1 | 70.00 | 72.00 | | |
| 64 | SHM-07-03-FAL20 | WG | | | | X | X | X | X | X | SHM-07-03 | N1 | 25.00 | 35.00 | | |
| 65 | SHM-07-05X-FAL20 | WG | | | | X | X | X | X | X | SHM-07-05X | N1 | 55.00 | 65.00 | | |
| 66 | SHM-10-02-FAL20 | WG | | | | X | X | X | X | X | SHM-10-02 | N1 | 53.00 | 63.00 | | |
| 67 | SHM-10-03-FAL20 | WG | | | | X | X | X | X | X | SHM-10-03 | N1 | 58.50 | 68.50 | | |
| 68 | SHM-10-04-FAL20 | WG | 11-12-20 | 1325 | DB | X | X | X | X | X | SHM-10-04 | MS1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | 11-12-20 | 1325 | DB | X | X | X | X | X | SHM-10-04 | N1 | 55.00 | 65.00 | | |
| 68 | SHM-10-04-FAL20 | WG | 11-12-20 | 1325 | DB | X | X | X | X | X | SHM-10-04 | SD1 | 55.00 | 65.00 | | |

**Relinquished by:** [signature]
**Date** 11/12/20
**Time** 17:40
Received by: [signature]
SHL_eCOC

**Date** 11/13/20 1700 ETA
**Time**
**Shipping Date:**
Received by Laboratory: [signature] 11-14-20 1030
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Boston #215

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | | | | | | |
| 69 | SHM-10-05A-FAL20 | WG | 11-12-20 | 1355 | CR | X | X | X | X | X | | | | | | SHM-10-05A | N1 | 50.00 | 60.00 | | |
| 70 | SHM-10-06-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-06 | N1 | 69.50 | 79.50 | | |
| 71 | SHM-10-06A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-06A | N1 | 77.00 | 87.00 | | |
| 72 | SHM-10-07-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-07 | N1 | 40.00 | 50.00 | | |
| 73 | SHM-10-08-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-08 | N1 | 46.00 | 56.00 | | |
| 74 | SHM-10-10-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-10 | N1 | 56.00 | 66.00 | | |
| 75 | SHM-10-11-FAL20 | WG | 11-12-20 | 1120 | DB | X | X | X | X | X | | | | | | SHM-10-11 | N1 | 50.00 | 60.00 | | |
| 76 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-12 | MS1 | 45.00 | 55.00 | | |
| 77 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-12 | N1 | 45.00 | 55.00 | | |
| 78 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-12 | SD1 | 45.00 | 55.00 | | |
| 79 | SHM-10-13-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-13 | N1 | 60.00 | 70.00 | | |
| 80 | SHM-10-14-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-14 | N1 | 60.00 | 80.00 | | |
| 81 | SHM-10-15-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-10-15 | N1 | 45.00 | 55.00 | | |
| 82 | SHM-10-16-FAL20 | WG | 11-12-20 | 1230 | CR | X | X | X | X | X | | | | | | SHM-10-16 | N1 | 75.00 | 85.00 | | |
| 83 | SHM-11-02-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-11-02 | N1 | 52.00 | 66.00 | | |
| 84 | SHM-11-06-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-11-06 | N1 | 25.00 | 35.00 | | |
| 85 | SHM-13-01-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-01 | N1 | 39.00 | 49.00 | | |
| 86 | SHM-13-02-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-02 | N1 | 60.00 | 70.00 | | |

**Relinquished by:** D Chapman
**Date**
**Time**
Received by: SHL_eCOC 11/12/20 17:40

**Date**
**Time**
**Shipping Date:** 11/13/20 1700 ETL
Received by Laboratory: 11-14-20 1030
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Bostor #215

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 87 | SHM-13-03-FAL20 | WG | | | | X | X | X | X | X | SHM-13-03 | N1 | 42.00 | 52.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | MS1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | N1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | SHM-13-04 | SD1 | 20.00 | 30.00 | | |
| 89 | SHM-13-05-FAL20 | WG | | | | X | X | X | X | X | SHM-13-05 | N1 | 75.00 | 85.00 | | |
| 90 | SHM-13-06-FAL20 | WG | | | | X | X | X | X | X | SHM-13-06 | N1 | 36.00 | 46.00 | | |
| 91 | SHM-13-07-FAL20 | WG | | | | X | X | X | X | X | SHM-13-07 | N1 | 27.00 | 37.00 | | |
| 92 | SHM-13-08-FAL20 | WG | | | | X | X | X | X | X | SHM-13-08 | N1 | 55.00 | 65.00 | | |
| 93 | SHM-13-14D-FAL20 | WG | | | | X | X | X | X | X | SHM-13-14D | N1 | 45.00 | 55.00 | | |
| 94 | SHM-13-14S-FAL20 | WG | | | | X | X | X | X | X | SHM-13-14S | N1 | 5.00 | 15.00 | | |
| 95 | SHM-13-15-FAL20 | WG | | | | X | X | X | X | X | SHM-13-15 | N1 | 50.00 | 60.00 | | |
| 96 | SHM-93-10D-FAL20 | WG | | | | X | X | X | X | X | SHM-93-10D | N1 | 48.70 | 58.70 | | |
| 97 | SHM-93-18B-FAL20 | WG | 11-12-20 | 930 | CR | X | X | X | X | X | SHM-93-18B | N1 | 78.50 | 88.50 | | |
| 98 | SHM-93-22B-FAL20 | WG | | | | X | X | X | X | X | SHM-93-22B | N1 | 82.30 | 92.30 | | |
| 99 | SHM-93-22C-FAL20 | WG | | | | X | X | X | X | X | SHM-93-22C | N1 | 124.30 | 134.30 | | |
| 100 | SHM-93-24A-FAL20 | WG | | | | X | X | X | X | X | SHM-93-24A | N1 | 13.20 | 23.20 | | |
| 101 | SHM-96-5B-FAL20 | WG | | | | X | X | X | X | X | SHM-96-5B | N1 | 80.00 | 90.00 | | |
| 102 | SHM-96-5C-FAL20 | WG | | | | X | X | X | X | X | SHM-96-5C | N1 | 50.00 | 60.00 | | |

**Relinquished by:** DKeland
**Date**
**Time**
**Received by:** 11/12/20 17:40 [signature]
SHL_eCOC

**Date**
**Time**
**Shipping Date:** [signature] 11/13/20 1700 ETA
**Received by Laboratory:** CSBanda 11-14-20 1030
**Condition:**

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
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**Boston #215**

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 103 | SHM-99-31A-FAL20 | WG | | | | X | X | X | X | X | SHM-99-31A | N1 | 4.00 | 14.00 | | |
| 104 | SHM-99-31B-FAL20 | WG | | | | X | X | X | X | X | SHM-99-31B | N1 | 50.00 | 60.00 | | |
| 105 | SHM-99-31C-FAL20 | WG | | | | X | X | X | X | X | SHM-99-31C | N1 | 68.00 | 78.00 | | |
| 106 | SHM-99-32X-FAL20 | WG | | | | X | X | X | X | X | SHM-99-32X | N1 | 72.00 | 82.00 | | |
| 107 | SHP-01-36X-FAL20 | WG | | | | X | X | X | X | X | SHP-01-36X | N1 | 3.00 | 8.00 | | |
| 108 | SHP-01-37X-FAL20 | WG | | | | X | X | X | X | X | SHP-01-37X | N1 | 1.00 | 6.00 | | |
| 109 | SHP-01-38A-FAL20 | WG | | | | X | X | X | X | X | SHP-01-38A | N1 | 1.50 | 6.50 | | |
| 110 | SHP-2016-06A-FAL20 | WG | 11-12-20 | 1140 | DC | X | X | X | X | X | SHP-2016-06A | N1 | 81.00 | 86.00 | | |
| 111 | SHP-2016-06B-FAL20 | WG | 11-12-20 | 1340 | DC | X | X | X | X | X | SHP-2016-06B | N1 | 102.00 | 112.00 | | |
| 112 | SHP-2016-06C-FAL20 | WG | 11-12-20 | 1525 | DC | X | X | X | X | X | SHP-2016-06C | N1 | 123.00 | 133.00 | | |
| 113 | SHP-2016-07A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | N1 | 22.00 | 32.00 | | |
| 114 | SHP-2016-07B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07B | N1 | 70.00 | 80.00 | | |
| 115 | SHP-2016-1A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-1A | N1 | 13.00 | 23.00 | | |
| 116 | SHP-2016-1B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-1B | N1 | 75.00 | 85.00 | | |
| 117 | SHP-2016-2A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-2A | N1 | 20.00 | 25.00 | | |
| 118 | SHP-2016-2B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-2B | N1 | 80.00 | 85.00 | | |
| 119 | SHP-2016-3A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-3A | N1 | 20.00 | 25.00 | | |
| 120 | ~~SHP-2016-3B-FAL20~~ FB-SHL-FAL20 | WG | 11-12-20 | 1120 | DC | ~~X~~ | X | X | ~~X~~ | ~~X~~ | SHP-2016-3B | N1 | 80.00 | 85.00 | | Metals only |

**Relinquished by:** DClyr
**Date**
**Time**
**Received by:** 11/12/20 17:40 [signature]
SHL_eCOC

**Date**
**Time**
**Shipping Date:** [signature] 11/13/20 1700 ETA
**Received by Laboratory:**
**Condition:** [signature] 11-14-20 1030

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191554-1

**Login Number: 191554**

**List Source: Eurofins TestAmerica, Savannah**

**List Number: 1**

**Creator: Banda, Christy S**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191554-1

**Login Number: 191554**
**List Number: 2**
**Creator: O'Hara, Jake F**

**List Source: Eurofins TestAmerica, Denver**
**List Creation: 11/17/20 05:36 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | N/A | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

eurofins | Environment Testing America

# ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-190620-1
Client Project/Site: Fort Devens
Revision: 1

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

*Authorized for release by:*
*11/30/2020 1:30:54 PM*

Kathryn Smith, Client Service Manager
(912)250-0275
Kathy.Smith@Eurofinset.com

LINKS

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*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

# Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

# Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 680-190620-1 | PZ-12-09-FAL20 | Water | 10/26/20 11:40 | 10/28/20 09:50 | |
| 680-190620-2 | PZ-12-10-FAL20 | Water | 10/26/20 09:40 | 10/28/20 09:50 | |
| 680-190620-3 | SHL-19-FAL20 | Water | 10/26/20 14:50 | 10/28/20 09:50 | |
| 680-190620-4 | SHM-93-24A-FAL20 | Water | 10/26/20 15:30 | 10/28/20 09:50 | |
| 680-190620-5 | SHL-24-FAL20 | Water | 10/26/20 15:15 | 10/28/20 09:50 | |
| 680-190620-6 | SHL-DUP09-FAL20 | Water | 10/26/20 15:15 | 10/28/20 09:50 | |
| 680-190620-7 | SHM-05-39A-FAL20 | Water | 10/26/20 13:10 | 10/28/20 09:50 | |
| 680-190620-8 | SHM-05-39B-FAL20 | Water | 10/26/20 13:00 | 10/28/20 09:50 | |

## Job ID: 680-190620-1

**Laboratory: Eurofins TestAmerica, Savannah**

**Narrative**

# CASE NARRATIVE
# Client: Seres Engineering & Services LLC
# Project: Fort Devens

## Report Number: 680-190620-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 10/28/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.3º C and 2.4º C.

**METALS (ICP) - DISSOLVED**
Samples PZ-12-09-FAL20 (680-190620-1), PZ-12-10-FAL20 (680-190620-2), SHL-19-FAL20 (680-190620-3), SHM-93-24A-FAL20 (680-190620-4), SHL-24-FAL20 (680-190620-5), SHL-DUP09-FAL20 (680-190620-6), SHM-05-39A-FAL20 (680-190620-7) and SHM-05-39B-FAL20 (680-190620-8) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 10/29/2020 and analyzed on 10/31/2020.

Iron was detected in method blank MB 680-641425/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Iron and Manganese recovered low for the MSD of sample PZ-12-10-FAL20 (680-190620-2) in batch 680-641904.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples PZ-12-09-FAL20 (680-190620-1), PZ-12-10-FAL20 (680-190620-2), SHL-19-FAL20 (680-190620-3), SHM-93-24A-FAL20 (680-190620-4), SHL-24-FAL20 (680-190620-5), SHL-DUP09-FAL20 (680-190620-6), SHM-05-39A-FAL20 (680-190620-7) and SHM-05-39B-FAL20 (680-190620-8) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 10/29/2020 and analyzed on 10/30/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples PZ-12-09-FAL20 (680-190620-1), PZ-12-10-FAL20 (680-190620-2), SHL-19-FAL20 (680-190620-3), SHM-93-24A-FAL20 (680-190620-4), SHL-24-FAL20 (680-190620-5), SHL-DUP09-FAL20 (680-190620-6), SHM-05-39A-FAL20 (680-190620-7) and SHM-05-39B-FAL20 (680-190620-8) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 11/04/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**
Samples PZ-12-09-FAL20 (680-190620-1), PZ-12-10-FAL20 (680-190620-2), SHL-19-FAL20 (680-190620-3), SHM-93-24A-FAL20 (680-190620-4), SHL-24-FAL20 (680-190620-5), SHL-DUP09-FAL20 (680-190620-6), SHM-05-39A-FAL20 (680-190620-7) and SHM-05-39B-FAL20 (680-190620-8) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 11/03/2020 and 11/05/2020.

Sample SHM-05-39B-FAL20 (680-190620-8)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

## Job ID: 680-190620-1 (Continued)

### Laboratory: Eurofins TestAmerica, Savannah (Continued)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL ORGANIC CARBON (TOC)**

Samples PZ-12-09-FAL20 (680-190620-1), PZ-12-10-FAL20 (680-190620-2), SHL-19-FAL20 (680-190620-3), SHM-93-24A-FAL20 (680-190620-4), SHL-24-FAL20 (680-190620-5), SHL-DUP09-FAL20 (680-190620-6), SHM-05-39A-FAL20 (680-190620-7) and SHM-05-39B-FAL20 (680-190620-8) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 11/07/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

## Client Sample ID: PZ-12-09-FAL20

**Lab Sample ID: 680-190620-1**
**Date Collected: 10/26/20 11:40**
**Matrix: Water**
**Date Received: 10/28/20 09:50**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.1 | | 0.50 | 0.20 | mg/L | | | 11/03/20 14:10 | 1 |
| Sulfate | 10 | M | 1.0 | 0.40 | mg/L | | | 11/03/20 14:10 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 10/29/20 13:36 | 10/31/20 14:10 | 1 |
| Manganese | 14 | | 10 | 1.0 | ug/L | | 10/29/20 13:36 | 10/31/20 14:10 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.6 | J | 3.0 | 1.5 | ug/L | | 10/29/20 13:36 | 10/30/20 13:29 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 110 | | 10 | 3.1 | mg/L | | | 11/04/20 22:38 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.46 | J | 1.0 | 0.35 | mg/L | | | 11/07/20 16:46 | 1 |

## Client Sample ID: PZ-12-10-FAL20

**Lab Sample ID: 680-190620-2**
**Date Collected: 10/26/20 09:40**
**Matrix: Water**
**Date Received: 10/28/20 09:50**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.44 | J | 0.50 | 0.20 | mg/L | | | 11/03/20 17:07 | 1 |
| Sulfate | 9.7 | M | 1.0 | 0.40 | mg/L | | | 11/03/20 17:07 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U J | 50 | 17 | ug/L | | 10/29/20 13:36 | 10/31/20 14:29 | 1 |
| Manganese | 1.0 | U J | 10 | 1.0 | ug/L | | 10/29/20 13:36 | 10/31/20 14:29 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 10/29/20 13:36 | 10/30/20 13:44 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 30 | | 10 | 3.1 | mg/L | | | 11/04/20 22:43 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.94 | J | 1.0 | 0.35 | mg/L | | | 11/07/20 20:49 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

## Client Sample ID: SHL-19-FAL20

**Lab Sample ID: 680-190620-3**
**Date Collected: 10/26/20 14:50**
**Matrix: Water**
**Date Received: 10/28/20 09:50**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.92 | | 0.50 | 0.20 | mg/L | | | 11/03/20 14:48 | 1 |
| Sulfate | 19 | M | 1.0 | 0.40 | mg/L | | | 11/03/20 14:48 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 10/29/20 13:36 | 10/31/20 14:59 | 1 |
| Manganese | 15 | | 10 | 1.0 | ug/L | | 10/29/20 13:36 | 10/31/20 14:59 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 10/29/20 13:36 | 10/30/20 14:08 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 88 | | 10 | 3.1 | mg/L | | | 11/04/20 22:48 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.0 | | 1.0 | 0.35 | mg/L | | | 11/07/20 17:35 | 1 |

## Client Sample ID: SHM-93-24A-FAL20

**Lab Sample ID: 680-190620-4**
**Date Collected: 10/26/20 15:30**
**Matrix: Water**
**Date Received: 10/28/20 09:50**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 190 | | 0.50 | 0.20 | mg/L | | | 11/03/20 15:01 | 1 |
| Sulfate | 55 | | 1.0 | 0.40 | mg/L | | | 11/03/20 15:01 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 10/29/20 13:36 | 10/31/20 15:07 | 1 |
| Manganese | 6.4 | J | 10 | 1.0 | ug/L | | 10/29/20 13:36 | 10/31/20 15:07 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 10/29/20 13:36 | 10/30/20 14:15 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 25 | | 10 | 3.1 | mg/L | | | 11/04/20 22:53 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.68 | J | 1.0 | 0.35 | mg/L | | | 11/07/20 17:51 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

## Client Sample ID: SHL-24-FAL20

**Lab Sample ID: 680-190620-5**

**Date Collected: 10/26/20 15:15**
**Date Received: 10/28/20 09:50**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 39 | | 0.50 | 0.20 | mg/L | | | 11/03/20 19:58 | 1 |
| Sulfate | 24 | | 1.0 | 0.40 | mg/L | | | 11/03/20 19:58 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 10/29/20 13:36 | 10/31/20 15:03 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 10/29/20 13:36 | 10/31/20 15:03 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.9 | | 3.0 | 1.5 | ug/L | | 10/29/20 13:36 | 10/30/20 14:11 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 50 | | 10 | 3.1 | mg/L | | | 11/04/20 22:57 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/07/20 18:10 | 1 |

## Client Sample ID: SHL-DUP09-FAL20

**Lab Sample ID: 680-190620-6**

**Date Collected: 10/26/20 15:15**
**Date Received: 10/28/20 09:50**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 39 | | 0.50 | 0.20 | mg/L | | | 11/03/20 20:37 | 1 |
| Sulfate | 24 | | 1.0 | 0.40 | mg/L | | | 11/03/20 20:37 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 10/29/20 13:36 | 10/31/20 14:55 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 10/29/20 13:36 | 10/31/20 14:55 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 4.1 | | 3.0 | 1.5 | ug/L | | 10/29/20 13:36 | 10/30/20 14:05 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 52 | | 10 | 3.1 | mg/L | | | 11/04/20 23:14 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/07/20 18:27 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

## Client Sample ID: SHM-05-39A-FAL20

**Lab Sample ID: 680-190620-7**
**Date Collected: 10/26/20 13:10**
**Matrix: Water**
**Date Received: 10/28/20 09:50**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 26 | | 0.50 | 0.20 | mg/L | | | 11/03/20 15:14 | 1 |
| Sulfate | 5.2 | | 1.0 | 0.40 | mg/L | | | 11/03/20 15:14 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 150 | | 50 | 17 | ug/L | | 10/29/20 13:36 | 10/31/20 14:48 | 1 |
| Manganese | 96 | | 10 | 1.0 | ug/L | | 10/29/20 13:36 | 10/31/20 14:48 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7.3 | | 3.0 | 1.5 | ug/L | | 10/29/20 13:36 | 10/30/20 13:59 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 59 | | 10 | 3.1 | mg/L | | | 11/04/20 23:19 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.1 | | 1.0 | 0.35 | mg/L | | | 11/07/20 18:44 | 1 |

## Client Sample ID: SHM-05-39B-FAL20

**Lab Sample ID: 680-190620-8**
**Date Collected: 10/26/20 13:00**
**Matrix: Water**
**Date Received: 10/28/20 09:50**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 7.8 | | 1.0 | 0.40 | mg/L | | | 11/05/20 01:16 | 1 |

### Method: 9056A - Anions, Ion Chromatography - DL

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 240 | | 5.0 | 2.0 | mg/L | | | 11/05/20 13:03 | 10 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 15000 | | 50 | 17 | ug/L | | 10/29/20 13:36 | 10/31/20 14:51 | 1 |
| Manganese | 760 | | 10 | 1.0 | ug/L | | 10/29/20 13:36 | 10/31/20 14:51 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 420 | | 3.0 | 1.5 | ug/L | | 10/29/20 13:36 | 10/30/20 14:02 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 58 | | 10 | 3.1 | mg/L | | | 11/04/20 23:23 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.3 | | 1.0 | 0.35 | mg/L | | | 11/07/20 19:01 | 1 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-642089/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642089**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/03/20 12:08 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/03/20 12:08 | 1 |

**Lab Sample ID: LCS 680-642089/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642089**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.97 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 9.79 | | mg/L | | 98 | 87 - 112 |

**Lab Sample ID: LCSD 680-642089/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642089**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.96 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 9.86 | | mg/L | | 99 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-190620-1 MS** — **Client Sample ID: PZ-12-09-FAL20 MS**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642089**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.1 | | 10.0 | 10.7 | | mg/L | | 96 | 87 - 111 |
| Sulfate | 10 | M | 10.0 | 19.7 | M | mg/L | | 94 | 87 - 112 |

**Lab Sample ID: 680-190620-1 MSD** — **Client Sample ID: PZ-12-09-FAL20 MSD**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642089**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.1 | | 10.0 | 11.2 | | mg/L | | 102 | 87 - 111 | 5 | 15 |
| Sulfate | 10 | M | 10.0 | 20.5 | M | mg/L | | 102 | 87 - 112 | 4 | 15 |

**Lab Sample ID: 680-190620-2 MS** — **Client Sample ID: PZ-12-10-FAL20 MS**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642089**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.44 | J | 10.0 | 10.4 | | mg/L | | 99 | 87 - 111 |
| Sulfate | 9.7 | M | 10.0 | 19.9 | M | mg/L | | 102 | 87 - 112 |

**Lab Sample ID: 680-190620-2 MSD** — **Client Sample ID: PZ-12-10-FAL20 MSD**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642089**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.44 | J | 10.0 | 10.5 | | mg/L | | 100 | 87 - 111 | 1 | 15 |
| Sulfate | 9.7 | M | 10.0 | 20.0 | M | mg/L | | 103 | 87 - 112 | 1 | 15 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-642137/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642137**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/03/20 12:12 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/03/20 12:12 | 1 |

**Lab Sample ID: LCS 680-642137/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642137**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.96 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 10.2 | | mg/L | | 102 | 87 - 112 |

**Lab Sample ID: LCSD 680-642137/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642137**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.98 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.3 | | mg/L | | 103 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-190620-5 MS** — **Client Sample ID: SHL-24-FAL20**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642137**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 39 | | 10.0 | 48.9 | | mg/L | | 99 | 87 - 111 |
| Sulfate | 24 | | 10.0 | 34.4 | | mg/L | | 100 | 87 - 112 |

**Lab Sample ID: 680-190620-5 MSD** — **Client Sample ID: SHL-24-FAL20**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642137**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 39 | | 10.0 | 48.9 | | mg/L | | 99 | 87 - 111 | 0 | 15 |
| Sulfate | 24 | | 10.0 | 34.6 | | mg/L | | 102 | 87 - 112 | 0 | 15 |

**Lab Sample ID: MB 680-642353/33** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642353**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/04/20 22:19 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/04/20 22:19 | 1 |

**Lab Sample ID: LCS 680-642353/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642353**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.0 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 9.90 | | mg/L | | 99 | 87 - 112 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: LCSD 680-642353/35**
**Matrix: Water**
**Analysis Batch: 642353**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.0 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 9.91 | | mg/L | | 99 | 87 - 112 | 0 | 15 |

**Lab Sample ID: MB 680-642486/2**
**Matrix: Water**
**Analysis Batch: 642486**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/05/20 09:08 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/05/20 09:08 | 1 |

**Lab Sample ID: LCS 680-642486/3**
**Matrix: Water**
**Analysis Batch: 642486**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.96 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: LCSD 680-642486/4**
**Matrix: Water**
**Analysis Batch: 642486**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.95 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 | 0 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-641425/1-A**
**Matrix: Water**
**Analysis Batch: 641904**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 641425**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 19.7 | J | 50 | 17 | ug/L | | 10/29/20 13:36 | 10/31/20 14:02 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 10/29/20 13:36 | 10/31/20 14:02 | 1 |

**Lab Sample ID: LCS 680-641425/2-A**
**Matrix: Water**
**Analysis Batch: 641904**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 641425**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4760 | | ug/L | | 95 | 87 - 115 |
| Manganese | 400 | 384 | | ug/L | | 96 | 90 - 114 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 680-190620-1 MS** — **Client Sample ID: PZ-12-09-FAL20 MS**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 641904** — **Prep Batch: 641425**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 5000 | 4630 | | ug/L | | 93 | 87 - 115 |
| Manganese | 14 | | 400 | 385 | | ug/L | | 93 | 90 - 114 |

**Lab Sample ID: 680-190620-1 MSD** — **Client Sample ID: PZ-12-09-FAL20 MSD**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 641904** — **Prep Batch: 641425**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 5000 | 4670 | | ug/L | | 93 | 87 - 115 | 1 | 20 |
| Manganese | 14 | | 400 | 388 | | ug/L | | 94 | 90 - 114 | 1 | 20 |

**Lab Sample ID: 680-190620-2 MS** — **Client Sample ID: PZ-12-10-FAL20 MS**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 641904** — **Prep Batch: 641425**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U J | 5000 | 4500 | | ug/L | | 90 | 87 - 115 |
| Manganese | 1.0 | U J | 400 | 364 | | ug/L | | 91 | 90 - 114 |

**Lab Sample ID: 680-190620-2 MSD** — **Client Sample ID: PZ-12-10-FAL20 MSD**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 641904** — **Prep Batch: 641425**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U J | 5000 | 4260 | J | ug/L | | 85 | 87 - 115 | 6 | 20 |
| Manganese | 1.0 | U J | 400 | 345 | J | ug/L | | 86 | 90 - 114 | 6 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-641424/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 641672** — **Prep Batch: 641424**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 10/29/20 13:36 | 10/30/20 13:23 | 1 |

**Lab Sample ID: LCS 680-641424/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 641672** — **Prep Batch: 641424**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 108 | | ug/L | | 108 | 84 - 116 |

**Lab Sample ID: 680-190620-1 MS** — **Client Sample ID: PZ-12-09-FAL20 MS**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 641672** — **Prep Batch: 641424**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.6 | J | 100 | 108 | | ug/L | | 107 | 84 - 116 |

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: 680-190620-1 MSD** — **Client Sample ID: PZ-12-09-FAL20 MSD**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 641672** — **Prep Batch: 641424**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.6 | J | 100 | 106 | | ug/L | | 104 | 84 - 116 | 2 | 20 |

**Lab Sample ID: 680-190620-2 MS** — **Client Sample ID: PZ-12-10-FAL20 MS**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 641672** — **Prep Batch: 641424**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 100 | 105 | | ug/L | | 105 | 84 - 116 | | |

**Lab Sample ID: 680-190620-2 MSD** — **Client Sample ID: PZ-12-10-FAL20 MSD**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 641672** — **Prep Batch: 641424**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 100 | 97.7 | | ug/L | | 98 | 84 - 116 | 7 | 20 |

## Method: 9060A - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-516057/4** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516057**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/07/20 16:12 | 1 |

**Lab Sample ID: LCS 280-516057/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516057**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | | | 25.0 | 24.5 | | mg/L | | 98 | 88 - 112 | | |

**Lab Sample ID: 680-190620-1 MS** — **Client Sample ID: PZ-12-09-FAL20 MS**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516057**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.46 | J | 25.0 | 25.5 | | mg/L | | 100 | 88 - 112 | | |

**Lab Sample ID: 680-190620-1 MSD** — **Client Sample ID: PZ-12-09-FAL20 MSD**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516057**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.46 | J | 25.0 | 25.4 | | mg/L | | 100 | 88 - 112 | 0 | 15 |

## Method: 9060A - Organic Carbon, Dissolved (DOC) (Continued)

**Lab Sample ID: 680-190620-2 MS**
**Matrix: Water**
**Analysis Batch: 516057**

**Client Sample ID: PZ-12-10-FAL20 MS**
**Prep Type: Dissolved**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.94 | J | 25.0 | 25.9 | | mg/L | | 100 | 88 - 112 | | |

**Lab Sample ID: 680-190620-2 MSD**
**Matrix: Water**
**Analysis Batch: 516057**

**Client Sample ID: PZ-12-10-FAL20 MSD**
**Prep Type: Dissolved**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.94 | J | 25.0 | 25.8 | | mg/L | | 99 | 88 - 112 | 1 | 15 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-515502/84**
**Matrix: Water**
**Analysis Batch: 515502**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/04/20 22:06 | 1 |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

## HPLC/IC

### Analysis Batch: 642089

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190620-1 | PZ-12-09-FAL20 | Total/NA | Water | 9056A | |
| 680-190620-2 | PZ-12-10-FAL20 | Total/NA | Water | 9056A | |
| 680-190620-3 | SHL-19-FAL20 | Total/NA | Water | 9056A | |
| 680-190620-4 | SHM-93-24A-FAL20 | Total/NA | Water | 9056A | |
| 680-190620-7 | SHM-05-39A-FAL20 | Total/NA | Water | 9056A | |
| MB 680-642089/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-642089/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-642089/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-190620-1 MS | PZ-12-09-FAL20 MS | Total/NA | Water | 9056A | |
| 680-190620-1 MSD | PZ-12-09-FAL20 MSD | Total/NA | Water | 9056A | |
| 680-190620-2 MS | PZ-12-10-FAL20 MS | Total/NA | Water | 9056A | |
| 680-190620-2 MSD | PZ-12-10-FAL20 MSD | Total/NA | Water | 9056A | |

### Analysis Batch: 642137

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190620-5 | SHL-24-FAL20 | Total/NA | Water | 9056A | |
| 680-190620-6 | SHL-DUP09-FAL20 | Total/NA | Water | 9056A | |
| MB 680-642137/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-642137/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-642137/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-190620-5 MS | SHL-24-FAL20 | Total/NA | Water | 9056A | |
| 680-190620-5 MSD | SHL-24-FAL20 | Total/NA | Water | 9056A | |

### Analysis Batch: 642353

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190620-8 | SHM-05-39B-FAL20 | Total/NA | Water | 9056A | |
| MB 680-642353/33 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-642353/34 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-642353/35 | Lab Control Sample Dup | Total/NA | Water | 9056A | |

### Analysis Batch: 642486

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190620-8 - DL | SHM-05-39B-FAL20 | Total/NA | Water | 9056A | |
| MB 680-642486/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-642486/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-642486/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 641424

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190620-1 | PZ-12-09-FAL20 | Dissolved | Water | 3005A | |
| 680-190620-2 | PZ-12-10-FAL20 | Dissolved | Water | 3005A | |
| 680-190620-3 | SHL-19-FAL20 | Dissolved | Water | 3005A | |
| 680-190620-4 | SHM-93-24A-FAL20 | Dissolved | Water | 3005A | |
| 680-190620-5 | SHL-24-FAL20 | Dissolved | Water | 3005A | |
| 680-190620-6 | SHL-DUP09-FAL20 | Dissolved | Water | 3005A | |
| 680-190620-7 | SHM-05-39A-FAL20 | Dissolved | Water | 3005A | |
| 680-190620-8 | SHM-05-39B-FAL20 | Dissolved | Water | 3005A | |
| MB 680-641424/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-641424/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

## Metals (Continued)

### Prep Batch: 641424 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190620-1 MS | PZ-12-09-FAL20 MS | Dissolved | Water | 3005A | |
| 680-190620-1 MSD | PZ-12-09-FAL20 MSD | Dissolved | Water | 3005A | |
| 680-190620-2 MS | PZ-12-10-FAL20 MS | Dissolved | Water | 3005A | |
| 680-190620-2 MSD | PZ-12-10-FAL20 MSD | Dissolved | Water | 3005A | |

### Prep Batch: 641425

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190620-1 | PZ-12-09-FAL20 | Dissolved | Water | 3005A | |
| 680-190620-2 | PZ-12-10-FAL20 | Dissolved | Water | 3005A | |
| 680-190620-3 | SHL-19-FAL20 | Dissolved | Water | 3005A | |
| 680-190620-4 | SHM-93-24A-FAL20 | Dissolved | Water | 3005A | |
| 680-190620-5 | SHL-24-FAL20 | Dissolved | Water | 3005A | |
| 680-190620-6 | SHL-DUP09-FAL20 | Dissolved | Water | 3005A | |
| 680-190620-7 | SHM-05-39A-FAL20 | Dissolved | Water | 3005A | |
| 680-190620-8 | SHM-05-39B-FAL20 | Dissolved | Water | 3005A | |
| MB 680-641425/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-641425/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-190620-1 MS | PZ-12-09-FAL20 MS | Dissolved | Water | 3005A | |
| 680-190620-1 MSD | PZ-12-09-FAL20 MSD | Dissolved | Water | 3005A | |
| 680-190620-2 MS | PZ-12-10-FAL20 MS | Dissolved | Water | 3005A | |
| 680-190620-2 MSD | PZ-12-10-FAL20 MSD | Dissolved | Water | 3005A | |

### Analysis Batch: 641672

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190620-1 | PZ-12-09-FAL20 | Dissolved | Water | 6020A | 641424 |
| 680-190620-2 | PZ-12-10-FAL20 | Dissolved | Water | 6020A | 641424 |
| 680-190620-3 | SHL-19-FAL20 | Dissolved | Water | 6020A | 641424 |
| 680-190620-4 | SHM-93-24A-FAL20 | Dissolved | Water | 6020A | 641424 |
| 680-190620-5 | SHL-24-FAL20 | Dissolved | Water | 6020A | 641424 |
| 680-190620-6 | SHL-DUP09-FAL20 | Dissolved | Water | 6020A | 641424 |
| 680-190620-7 | SHM-05-39A-FAL20 | Dissolved | Water | 6020A | 641424 |
| 680-190620-8 | SHM-05-39B-FAL20 | Dissolved | Water | 6020A | 641424 |
| MB 680-641424/1-A | Method Blank | Total Recoverable | Water | 6020A | 641424 |
| LCS 680-641424/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 641424 |
| 680-190620-1 MS | PZ-12-09-FAL20 MS | Dissolved | Water | 6020A | 641424 |
| 680-190620-1 MSD | PZ-12-09-FAL20 MSD | Dissolved | Water | 6020A | 641424 |
| 680-190620-2 MS | PZ-12-10-FAL20 MS | Dissolved | Water | 6020A | 641424 |
| 680-190620-2 MSD | PZ-12-10-FAL20 MSD | Dissolved | Water | 6020A | 641424 |

### Analysis Batch: 641904

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190620-1 | PZ-12-09-FAL20 | Dissolved | Water | 6010C | 641425 |
| 680-190620-2 | PZ-12-10-FAL20 | Dissolved | Water | 6010C | 641425 |
| 680-190620-3 | SHL-19-FAL20 | Dissolved | Water | 6010C | 641425 |
| 680-190620-4 | SHM-93-24A-FAL20 | Dissolved | Water | 6010C | 641425 |
| 680-190620-5 | SHL-24-FAL20 | Dissolved | Water | 6010C | 641425 |
| 680-190620-6 | SHL-DUP09-FAL20 | Dissolved | Water | 6010C | 641425 |
| 680-190620-7 | SHM-05-39A-FAL20 | Dissolved | Water | 6010C | 641425 |
| 680-190620-8 | SHM-05-39B-FAL20 | Dissolved | Water | 6010C | 641425 |
| MB 680-641425/1-A | Method Blank | Total Recoverable | Water | 6010C | 641425 |
| LCS 680-641425/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 641425 |

## Metals (Continued)

### Analysis Batch: 641904 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190620-1 MS | PZ-12-09-FAL20 MS | Dissolved | Water | 6010C | 641425 |
| 680-190620-1 MSD | PZ-12-09-FAL20 MSD | Dissolved | Water | 6010C | 641425 |
| 680-190620-2 MS | PZ-12-10-FAL20 MS | Dissolved | Water | 6010C | 641425 |
| 680-190620-2 MSD | PZ-12-10-FAL20 MSD | Dissolved | Water | 6010C | 641425 |

## General Chemistry

### Analysis Batch: 515502

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190620-1 | PZ-12-09-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190620-2 | PZ-12-10-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190620-3 | SHL-19-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190620-4 | SHM-93-24A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190620-5 | SHL-24-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190620-6 | SHL-DUP09-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190620-7 | SHM-05-39A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190620-8 | SHM-05-39B-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-515502/84 | Method Blank | Total/NA | Water | SM 2320B | |

### Analysis Batch: 516057

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190620-1 | PZ-12-09-FAL20 | Dissolved | Water | 9060A | |
| 680-190620-2 | PZ-12-10-FAL20 | Dissolved | Water | 9060A | |
| 680-190620-3 | SHL-19-FAL20 | Dissolved | Water | 9060A | |
| 680-190620-4 | SHM-93-24A-FAL20 | Dissolved | Water | 9060A | |
| 680-190620-5 | SHL-24-FAL20 | Dissolved | Water | 9060A | |
| 680-190620-6 | SHL-DUP09-FAL20 | Dissolved | Water | 9060A | |
| 680-190620-7 | SHM-05-39A-FAL20 | Dissolved | Water | 9060A | |
| 680-190620-8 | SHM-05-39B-FAL20 | Dissolved | Water | 9060A | |
| MB 280-516057/4 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-516057/3 | Lab Control Sample | Dissolved | Water | 9060A | |
| 680-190620-1 MS | PZ-12-09-FAL20 MS | Dissolved | Water | 9060A | |
| 680-190620-1 MSD | PZ-12-09-FAL20 MSD | Dissolved | Water | 9060A | |
| 680-190620-2 MS | PZ-12-10-FAL20 MS | Dissolved | Water | 9060A | |
| 680-190620-2 MSD | PZ-12-10-FAL20 MSD | Dissolved | Water | 9060A | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

## Client Sample ID: PZ-12-09-FAL20

**Lab Sample ID: 680-190620-1**

**Date Collected: 10/26/20 11:40**
**Matrix: Water**
**Date Received: 10/28/20 09:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642089 | 11/03/20 14:10 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641425 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 641904 | 10/31/20 14:10 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641424 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 641672 | 10/30/20 13:29 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516057 | 11/07/20 16:46 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515502 | 11/04/20 22:38 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: PZ-12-10-FAL20

**Lab Sample ID: 680-190620-2**

**Date Collected: 10/26/20 09:40**
**Matrix: Water**
**Date Received: 10/28/20 09:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642089 | 11/03/20 17:07 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641425 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 641904 | 10/31/20 14:29 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641424 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 641672 | 10/30/20 13:44 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516057 | 11/07/20 20:49 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515502 | 11/04/20 22:43 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHL-19-FAL20

**Lab Sample ID: 680-190620-3**

**Date Collected: 10/26/20 14:50**
**Matrix: Water**
**Date Received: 10/28/20 09:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642089 | 11/03/20 14:48 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641425 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 641904 | 10/31/20 14:59 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641424 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 641672 | 10/30/20 14:08 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

## Client Sample ID: SHL-19-FAL20

**Lab Sample ID: 680-190620-3**

**Date Collected: 10/26/20 14:50**
**Date Received: 10/28/20 09:50**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516057 | 11/07/20 17:35 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515502 | 11/04/20 22:48 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-93-24A-FAL20

**Lab Sample ID: 680-190620-4**

**Date Collected: 10/26/20 15:30**
**Date Received: 10/28/20 09:50**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642089 | 11/03/20 15:01 | T1C | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641425 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 641904 | 10/31/20 15:07 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641424 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 641672 | 10/30/20 14:15 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516057 | 11/07/20 17:51 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515502 | 11/04/20 22:53 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHL-24-FAL20

**Lab Sample ID: 680-190620-5**

**Date Collected: 10/26/20 15:15**
**Date Received: 10/28/20 09:50**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642137 | 11/03/20 19:58 | OK | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641425 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 641904 | 10/31/20 15:03 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641424 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 641672 | 10/30/20 14:11 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516057 | 11/07/20 18:10 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515502 | 11/04/20 22:57 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

## Client Sample ID: SHL-DUP09-FAL20

**Lab Sample ID: 680-190620-6**
**Date Collected: 10/26/20 15:15**
**Matrix: Water**
**Date Received: 10/28/20 09:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642137 | 11/03/20 20:37 | OK | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641425 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 641904 | 10/31/20 14:55 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641424 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 641672 | 10/30/20 14:05 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516057 | 11/07/20 18:27 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515502 | 11/04/20 23:14 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-05-39A-FAL20

**Lab Sample ID: 680-190620-7**
**Date Collected: 10/26/20 13:10**
**Matrix: Water**
**Date Received: 10/28/20 09:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642089 | 11/03/20 15:14 | T1C | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641425 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 641904 | 10/31/20 14:48 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641424 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 641672 | 10/30/20 13:59 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516057 | 11/07/20 18:44 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515502 | 11/04/20 23:19 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-05-39B-FAL20

**Lab Sample ID: 680-190620-8**
**Date Collected: 10/26/20 13:00**
**Matrix: Water**
**Date Received: 10/28/20 09:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642353 | 11/05/20 01:16 | OK | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Total/NA | Analysis | 9056A | DL | 10 | 5 mL | 5 mL | 642486 | 11/05/20 13:03 | OK | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641425 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 641904 | 10/31/20 14:51 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

## Client Sample ID: SHM-05-39B-FAL20

**Lab Sample ID: 680-190620-8**

**Date Collected: 10/26/20 13:00**

**Matrix: Water**

**Date Received: 10/28/20 09:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641424 | 10/29/20 13:36 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 641672 | 10/30/20 14:02 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516057 | 11/07/20 19:01 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515502 | 11/04/20 23:23 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

## Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| ANAB | Dept. of Defense ELAP | L2463 | 09-22-22 |

## Laboratory: Eurofins TestAmerica, Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| A2LA | Dept. of Defense ELAP | 2907.01 | 10-31-21 |

# Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190620-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060A | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | TAL SAV |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-190620-01 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 19 | PZ-12-02-FAL20 | WG | | | | X | X | X | X | X | PZ-12-02 | N1 | 24.00 | 34.00 | | |
| 20 | PZ-12-03-FAL20 | WG | | | | X | X | X | X | X | PZ-12-03 | N1 | 24.00 | 34.00 | | |
| 21 | PZ-12-04-FAL20 | WG | | | | X | X | X | X | X | PZ-12-04 | N1 | 24.00 | 34.00 | | |
| 22 | PZ-12-05-FAL20 | WG | | | | X | X | X | X | X | PZ-12-05 | N1 | 26.00 | 36.00 | | |
| 23 | PZ-12-06-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | N1 | 25.00 | 35.00 | | |
| 24 | PZ-12-07-FAL20 | WG | | | | X | X | X | X | X | PZ-12-07 | N1 | 20.00 | 30.00 | | |
| 25 | PZ-12-08-FAL20 | WG | | | | X | X | X | X | X | PZ-12-08 | N1 | 22.00 | 32.00 | | |
| 26 | PZ-12-09-FAL20 | WG | 10-26-20 | 1140 | DC | X | X | X | X | X | PZ-12-09 | MS1 | 20.00 | 30.00 | | |
| 27 | PZ-12-09-FAL20 | WG | 10-26-20 | 1140 | DC | X | X | X | X | X | PZ-12-09 | N1 | 20.00 | 30.00 | | |
| 28 | PZ-12-09-FAL20 | WG | 10-26-20 | 1140 | DC | X | X | X | X | X | PZ-12-09 | SD1 | 20.00 | 30.00 | | |
| 29 | PZ-12-10-FAL20 | WG | 10-26-20 | 940 | DC | X | X | X | X | X | PZ-12-10 | N1 | 20.00 | 30.00 | | With MS/MSD |
| 30 | SHL-10-FAL20 | WG | | | | X | X | X | X | X | SHL-10 | N1 | 24.00 | 39.00 | | |
| 31 | SHL-11-FAL20 | WG | | | | X | X | X | X | X | SHL-11 | N1 | 12.00 | 27.00 | | |
| 32 | SHL-12-FAL20 | WG | | | | X | X | X | X | X | SHL-12 | N1 | 15.00 | 30.00 | | |
| 33 | SHL-15-FAL20 | WG | | | | X | X | X | X | X | SHL-15 | N1 | 14.00 | 24.00 | | |
| 34 | SHL-19-FAL20 | WG | 10-26-20 | 1450 | DC | X | X | X | X | X | SHL-19 | N1 | 20.00 | 30.00 | | |
| 35 | SHL-20-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | N1 | 39.00 | 49.00 | | |
| 36 | SHL-22-FAL20 | WG | | | | X | X | X | X | X | SHL-22 | N1 | 105.00 | 115.00 | | |

**Relinquished by:** [signature]
**Date** 10-26-20
**Time** 1510
Received by: [signature]
SHL_eCOC
Relinquished by: [signature] 10/27/20 1700

**Date**
**Time**
**Shipping Date:**
Received by Laboratory: [signature] 10-28-20 950
Condition: 2.1/2.4 2.0/2.3

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-190620-02 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | | | | | | |
| 87 | SHM-13-03-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-03 | N1 | 42.00 | 52.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-04 | MS1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-04 | N1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-04 | SD1 | 20.00 | 30.00 | | |
| 89 | SHM-13-05-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-05 | N1 | 75.00 | 85.00 | | |
| 90 | SHM-13-06-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-06 | N1 | 36.00 | 46.00 | | |
| 91 | SHM-13-07-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-07 | N1 | 27.00 | 37.00 | | |
| 92 | SHM-13-08-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-08 | N1 | 55.00 | 65.00 | | |
| 93 | SHM-13-14D-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-14D | N1 | 45.00 | 55.00 | | |
| 94 | SHM-13-14S-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-14S | N1 | 5.00 | 15.00 | | |
| 95 | SHM-13-15-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-15 | N1 | 50.00 | 60.00 | | |
| 96 | SHM-93-10D-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-10D | N1 | 48.70 | 58.70 | | |
| 97 | SHM-93-18B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-18B | N1 | 78.50 | 88.50 | | |
| 98 | SHM-93-22B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-22B | N1 | 82.30 | 92.30 | | |
| 99 | SHM-93-22C-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-22C | N1 | 124.30 | 134.30 | | |
| 100 | SHM-93-24A-FAL20 | WG | 10-26-20 | 3350 | NB | X | X | X | X | X | | | | | | SHM-93-24A | N1 | 13.20 | 23.20 | | |
| 101 | SHM-96-5B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-96-5B | N1 | 80.00 | 90.00 | | |
| 102 | SHM-96-5C-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-96-5C | N1 | 50.00 | 60.00 | | |

**Relinquished by:** Drew Clup
**Date** 10-26-20
**Time** 1510
Received by:
SHL_eCOC

**Date**
**Time**
**Shipping Date:**
Received by Laboratory: 10/26/20 1516
Condition:
Relinquished: 10/27/20 1700

TA 10-28-20 950

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-190620-03 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 37 | SHL-23-FAL20 | WG | | | | X | X | X | X | X | SHL-23 | N1 | 23.00 | 33.00 | | |
| 38 | SHL-24-FAL20 | WG | 10/26/20 | 315 | CR | X | X | X | X | X | SHL-24 | N1 | 110.00 | 120.00 | | |
| 39 | SHL-3-FAL20 | WG | | | | X | X | X | X | X | SHL-3 | N1 | 24.00 | 34.00 | | |
| 40 | SHL-4-FAL20 | WG | | | | X | X | X | X | X | SHL-4 | N1 | 3.00 | 13.00 | | |
| 41 | SHL-5-FAL20 | WG | | | | X | X | X | X | X | SHL-5 | N1 | 3.00 | 13.00 | | |
| 42 | SHL-7-FAL20 | WG | | | | X | X | X | X | X | SHL-7 | N1 | 11.00 | 21.00 | | |
| 43 | SHL-8D-FAL20 | WG | | | | X | X | X | X | X | SHL-8D | N1 | 68.00 | 70.00 | | |
| 44 | SHL-8S-FAL20 | WG | | | | X | X | X | X | X | SHL-8S | N1 | 52.00 | 54.00 | | |
| 45 | SHL-9-FAL20 | WG | | | | X | X | X | X | X | SHL-9 | N1 | 15.00 | 25.00 | | |
| 46 | SHL-DUP01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | FD1 | 25.00 | 35.00 | | |
| 47 | SHL-DUP02-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | FD1 | 39.00 | 49.00 | | |
| 48 | SHL-DUP03-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | FD1 | 25.00 | 35.00 | | |
| 49 | SHL-DUP04-FAL20 | WG | | | | X | X | X | X | X | SHP-01-38A | FD1 | 1.50 | 6.50 | | |
| 50 | SHL-DUP05-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | FD1 | 22.00 | 32.00 | | |
| 51 | SHL-DUP06-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | FD1 | 79.50 | 84.50 | | |
| 52 | SHL-DUP07-FAL20 | WG | | | | X | X | X | X | X | SHL-22 | FD1 | 105.00 | 115.00 | | |
| 53 | SHL-DUP08-FAL20 | WG | | | | X | X | X | X | X | SHM-96-5B | FD1 | 80.00 | 90.00 | | |
| 53 | SHL-DUP09-FAL20 | WG | 10/26/20 | 315 | CR | X | X | X | X | X | SHL-24 | FD1 | 110.00 | 120.00 | | |

**Relinquished by:** Diane [signature]
**Date** 10-26-20
**Time** 1516
Received by:
SHL_eCOC

**Date**
**Time**
**Shipping Date:**
Received by Laboratory: [signature] 10/26/20 1516
Condition:
Relinquished by: [signature] 10/27/20 1700

[signature] TA 10-28-20 950

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-190620-04 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | |
| 53 | SHL-DUP10-FAL20 | WG | | | | X | X | X | X | X | SHM-05-40X | FD1 | 32.00 | 34.00 | |
| 54 | SHM-05-39A-FAL20 | WG | 10-26-20 | 1310 | C | X | X | X | X | X | SHM-05-39A | N1 | 37.00 | 39.00 | |
| 55 | SHM-05-39B-FAL20 | WG | 10-26-20 | 1300 | NB | X | X | X | X | X | SHM-05-39B | N1 | 66.00 | 68.00 | |
| 56 | SHM-05-40X-FAL20 | WG | | | | X | X | X | X | X | SHM-05-40X | N1 | 32.00 | 34.00 | |
| 57 | SHM-05-41A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41A | N1 | 42.00 | 44.00 | |
| 58 | SHM-05-41B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41B | N1 | 62.00 | 64.00 | |
| 59 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | MS1 | 88.00 | 93.00 | |
| 60 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | N1 | 88.00 | 93.00 | |
| 61 | SHM-05-41C-FAL20 | WG | | | | X | X | X | X | X | SHM-05-41C | SD1 | 88.00 | 93.00 | |
| 62 | SHM-05-42A-FAL20 | WG | | | | X | X | X | X | X | SHM-05-42A | N1 | 40.00 | 42.00 | |
| 63 | SHM-05-42B-FAL20 | WG | | | | X | X | X | X | X | SHM-05-42B | N1 | 70.00 | 72.00 | |
| 64 | SHM-07-03-FAL20 | WG | | | | X | X | X | X | X | SHM-07-03 | N1 | 25.00 | 35.00 | |
| 65 | SHM-07-05X-FAL20 | WG | | | | X | X | X | X | X | SHM-07-05X | N1 | 55.00 | 65.00 | |
| 66 | SHM-10-02-FAL20 | WG | | | | X | X | X | X | X | SHM-10-02 | N1 | 53.00 | 63.00 | |
| 67 | SHM-10-03-FAL20 | WG | | | | X | X | X | X | X | SHM-10-03 | N1 | 58.50 | 68.50 | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | MS1 | 55.00 | 65.00 | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | N1 | 55.00 | 65.00 | |
| 68 | SHM-10-04-FAL20 | WG | | | | X | X | X | X | X | SHM-10-04 | SD1 | 55.00 | 65.00 | |

**Relinquished by:** Diane Clyne
**Date** 10-26-20
**Time** 1510
Received by:
SHL_eCOC

**Date**
**Time**
**Shipping Date:**
Received by Laboratory: 10/26/20 1516
Condition: Relinquished 10/27/20 1700

TA 10-28-20 950

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-631109.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 2 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-190620-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/9/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| PZ-12-09-FAL20 (680-190620-1) | 10/26/20 | 11:40 Eastern | | Water | | | X | X | 2 | |
| PZ-12-09-FAL20 MS (680-190620-1MS) | 10/26/20 | 11:40 Eastern | MS | Water | | | X | X | 2 | |
| PZ-12-09-FAL20 MSD (680-190620-1MSD) | 10/26/20 | 11:40 Eastern | MSD | Water | | | X | X | 2 | |
| PZ-12-10-FAL20 (680-190620-2) | 10/26/20 | 09:40 Eastern | | Water | | | X | X | 2 | |
| PZ-12-10-FAL20 MS (680-190620-2MS) | 10/26/20 | 09:40 Eastern | MS | Water | | | X | X | 2 | |
| PZ-12-10-FAL20 MSD (680-190620-2MSD) | 10/26/20 | 09:40 Eastern | MSD | Water | | | X | X | 2 | |
| SHL-19-FAL20 (680-190620-3) | 10/26/20 | 14:50 Eastern | | Water | | | X | X | 2 | |
| SHM-93-24A-FAL20 (680-190620-4) | 10/26/20 | 03:30 Eastern | | Water | | | X | X | 2 | |
| SHL-24-FAL20 (680-190620-5) | 10/26/20 | 03:15 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | |
|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |

| | | | | | |
|---|---|---|---|---|---|
| Relinquished by: | Date/Time: 10-24-2020/0758 | Company | Received by: | Date/Time: 10/30/2020 0940 | Company: EFADEN |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| | | |
|---|---|---|
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 0.9 IR11 -0.3 50 10/30/2020 |

Ver: 01/16/2019

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins | Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-631109.2 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 2 of 2 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-190620-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/9/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SHL-DUP09-FAL20 (680-190620-6) | 10/26/20 | 03:15 Eastern | | Water | | | X | X | 2 | |
| SHM-05-39A-FAL20 (680-190620-7) | 10/26/20 | 13:10 Eastern | | Water | | | X | X | 2 | |
| SHM-05-39B-FAL20 (680-190620-8) | 10/26/20 | 13:00 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| [signature] | 10-26-2020/0758 | | [signature] | 10/30/2020 1040 | FTADEN |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 0.9 I R 11 - 0.3 50 10/30/2020 |
|---|---|---|

Ver: 01/16/2019

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-190620-1

**Login Number: 190620**
**List Number: 1**
**Creator: Sims, Robert D**

**List Source: Eurofins TestAmerica, Savannah**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-190620-1

**Login Number: 190620**
**List Number: 2**
**Creator: O'Hara, Jake F**

**List Source: Eurofins TestAmerica, Denver**
**List Creation: 10/31/20 01:21 AM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | N/A | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | False | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

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# ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-190870-1
Client Project/Site: Fort Devens

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

*Authorized for release by:*
*11/12/2020 2:51:18 PM*

Kathryn Smith, Client Service Manager
(912)250-0275
Kathy.Smith@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

# Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

# Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 680-190870-1 | SHM-99-31B-FAL20 | Water | 10/30/20 14:00 | 10/31/20 10:05 | |
| 680-190870-2 | SHM-99-31C-FAL20 | Water | 10/30/20 15:00 | 10/31/20 10:05 | |
| 680-190870-3 | SHM-99-32X-FAL20 | Water | 10/30/20 12:20 | 10/31/20 10:05 | |
| 680-190870-4 | SHM-10-06-FAL20 | Water | 10/30/20 15:40 | 10/31/20 10:05 | |
| 680-190870-5 | SHM-10-13-FAL20 | Water | 10/30/20 14:00 | 10/31/20 10:05 | |
| 680-190870-7 | SHL-DUP05-FAL20 | Water | 10/29/20 16:30 | 10/31/20 10:05 | |
| 680-190870-8 | EPA-PZ-2012-1A-FAL20 | Water | 10/30/20 10:05 | 10/31/20 10:05 | |
| 680-190870-9 | EPA-PZ-2012-1B-FAL20 | Water | 10/30/20 11:10 | 10/31/20 10:05 | |
| 680-190870-10 | EPA-PZ-2012-4A-FAL20 | Water | 10/30/20 13:55 | 10/31/20 10:05 | |
| 680-190870-11 | EPA-PZ-2012-4B-FAL20 | Water | 10/29/20 16:30 | 10/31/20 10:05 | |
| 680-190870-12 | EW-01-FAL20 | Water | 10/30/20 08:10 | 10/31/20 10:05 | |
| 680-190870-13 | EW-04-FAL20 | Water | 10/30/20 08:00 | 10/31/20 10:05 | |
| 680-190870-14 | N5-P1-FAL20 | Water | 10/30/20 15:00 | 10/31/20 10:05 | |

## Job ID: 680-190870-1

**Laboratory: Eurofins TestAmerica, Savannah**

**Narrative**

# CASE NARRATIVE
# Client: Seres Engineering & Services LLC
# Project: Fort Devens

## Report Number: 680-190870-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 10/31/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 4.4º C and 4.6º C.

Sample SHM-10-14-FAL20 was cancelled per client request.

**METALS (ICP) - DISSOLVED**
Samples SHM-99-31B-FAL20 (680-190870-1), SHM-99-31C-FAL20 (680-190870-2), SHM-99-32X-FAL20 (680-190870-3), SHM-10-06-FAL20 (680-190870-4), SHM-10-13-FAL20 (680-190870-5), SHL-DUP05-FAL20 (680-190870-7), EPA-PZ-2012-1A-FAL20 (680-190870-8), EPA-PZ-2012-1B-FAL20 (680-190870-9), EPA-PZ-2012-4A-FAL20 (680-190870-10), EPA-PZ-2012-4B-FAL20 (680-190870-11), EW-01-FAL20 (680-190870-12), EW-04-FAL20 (680-190870-13) and N5-P1-FAL20 (680-190870-14) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/02/2020 and analyzed on 11/03/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples SHM-99-31B-FAL20 (680-190870-1), SHM-99-31C-FAL20 (680-190870-2), SHM-99-32X-FAL20 (680-190870-3), SHM-10-06-FAL20 (680-190870-4), SHM-10-13-FAL20 (680-190870-5), SHL-DUP05-FAL20 (680-190870-7), EPA-PZ-2012-1A-FAL20 (680-190870-8), EPA-PZ-2012-1B-FAL20 (680-190870-9), EPA-PZ-2012-4A-FAL20 (680-190870-10), EPA-PZ-2012-4B-FAL20 (680-190870-11), EW-01-FAL20 (680-190870-12), EW-04-FAL20 (680-190870-13) and N5-P1-FAL20 (680-190870-14) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 11/02/2020 and analyzed on 11/03/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples SHM-99-31B-FAL20 (680-190870-1), SHM-99-31C-FAL20 (680-190870-2), SHM-99-32X-FAL20 (680-190870-3), SHM-10-06-FAL20 (680-190870-4), SHM-10-13-FAL20 (680-190870-5), SHL-DUP05-FAL20 (680-190870-7), EPA-PZ-2012-1A-FAL20 (680-190870-8), EPA-PZ-2012-1B-FAL20 (680-190870-9), EPA-PZ-2012-4A-FAL20 (680-190870-10), EPA-PZ-2012-4B-FAL20 (680-190870-11), EW-01-FAL20 (680-190870-12), EW-04-FAL20 (680-190870-13) and N5-P1-FAL20 (680-190870-14) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 11/05/2020 and 11/06/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**
Samples SHM-99-31B-FAL20 (680-190870-1), SHM-99-31C-FAL20 (680-190870-2), SHM-99-32X-FAL20 (680-190870-3), SHM-10-06-FAL20 (680-190870-4), SHM-10-13-FAL20 (680-190870-5), SHL-DUP05-FAL20 (680-190870-7), EPA-PZ-2012-1A-FAL20 (680-190870-8), EPA-PZ-2012-1B-FAL20 (680-190870-9), EPA-PZ-2012-4A-FAL20 (680-190870-10), EPA-PZ-2012-4B-FAL20 (680-190870-11), EW-01-FAL20 (680-190870-12), EW-04-FAL20 (680-190870-13) and N5-P1-FAL20 (680-190870-14) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 11/06/2020.

## Job ID: 680-190870-1 (Continued)

### Laboratory: Eurofins TestAmerica, Savannah (Continued)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL ORGANIC CARBON (TOC)**

Samples SHM-99-31B-FAL20 (680-190870-1), SHM-99-31C-FAL20 (680-190870-2), SHM-99-32X-FAL20 (680-190870-3), SHM-10-06-FAL20 (680-190870-4), SHM-10-13-FAL20 (680-190870-5), SHL-DUP05-FAL20 (680-190870-7), EPA-PZ-2012-1A-FAL20 (680-190870-8), EPA-PZ-2012-1B-FAL20 (680-190870-9), EPA-PZ-2012-4A-FAL20 (680-190870-10), EPA-PZ-2012-4B-FAL20 (680-190870-11), EW-01-FAL20 (680-190870-12), EW-04-FAL20 (680-190870-13) and N5-P1-FAL20 (680-190870-14) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 11/11/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Client Sample ID: SHM-99-31B-FAL20

**Lab Sample ID: 680-190870-1**
**Date Collected: 10/30/20 14:00**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 8.8 | | 0.50 | 0.20 | mg/L | | | 11/06/20 16:13 | 1 |
| Sulfate | 4.7 | M | 1.0 | 0.40 | mg/L | | | 11/06/20 16:13 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | J | 50 | 17 | ug/L | | 11/02/20 14:16 | 11/03/20 17:10 | 1 |
| Manganese | 1.5 | J | 10 | 1.0 | ug/L | | 11/02/20 14:16 | 11/03/20 17:10 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.9 | J | 3.0 | 1.5 | ug/L | | 11/02/20 14:16 | 11/03/20 14:17 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 35 | | 10 | 3.1 | mg/L | | | 11/05/20 22:39 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.3 | | 1.0 | 0.35 | mg/L | | | 11/11/20 03:17 | 1 |

## Client Sample ID: SHM-99-31C-FAL20

**Lab Sample ID: 680-190870-2**
**Date Collected: 10/30/20 15:00**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 31 | | 0.50 | 0.20 | mg/L | | | 11/06/20 16:25 | 1 |
| Sulfate | 4.7 | M | 1.0 | 0.40 | mg/L | | | 11/06/20 16:25 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 12000 | | 50 | 17 | ug/L | | 11/02/20 14:16 | 11/03/20 17:38 | 1 |
| Manganese | 4600 | | 10 | 1.0 | ug/L | | 11/02/20 14:16 | 11/03/20 17:38 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 140 | | 3.0 | 1.5 | ug/L | | 11/02/20 14:16 | 11/03/20 14:38 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 230 | | 10 | 3.1 | mg/L | | | 11/05/20 22:46 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.9 | | 1.0 | 0.35 | mg/L | | | 11/11/20 04:39 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Client Sample ID: SHM-99-32X-FAL20

**Lab Sample ID: 680-190870-3**
**Date Collected: 10/30/20 12:20**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 72 | | 0.50 | 0.20 | mg/L | | | 11/06/20 16:38 | 1 |
| Sulfate | 11 | M | 1.0 | 0.40 | mg/L | | | 11/06/20 16:38 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 4200 | | 50 | 17 | ug/L | | 11/02/20 14:16 | 11/03/20 17:05 | 1 |
| Manganese | 2800 | | 10 | 1.0 | ug/L | | 11/02/20 14:16 | 11/03/20 17:05 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 26 | | 3.0 | 1.5 | ug/L | | 11/02/20 14:16 | 11/03/20 14:13 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 58 | | 10 | 3.1 | mg/L | | | 11/05/20 22:50 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.2 | | 1.0 | 0.35 | mg/L | | | 11/11/20 04:55 | 1 |

## Client Sample ID: SHM-10-06-FAL20

**Lab Sample ID: 680-190870-4**
**Date Collected: 10/30/20 15:40**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 33 | | 0.50 | 0.20 | mg/L | | | 11/06/20 16:51 | 1 |
| Sulfate | 7.8 | M | 1.0 | 0.40 | mg/L | | | 11/06/20 16:51 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 63000 | | 50 | 17 | ug/L | | 11/02/20 14:16 | 11/03/20 17:47 | 1 |
| Manganese | 1400 | | 10 | 1.0 | ug/L | | 11/02/20 14:16 | 11/03/20 17:47 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1000 | | 3.0 | 1.5 | ug/L | | 11/02/20 14:16 | 11/03/20 14:45 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 140 | | 10 | 3.1 | mg/L | | | 11/05/20 22:56 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.9 | | 1.0 | 0.35 | mg/L | | | 11/11/20 05:12 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Client Sample ID: SHM-10-13-FAL20

**Lab Sample ID: 680-190870-5**
**Date Collected: 10/30/20 14:00**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 31 | | 0.50 | 0.20 | mg/L | | | 11/06/20 17:03 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/06/20 17:03 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 58000 | | 50 | 17 | ug/L | | 11/02/20 14:16 | 11/03/20 17:51 | 1 |
| Manganese | 1200 | | 10 | 1.0 | ug/L | | 11/02/20 14:16 | 11/03/20 17:51 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 430 | | 3.0 | 1.5 | ug/L | | 11/02/20 14:16 | 11/03/20 14:48 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 250 | | 10 | 3.1 | mg/L | | | 11/05/20 23:58 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 4.3 | | 1.0 | 0.35 | mg/L | | | 11/11/20 05:32 | 1 |

## Client Sample ID: SHL-DUP05-FAL20

**Lab Sample ID: 680-190870-7**
**Date Collected: 10/29/20 16:30**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 28 | | 0.50 | 0.20 | mg/L | | | 11/06/20 17:29 | 1 |
| Sulfate | 12 | M | 1.0 | 0.40 | mg/L | | | 11/06/20 17:29 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 57000 | | 50 | 17 | ug/L | | 11/02/20 14:16 | 11/03/20 18:19 | 1 |
| Manganese | 760 | | 10 | 1.0 | ug/L | | 11/02/20 14:16 | 11/03/20 18:19 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1900 | | 3.0 | 1.5 | ug/L | | 11/02/20 14:16 | 11/03/20 14:59 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 160 | | 10 | 3.1 | mg/L | | | 11/06/20 00:11 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.0 | | 1.0 | 0.35 | mg/L | | | 11/11/20 06:07 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Client Sample ID: EPA-PZ-2012-1A-FAL20

**Lab Sample ID: 680-190870-8**
**Date Collected: 10/30/20 10:05**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 3.7 | | 0.50 | 0.20 | mg/L | | | 11/06/20 17:41 | 1 |
| Sulfate | 1.8 | M | 1.0 | 0.40 | mg/L | | | 11/06/20 17:41 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 140 | | 50 | 17 | ug/L | | 11/02/20 14:16 | 11/03/20 16:35 | 1 |
| Manganese | 170 | | 10 | 1.0 | ug/L | | 11/02/20 14:16 | 11/03/20 16:35 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/02/20 14:16 | 11/03/20 13:52 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 39 | | 10 | 3.1 | mg/L | | | 11/06/20 00:15 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.8 | | 1.0 | 0.35 | mg/L | | | 11/11/20 06:25 | 1 |

## Client Sample ID: EPA-PZ-2012-1B-FAL20

**Lab Sample ID: 680-190870-9**
**Date Collected: 10/30/20 11:10**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 48 | | 0.50 | 0.20 | mg/L | | | 11/06/20 19:23 | 1 |
| Sulfate | 1.7 | M | 1.0 | 0.40 | mg/L | | | 11/06/20 19:23 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 5800 | | 50 | 17 | ug/L | | 11/02/20 14:16 | 11/03/20 17:42 | 1 |
| Manganese | 790 | | 10 | 1.0 | ug/L | | 11/02/20 14:16 | 11/03/20 17:42 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.6 | | 3.0 | 1.5 | ug/L | | 11/02/20 14:16 | 11/03/20 14:41 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 74 | | 10 | 3.1 | mg/L | | | 11/06/20 00:20 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 7.5 | | 1.0 | 0.35 | mg/L | | | 11/11/20 06:48 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Client Sample ID: EPA-PZ-2012-4A-FAL20

**Lab Sample ID: 680-190870-10**

**Date Collected: 10/30/20 13:55**
**Date Received: 10/31/20 10:05**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 35 | | 0.50 | 0.20 | mg/L | | | 11/06/20 19:35 | 1 |
| Sulfate | 18 | M | 1.0 | 0.40 | mg/L | | | 11/06/20 19:35 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 11000 | | 50 | 17 | ug/L | | 11/02/20 14:16 | 11/03/20 17:24 | 1 |
| Manganese | 8000 | | 10 | 1.0 | ug/L | | 11/02/20 14:16 | 11/03/20 17:24 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 210 | | 3.0 | 1.5 | ug/L | | 11/02/20 14:16 | 11/03/20 14:27 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 170 | | 10 | 3.1 | mg/L | | | 11/06/20 00:38 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.8 | | 1.0 | 0.35 | mg/L | | | 11/11/20 07:13 | 1 |

## Client Sample ID: EPA-PZ-2012-4B-FAL20

**Lab Sample ID: 680-190870-11**

**Date Collected: 10/29/20 16:30**
**Date Received: 10/31/20 10:05**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 28 | | 0.50 | 0.20 | mg/L | | | 11/06/20 19:48 | 1 |
| Sulfate | 12 | M | 1.0 | 0.40 | mg/L | | | 11/06/20 19:48 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 59000 | | 50 | 17 | ug/L | | 11/02/20 14:16 | 11/03/20 18:05 | 1 |
| Manganese | 780 | | 10 | 1.0 | ug/L | | 11/02/20 14:16 | 11/03/20 18:05 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2000 | | 3.0 | 1.5 | ug/L | | 11/02/20 14:16 | 11/03/20 14:55 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 140 | | 10 | 3.1 | mg/L | | | 11/06/20 00:43 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.6 | | 1.0 | 0.35 | mg/L | | | 11/11/20 08:08 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Client Sample ID: EW-01-FAL20

**Lab Sample ID: 680-190870-12**

**Date Collected: 10/30/20 08:10**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18 | | 0.50 | 0.20 | mg/L | | | 11/06/20 20:01 | 1 |
| Sulfate | 4.8 | M | 1.0 | 0.40 | mg/L | | | 11/06/20 20:01 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 56000 | | 50 | 17 | ug/L | | 11/02/20 14:16 | 11/03/20 18:01 | 1 |
| Manganese | 1800 | | 10 | 1.0 | ug/L | | 11/02/20 14:16 | 11/03/20 18:01 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1400 | | 3.0 | 1.5 | ug/L | | 11/02/20 14:16 | 11/03/20 14:52 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 210 | | 10 | 3.1 | mg/L | | | 11/06/20 00:49 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 4.1 | | 1.0 | 0.35 | mg/L | | | 11/11/20 08:59 | 1 |

## Client Sample ID: EW-04-FAL20

**Lab Sample ID: 680-190870-13**

**Date Collected: 10/30/20 08:00**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.7 | | 0.50 | 0.20 | mg/L | | | 11/06/20 20:13 | 1 |
| Sulfate | 4.5 | M | 1.0 | 0.40 | mg/L | | | 11/06/20 20:13 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 33000 | | 50 | 17 | ug/L | | 11/02/20 14:16 | 11/03/20 17:28 | 1 |
| Manganese | 2100 | | 10 | 1.0 | ug/L | | 11/02/20 14:16 | 11/03/20 17:28 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3000 | | 3.0 | 1.5 | ug/L | | 11/02/20 14:16 | 11/03/20 14:31 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 100 | | 10 | 3.1 | mg/L | | | 11/06/20 00:55 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.9 | | 1.0 | 0.35 | mg/L | | | 11/11/20 09:16 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Client Sample ID: N5-P1-FAL20

**Date Collected: 10/30/20 15:00**
**Date Received: 10/31/20 10:05**

## Lab Sample ID: 680-190870-14

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19 | | 0.50 | 0.20 | mg/L | | | 11/06/20 18:45 | 1 |
| Sulfate | 17 | M | 1.0 | 0.40 | mg/L | | | 11/06/20 18:45 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 510 | | 50 | 17 | ug/L | | 11/02/20 14:16 | 11/03/20 17:33 | 1 |
| Manganese | 980 | | 10 | 1.0 | ug/L | | 11/02/20 14:16 | 11/03/20 17:33 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 520 | | 3.0 | 1.5 | ug/L | | 11/02/20 14:16 | 11/03/20 14:34 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 130 | | 10 | 3.1 | mg/L | | | 11/06/20 01:00 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.2 | | 1.0 | 0.35 | mg/L | | | 11/11/20 09:37 | 1 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-642707/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642707**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/06/20 11:09 | 1 |
| Sulfate | 0.40 | U M | 1.0 | 0.40 | mg/L | | | 11/06/20 11:09 | 1 |

**Lab Sample ID: LCS 680-642707/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642707**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.0 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: LCSD 680-642707/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642707**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.0 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 | 0 | 15 |

**Lab Sample ID: MB 680-642708/33** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642708**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/06/20 18:07 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/06/20 18:07 | 1 |

**Lab Sample ID: LCS 680-642708/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642708**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.99 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 9.99 | | mg/L | | 100 | 87 - 112 |

**Lab Sample ID: LCSD 680-642708/35** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642708**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.99 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-190870-14 MS** — **Client Sample ID: N5-P1-FAL20**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642708**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19 | | 10.0 | 28.8 | | mg/L | | 103 | 87 - 111 |
| Sulfate | 17 | M | 10.0 | 27.7 | | mg/L | | 104 | 87 - 112 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: 680-190870-14 MSD**
**Matrix: Water**
**Analysis Batch: 642708**

**Client Sample ID: N5-P1-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19 | | 10.0 | 29.0 | | mg/L | | 105 | 87 - 111 | 1 | 15 |
| Sulfate | 17 | M | 10.0 | 27.9 | | mg/L | | 106 | 87 - 112 | 1 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-641924/1-A**
**Matrix: Water**
**Analysis Batch: 642217**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 641924**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/02/20 14:16 | 11/03/20 16:26 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/02/20 14:16 | 11/03/20 16:26 | 1 |

**Lab Sample ID: LCS 680-641924/2-A**
**Matrix: Water**
**Analysis Batch: 642217**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 641924**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4780 | | ug/L | | 96 | 87 - 115 |
| Manganese | 400 | 387 | | ug/L | | 97 | 90 - 114 |

**Lab Sample ID: 680-190870-8 MS**
**Matrix: Water**
**Analysis Batch: 642217**

**Client Sample ID: EPA-PZ-2012-1A-FAL20**
**Prep Type: Dissolved**
**Prep Batch: 641924**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 140 | | 5000 | 4820 | | ug/L | | 94 | 87 - 115 |
| Manganese | 170 | | 400 | 539 | | ug/L | | 93 | 90 - 114 |

**Lab Sample ID: 680-190870-8 MSD**
**Matrix: Water**
**Analysis Batch: 642217**

**Client Sample ID: EPA-PZ-2012-1A-FAL20**
**Prep Type: Dissolved**
**Prep Batch: 641924**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 140 | | 5000 | 4780 | | ug/L | | 93 | 87 - 115 | 1 | 20 |
| Manganese | 170 | | 400 | 535 | | ug/L | | 92 | 90 - 114 | 1 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-641923/1-A**
**Matrix: Water**
**Analysis Batch: 642104**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 641923**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/02/20 14:16 | 11/03/20 13:45 | 1 |

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: LCS 680-641923/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 642104** — **Prep Batch: 641923**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | | | 100 | 105 | | ug/L | | 105 | 84 - 116 | | |

**Lab Sample ID: 680-190870-8 MS** — **Client Sample ID: EPA-PZ-2012-1A-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 642104** — **Prep Batch: 641923**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 100 | 104 | | ug/L | | 104 | 84 - 116 | | |

**Lab Sample ID: 680-190870-8 MSD** — **Client Sample ID: EPA-PZ-2012-1A-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 642104** — **Prep Batch: 641923**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 100 | 102 | | ug/L | | 102 | 84 - 116 | 2 | 20 |

## Method: 9060A - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-516271/35** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516271**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/11/20 02:46 | 1 |

**Lab Sample ID: LCS 280-516271/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516271**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | | | 25.0 | 24.4 | | mg/L | | 98 | 88 - 112 | | |

**Lab Sample ID: 680-190870-1 MS** — **Client Sample ID: SHM-99-31B-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516271**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.3 | | 25.0 | 26.7 | | mg/L | | 98 | 88 - 112 | | |

**Lab Sample ID: 680-190870-1 MSD** — **Client Sample ID: SHM-99-31B-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516271**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.3 | | 25.0 | 26.8 | | mg/L | | 98 | 88 - 112 | 0 | 15 |

## Method: 9060A - Organic Carbon, Dissolved (DOC) (Continued)

**Lab Sample ID: 680-190870-11 MS** — **Client Sample ID: EPA-PZ-2012-4B-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516271**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.6 | | 25.0 | 27.1 | | mg/L | | 98 | 88 - 112 | | |

**Lab Sample ID: 680-190870-11 MSD** — **Client Sample ID: EPA-PZ-2012-4B-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516271**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.6 | | 25.0 | 27.1 | | mg/L | | 98 | 88 - 112 | 0 | 15 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-515698/57** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 515698**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/05/20 20:20 | 1 |

**Lab Sample ID: MB 280-515698/84** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 515698**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/05/20 23:26 | 1 |

**Lab Sample ID: LCS 280-515698/56** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 515698**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 194 | | mg/L | | 97 | 89 - 109 | | |

**Lab Sample ID: LCS 280-515698/82** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 515698**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 193 | | mg/L | | 97 | 89 - 109 | | |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## HPLC/IC

### Analysis Batch: 642707

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190870-1 | SHM-99-31B-FAL20 | Total/NA | Water | 9056A | |
| 680-190870-2 | SHM-99-31C-FAL20 | Total/NA | Water | 9056A | |
| 680-190870-3 | SHM-99-32X-FAL20 | Total/NA | Water | 9056A | |
| 680-190870-4 | SHM-10-06-FAL20 | Total/NA | Water | 9056A | |
| 680-190870-5 | SHM-10-13-FAL20 | Total/NA | Water | 9056A | |
| 680-190870-7 | SHL-DUP05-FAL20 | Total/NA | Water | 9056A | |
| 680-190870-8 | EPA-PZ-2012-1A-FAL20 | Total/NA | Water | 9056A | |
| MB 680-642707/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-642707/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-642707/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |

### Analysis Batch: 642708

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190870-9 | EPA-PZ-2012-1B-FAL20 | Total/NA | Water | 9056A | |
| 680-190870-10 | EPA-PZ-2012-4A-FAL20 | Total/NA | Water | 9056A | |
| 680-190870-11 | EPA-PZ-2012-4B-FAL20 | Total/NA | Water | 9056A | |
| 680-190870-12 | EW-01-FAL20 | Total/NA | Water | 9056A | |
| 680-190870-13 | EW-04-FAL20 | Total/NA | Water | 9056A | |
| 680-190870-14 | N5-P1-FAL20 | Total/NA | Water | 9056A | |
| MB 680-642708/33 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-642708/34 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-642708/35 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-190870-14 MS | N5-P1-FAL20 | Total/NA | Water | 9056A | |
| 680-190870-14 MSD | N5-P1-FAL20 | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 641923

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190870-1 | SHM-99-31B-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-2 | SHM-99-31C-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-3 | SHM-99-32X-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-4 | SHM-10-06-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-5 | SHM-10-13-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-7 | SHL-DUP05-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-8 | EPA-PZ-2012-1A-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-9 | EPA-PZ-2012-1B-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-10 | EPA-PZ-2012-4A-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-11 | EPA-PZ-2012-4B-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-12 | EW-01-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-13 | EW-04-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-14 | N5-P1-FAL20 | Dissolved | Water | 3005A | |
| MB 680-641923/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-641923/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-190870-8 MS | EPA-PZ-2012-1A-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-8 MSD | EPA-PZ-2012-1A-FAL20 | Dissolved | Water | 3005A | |

### Prep Batch: 641924

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190870-1 | SHM-99-31B-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-2 | SHM-99-31C-FAL20 | Dissolved | Water | 3005A | |

## Metals (Continued)

### Prep Batch: 641924 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190870-3 | SHM-99-32X-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-4 | SHM-10-06-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-5 | SHM-10-13-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-7 | SHL-DUP05-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-8 | EPA-PZ-2012-1A-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-9 | EPA-PZ-2012-1B-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-10 | EPA-PZ-2012-4A-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-11 | EPA-PZ-2012-4B-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-12 | EW-01-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-13 | EW-04-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-14 | N5-P1-FAL20 | Dissolved | Water | 3005A | |
| MB 680-641924/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-641924/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-190870-8 MS | EPA-PZ-2012-1A-FAL20 | Dissolved | Water | 3005A | |
| 680-190870-8 MSD | EPA-PZ-2012-1A-FAL20 | Dissolved | Water | 3005A | |

### Analysis Batch: 642104

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190870-1 | SHM-99-31B-FAL20 | Dissolved | Water | 6020A | 641923 |
| 680-190870-2 | SHM-99-31C-FAL20 | Dissolved | Water | 6020A | 641923 |
| 680-190870-3 | SHM-99-32X-FAL20 | Dissolved | Water | 6020A | 641923 |
| 680-190870-4 | SHM-10-06-FAL20 | Dissolved | Water | 6020A | 641923 |
| 680-190870-5 | SHM-10-13-FAL20 | Dissolved | Water | 6020A | 641923 |
| 680-190870-7 | SHL-DUP05-FAL20 | Dissolved | Water | 6020A | 641923 |
| 680-190870-8 | EPA-PZ-2012-1A-FAL20 | Dissolved | Water | 6020A | 641923 |
| 680-190870-9 | EPA-PZ-2012-1B-FAL20 | Dissolved | Water | 6020A | 641923 |
| 680-190870-10 | EPA-PZ-2012-4A-FAL20 | Dissolved | Water | 6020A | 641923 |
| 680-190870-11 | EPA-PZ-2012-4B-FAL20 | Dissolved | Water | 6020A | 641923 |
| 680-190870-12 | EW-01-FAL20 | Dissolved | Water | 6020A | 641923 |
| 680-190870-13 | EW-04-FAL20 | Dissolved | Water | 6020A | 641923 |
| 680-190870-14 | N5-P1-FAL20 | Dissolved | Water | 6020A | 641923 |
| MB 680-641923/1-A | Method Blank | Total Recoverable | Water | 6020A | 641923 |
| LCS 680-641923/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 641923 |
| 680-190870-8 MS | EPA-PZ-2012-1A-FAL20 | Dissolved | Water | 6020A | 641923 |
| 680-190870-8 MSD | EPA-PZ-2012-1A-FAL20 | Dissolved | Water | 6020A | 641923 |

### Analysis Batch: 642217

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190870-1 | SHM-99-31B-FAL20 | Dissolved | Water | 6010C | 641924 |
| 680-190870-2 | SHM-99-31C-FAL20 | Dissolved | Water | 6010C | 641924 |
| 680-190870-3 | SHM-99-32X-FAL20 | Dissolved | Water | 6010C | 641924 |
| 680-190870-4 | SHM-10-06-FAL20 | Dissolved | Water | 6010C | 641924 |
| 680-190870-5 | SHM-10-13-FAL20 | Dissolved | Water | 6010C | 641924 |
| 680-190870-7 | SHL-DUP05-FAL20 | Dissolved | Water | 6010C | 641924 |
| 680-190870-8 | EPA-PZ-2012-1A-FAL20 | Dissolved | Water | 6010C | 641924 |
| 680-190870-9 | EPA-PZ-2012-1B-FAL20 | Dissolved | Water | 6010C | 641924 |
| 680-190870-10 | EPA-PZ-2012-4A-FAL20 | Dissolved | Water | 6010C | 641924 |
| 680-190870-11 | EPA-PZ-2012-4B-FAL20 | Dissolved | Water | 6010C | 641924 |
| 680-190870-12 | EW-01-FAL20 | Dissolved | Water | 6010C | 641924 |
| 680-190870-13 | EW-04-FAL20 | Dissolved | Water | 6010C | 641924 |
| 680-190870-14 | N5-P1-FAL20 | Dissolved | Water | 6010C | 641924 |

## Metals (Continued)

### Analysis Batch: 642217 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| MB 680-641924/1-A | Method Blank | Total Recoverable | Water | 6010C | 641924 |
| LCS 680-641924/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 641924 |
| 680-190870-8 MS | EPA-PZ-2012-1A-FAL20 | Dissolved | Water | 6010C | 641924 |
| 680-190870-8 MSD | EPA-PZ-2012-1A-FAL20 | Dissolved | Water | 6010C | 641924 |

## General Chemistry

### Analysis Batch: 515698

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190870-1 | SHM-99-31B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190870-2 | SHM-99-31C-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190870-3 | SHM-99-32X-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190870-4 | SHM-10-06-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190870-5 | SHM-10-13-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190870-7 | SHL-DUP05-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190870-8 | EPA-PZ-2012-1A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190870-9 | EPA-PZ-2012-1B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190870-10 | EPA-PZ-2012-4A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190870-11 | EPA-PZ-2012-4B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190870-12 | EW-01-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190870-13 | EW-04-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190870-14 | N5-P1-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-515698/57 | Method Blank | Total/NA | Water | SM 2320B | |
| MB 280-515698/84 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-515698/56 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| LCS 280-515698/82 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Analysis Batch: 516271

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190870-1 | SHM-99-31B-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-2 | SHM-99-31C-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-3 | SHM-99-32X-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-4 | SHM-10-06-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-5 | SHM-10-13-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-7 | SHL-DUP05-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-8 | EPA-PZ-2012-1A-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-9 | EPA-PZ-2012-1B-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-10 | EPA-PZ-2012-4A-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-11 | EPA-PZ-2012-4B-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-12 | EW-01-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-13 | EW-04-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-14 | N5-P1-FAL20 | Dissolved | Water | 9060A | |
| MB 280-516271/35 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-516271/34 | Lab Control Sample | Dissolved | Water | 9060A | |
| 680-190870-1 MS | SHM-99-31B-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-1 MSD | SHM-99-31B-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-11 MS | EPA-PZ-2012-4B-FAL20 | Dissolved | Water | 9060A | |
| 680-190870-11 MSD | EPA-PZ-2012-4B-FAL20 | Dissolved | Water | 9060A | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Client Sample ID: SHM-99-31B-FAL20

**Lab Sample ID: 680-190870-1**
**Matrix: Water**

**Date Collected: 10/30/20 14:00**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642707 | 11/06/20 16:13 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641924 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642217 | 11/03/20 17:10 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641923 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642104 | 11/03/20 14:17 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516271 | 11/11/20 03:17 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/05/20 22:39 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-99-31C-FAL20

**Lab Sample ID: 680-190870-2**
**Matrix: Water**

**Date Collected: 10/30/20 15:00**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642707 | 11/06/20 16:25 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641924 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642217 | 11/03/20 17:38 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641923 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642104 | 11/03/20 14:38 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516271 | 11/11/20 04:39 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/05/20 22:46 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-99-32X-FAL20

**Lab Sample ID: 680-190870-3**
**Matrix: Water**

**Date Collected: 10/30/20 12:20**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642707 | 11/06/20 16:38 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641924 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642217 | 11/03/20 17:05 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641923 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642104 | 11/03/20 14:13 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Client Sample ID: SHM-99-32X-FAL20

**Lab Sample ID: 680-190870-3**
**Date Collected: 10/30/20 12:20**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516271 | 11/11/20 04:55 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/05/20 22:50 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-10-06-FAL20

**Lab Sample ID: 680-190870-4**
**Date Collected: 10/30/20 15:40**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642707 | 11/06/20 16:51 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641924 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642217 | 11/03/20 17:47 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641923 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642104 | 11/03/20 14:45 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516271 | 11/11/20 05:12 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/05/20 22:56 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-10-13-FAL20

**Lab Sample ID: 680-190870-5**
**Date Collected: 10/30/20 14:00**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642707 | 11/06/20 17:03 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641924 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642217 | 11/03/20 17:51 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641923 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642104 | 11/03/20 14:48 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516271 | 11/11/20 05:32 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/05/20 23:58 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Client Sample ID: SHL-DUP05-FAL20

**Lab Sample ID: 680-190870-7**
**Date Collected: 10/29/20 16:30**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642707 | 11/06/20 17:29 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641924 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642217 | 11/03/20 18:19 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641923 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642104 | 11/03/20 14:59 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516271 | 11/11/20 06:07 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/06/20 00:11 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: EPA-PZ-2012-1A-FAL20

**Lab Sample ID: 680-190870-8**
**Date Collected: 10/30/20 10:05**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642707 | 11/06/20 17:41 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641924 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642217 | 11/03/20 16:35 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641923 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642104 | 11/03/20 13:52 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516271 | 11/11/20 06:25 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/06/20 00:15 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: EPA-PZ-2012-1B-FAL20

**Lab Sample ID: 680-190870-9**
**Date Collected: 10/30/20 11:10**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642708 | 11/06/20 19:23 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641924 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642217 | 11/03/20 17:42 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641923 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642104 | 11/03/20 14:41 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Client Sample ID: EPA-PZ-2012-1B-FAL20

**Lab Sample ID: 680-190870-9**
**Date Collected: 10/30/20 11:10**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516271 | 11/11/20 06:48 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/06/20 00:20 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: EPA-PZ-2012-4A-FAL20

**Lab Sample ID: 680-190870-10**
**Date Collected: 10/30/20 13:55**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642708 | 11/06/20 19:35 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641924 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642217 | 11/03/20 17:24 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641923 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642104 | 11/03/20 14:27 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516271 | 11/11/20 07:13 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/06/20 00:38 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: EPA-PZ-2012-4B-FAL20

**Lab Sample ID: 680-190870-11**
**Date Collected: 10/29/20 16:30**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642708 | 11/06/20 19:48 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641924 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642217 | 11/03/20 18:05 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641923 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642104 | 11/03/20 14:55 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516271 | 11/11/20 08:08 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/06/20 00:43 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Client Sample ID: EW-01-FAL20

**Lab Sample ID: 680-190870-12**

**Date Collected: 10/30/20 08:10**
**Date Received: 10/31/20 10:05**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642708 | 11/06/20 20:01 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641924 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642217 | 11/03/20 18:01 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641923 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642104 | 11/03/20 14:52 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516271 | 11/11/20 08:59 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/06/20 00:49 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: EW-04-FAL20

**Lab Sample ID: 680-190870-13**

**Date Collected: 10/30/20 08:00**
**Date Received: 10/31/20 10:05**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642708 | 11/06/20 20:13 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641924 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642217 | 11/03/20 17:28 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641923 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642104 | 11/03/20 14:31 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516271 | 11/11/20 09:16 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/06/20 00:55 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: N5-P1-FAL20

**Lab Sample ID: 680-190870-14**

**Date Collected: 10/30/20 15:00**
**Date Received: 10/31/20 10:05**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642708 | 11/06/20 18:45 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 641924 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642217 | 11/03/20 17:33 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 641923 | 11/02/20 14:16 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642104 | 11/03/20 14:34 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Client Sample ID: N5-P1-FAL20

**Date Collected: 10/30/20 15:00**
**Date Received: 10/31/20 10:05**

## Lab Sample ID: 680-190870-14

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516271 | 11/11/20 09:37 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/06/20 01:00 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

## Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| ANAB | Dept. of Defense ELAP | L2463 | 09-22-22 |

## Laboratory: Eurofins TestAmerica, Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| A2LA | Dept. of Defense ELAP | 2907.01 | 10-31-21 |

# Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190870-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060A | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | TAL SAV |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

Boston #215

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-190870-01 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 103 | SHM-99-31A-FAL20 | WG | | | | X | X | X | X | X | SHM-99-31A | N1 | 4.00 | 14.00 | | |
| 104 | SHM-99-31B-FAL20 | WG | 10-30-20 | 200 | CR | X | X | X | X | X | SHM-99-31B | N1 | 50.00 | 60.00 | | (14:00) |
| 105 | SHM-99-31C-FAL20 | WG | 10-30-20 | 3:00 | CR | X | X | X | X | X | SHM-99-31C | N1 | 68.00 | 78.00 | | (15:00) |
| 106 | SHM-99-32X-FAL20 | WG | 10-30-20 | 1220 | BR | X | X | X | X | X | SHM-99-32X | N1 | 72.00 | 82.00 | | |
| 107 | SHP-01-36X-FAL20 | WG | | | | X | X | X | X | X | SHP-01-36X | N1 | 3.00 | 8.00 | | |
| 108 | SHP-01-37X-FAL20 | WG | | | | X | X | X | X | X | SHP-01-37X | N1 | 1.00 | 6.00 | | |
| 109 | SHP-01-38A-FAL20 | WG | | | | X | X | X | X | X | SHP-01-38A | N1 | 1.50 | 6.50 | | |
| 110 | SHP-2016-06A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-06A | N1 | 81.00 | 86.00 | | |
| 111 | SHP-2016-06B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-06B | N1 | 102.00 | 112.00 | | |
| 112 | SHP-2016-06C-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-06C | N1 | 123.00 | 133.00 | | |
| 113 | SHP-2016-07A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | N1 | 22.00 | 32.00 | | |
| 114 | SHP-2016-07B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07B | N1 | 70.00 | 80.00 | | |
| 115 | SHP-2016-1A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-1A | N1 | 13.00 | 23.00 | | |
| 116 | SHP-2016-1B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-1B | N1 | 75.00 | 85.00 | | |
| 117 | SHP-2016-2A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-2A | N1 | 20.00 | 25.00 | | |
| 118 | SHP-2016-2B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-2B | N1 | 80.00 | 85.00 | | |
| 119 | SHP-2016-3A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-3A | N1 | 20.00 | 25.00 | | |
| 120 | SHP-2016-3B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-3B | N1 | 80.00 | 85.00 | | |

**Relinquished by:**
**Date**
**Time**
Received by:
SHL_eCOC

10-30-20 1710
10/30/20 17:10

**Date**
**Time**
**Shipping Date:**
Received by Laboratory:
Condition:

10/30/20 17:30
TN 10-31-20 1005
4.1/4.4 4.3/4.6



11/12/2020

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

Boston #215

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-190870-02 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 69 | SHM-10-05A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-05A | N1 | 50.00 | 60.00 | | |
| 70 | SHM-10-06-FAL20 | WG | 10-30-20 | 1540 | DC | X | X | X | X | X | SHM-10-06 | N1 | 69.50 | 79.50 | | |
| 71 | SHM-10-06A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06A | N1 | 77.00 | 87.00 | | |
| 72 | SHM-10-07-FAL20 | WG | | | | X | X | X | X | X | SHM-10-07 | N1 | 40.00 | 50.00 | | |
| 73 | SHM-10-08-FAL20 | WG | | | | X | X | X | X | X | SHM-10-08 | N1 | 46.00 | 56.00 | | |
| 74 | SHM-10-10-FAL20 | WG | | | | X | X | X | X | X | SHM-10-10 | N1 | 56.00 | 66.00 | | |
| 75 | SHM-10-11-FAL20 | WG | | | | X | X | X | X | X | SHM-10-11 | N1 | 50.00 | 60.00 | | |
| 76 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | MS1 | 45.00 | 55.00 | | |
| 77 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | N1 | 45.00 | 55.00 | | |
| 78 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | SD1 | 45.00 | 55.00 | | |
| 79 | SHM-10-13-FAL20 | WG | 10-30-20 | 1400 | NB | X | X | X | X | X | SHM-10-13 | N1 | 60.00 | 70.00 | | |
| 80 | SHM-10-14-FAL20 | WG | 10-30-20 | 1110 | NB | X | X | X | X | X | SHM-10-14 | N1 | 60.00 | 80.00 | | |
| 81 | SHM-10-15-FAL20 | WG | | | | X | X | X | X | X | SHM-10-15 | N1 | 45.00 | 55.00 | | |
| 82 | SHM-10-16-FAL20 | WG | | | | X | X | X | X | X | SHM-10-16 | N1 | 75.00 | 85.00 | | |
| 83 | SHM-11-02-FAL20 | WG | | | | X | X | X | X | X | SHM-11-02 | N1 | 52.00 | 66.00 | | |
| 84 | SHM-11-06-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | N1 | 25.00 | 35.00 | | |
| 85 | SHM-13-01-FAL20 | WG | | | | X | X | X | X | X | SHM-13-01 | N1 | 39.00 | 49.00 | | |
| 86 | SHM-13-02-FAL20 | WG | | | | X | X | X | X | X | SHM-13-02 | N1 | 60.00 | 70.00 | | |

**Relinquished by:** Diane Clegg
**Date** 10-30-20
**Time** 1710
**Received by:** [signature] 10/30/20 17:10
SHL_eCOC

**Date** [signature] 10/30/20
**Time** 17:30
**Shipping Date:** 10-31-20 1005
Received by Laboratory: [signature] TA
Condition:



11/12/2020

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

Boston #215

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-190870-03 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | | | | | | |
| 37 | SHL-23-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-23 | N1 | 23.00 | 33.00 | | |
| 38 | SHL-24-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-24 | N1 | 110.00 | 120.00 | | |
| 39 | SHL-3-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-3 | N1 | 24.00 | 34.00 | | |
| 40 | SHL-4-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-4 | N1 | 3.00 | 13.00 | | |
| 41 | SHL-5-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-5 | N1 | 3.00 | 13.00 | | |
| 42 | SHL-7-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-7 | N1 | 11.00 | 21.00 | | |
| 43 | SHL-8D-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-8D | N1 | 68.00 | 70.00 | | |
| 44 | SHL-8S-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-8S | N1 | 52.00 | 54.00 | | |
| 45 | SHL-9-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-9 | N1 | 15.00 | 25.00 | | |
| 46 | SHL-DUP01-FAL20 | WG | | | | X | X | X | X | X | | | | | | PZ-12-06 | FD1 | 25.00 | 35.00 | | |
| 47 | SHL-DUP02-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-20 | FD1 | 39.00 | 49.00 | | |
| 48 | SHL-DUP03-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-11-06 | FD1 | 25.00 | 35.00 | | |
| 49 | SHL-DUP04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-01-38A | FD1 | 1.50 | 6.50 | | |
| 50 | SHL-DUP05-FAL20 | WG | 10-29-20 | 1630 | DC | X | X | X | X | X | | | | | | SHP-2016-07A | FD1 | 22.00 | 32.00 | | |
| 51 | SHL-DUP06-FAL20 | WG | | | | X | X | X | X | X | | | | | | EPA-PZ-2012-4B | FD1 | 79.50 | 84.50 | | |
| 52 | SHL-DUP07-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-22 | FD1 | 105.00 | 115.00 | | |
| 53 | SHL-DUP08-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-96-5B | FD1 | 80.00 | 90.00 | | |
| 53 | SHL-DUP09-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-24 | FD1 | 110.00 | 120.00 | | |

**Relinquished by:** [signature]
**Date** 10/30/20
**Time** 1710
Received by: [signature] 10/30/20 17:10
SHL_eCOC

**Date**
**Time**
**Shipping Date:**
Received by Laboratory: [signature] 10/30/20 17:30
Condition:

[signature] TA
10-31-20 1005

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

Boston #215

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-190870-04 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 1 | EPA-PZ-2012-1A-FAL20 | WG | 10-30-20 | 1005 | DC | X | X | X | X | X | EPA-PZ-2012-1A | N1 | 23.70 | 28.70 | | |
| 2 | EPA-PZ-2012-1B-FAL20 | WG | 10-30-20 | 1110 | DC | X | X | X | X | X | EPA-PZ-2012-1B | N1 | 73.56 | 78.56 | | |
| 3 | EPA-PZ-2012-2A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-2A | N1 | 18.14 | 23.14 | | |
| 4 | EPA-PZ-2012-2B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-2B | N1 | 73.16 | 78.16 | | |
| 5 | EPA-PZ-2012-3A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-3A | N1 | 19.09 | 24.09 | | |
| 6 | EPA-PZ-2012-3B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-3B | N1 | 68.70 | 73.70 | | |
| 7 | EPA-PZ-2012-4A-FAL20 | WG | 10-30-20 | 1355 | DC | X | X | X | X | X | EPA-PZ-2012-4A | N1 | 19.56 | 24.56 | | |
| 8 | EPA-PZ-2012-4B-FAL20 | WG | 10-29-20 | 1630 | DC | X | X | X | X | X | EPA-PZ-2012-4B | N1 | 79.50 | 84.50 | | |
| 9 | EPA-PZ-2012-5A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-5A | N1 | 17.95 | 22.95 | | |
| 10 | EPA-PZ-2012-5B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-5B | N1 | 68.46 | 73.46 | | |
| 11 | EPA-PZ-2012-6A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-6A | N1 | 24.19 | 29.19 | | |
| 12 | EPA-PZ-2012-6B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-6B | N1 | 74.23 | 79.23 | | |
| 13 | EPA-PZ-2012-7A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-7A | N1 | 23.87 | 28.87 | | |
| 14 | EPA-PZ-2012-7B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-7B | N1 | 58.82 | 63.82 | | |
| 15 | EW-01-FAL20 | WG | 10-30-20 | 810 | DC | X | X | X | X | X | EW-01 | N1 | 60.00 | 85.00 | | |
| 16 | EW-04-FAL20 | WG | 10-30-20 | 800 | DC | X | X | X | X | X | EW-04 | N1 | 70.00 | 95.00 | | |
| 17 | N5-P1-FAL20 | WG | 10-30-20 | 1500 | NB | X | X | X | X | X | N5-P1 | N1 | 95.50 | 97.50 | | |
| 18 | PZ-12-01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-01 | N1 | 24.00 | 34.00 | | |

**Relinquished by:** Drave Clips
**Date**
**Time**
Received by: 10-30-20 1710
SHL_eCOC
10/30/20 17:10

**Date**
**Time**
**Shipping Date:** 10/30/20 17:30
Received by Laboratory: OM TA
Condition: 10-31-20 1005



11/12/2020

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

Boston #215

| | |
|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA |
| **Project Number: DEVNS-LTM** | POC: |
| **WBS Code:** | Ship to: |

Event: Seres- ... Term Monitoring, S ... 0

680-190870-05 Chain of Custody

**Comments:**
SW8081B (A) = Pesticides
SW9012B (A) = Cyanide

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 1 | 2x 1L amber glass bottles, Cool to <6degC |
| 6 | 1x 125mL, plastic, Cool < 6degC |
| 21 | 1x 2-1 Liter, amber, glass, Cool < 6degC |
| 29 | 3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC |
| 48 | 1x 250mL plastic, NaOH to pH >12; Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, Sudbury Annex, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | E410.4 - COD | SW8081B (A) | SW8082A - PCB | SW8260B - VOCs | SW9012B (A) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 6 | 21 | 1 | 29 | 48 | | | | | | |
| 1 | OHM-A7-08-FAL20 | WG | | | | X | X | X | X | X | OHM-A7-08 | N1 | 20.60 | 35.60 | | |
| 2 | SUD-A07-014-FAL20 | WG | 10-28-20 | 1500 | CR | X | X | X | X | X | SUD-A07-014 | N1 | 12.00 | 22.00 | | |
| 3 | SUD-A07-065-FAL20 | WG | | | | X | X | X | X | X | SUD-A07-065 | N1 | 4.50 | 9.50 | | |
| 4 | SUD-DUP01-FAL20 | WG | | | | X | X | X | X | X | SUDA7-19-01 | FD1 | 2.00 | 10.00 | | |
| 5 | SUDA7-19-01-FAL20 | WG | | | | X | X | X | X | X | SUDA7-19-01 | N1 | 2.00 | 10.00 | | |

**Turnaround Time: NA**

Trip Blank 8260B VOC's

PCB/Pest Not Included

**Relinquished by:** Diane Clapp
**Date** 10-30-20
**Time**
Received by: [signature] 10/30/20 17:10
SUD_eCOC

**Date**
**Time**
**Shipping Date:** 10/30/20 17:30
Received by Laboratory: [signature] TA 10-31-20 1005
Condition:

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-631604.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 2 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-190870-1 |
| Address: 4955 Yarrow Street, | Due Date Requested: 11/11/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SHM-99-31B-FAL20 (680-190870-1) | 10/30/20 | 14:00 Eastern | | Water | | | X | X | 2 | |
| SHM-99-31C-FAL20 (680-190870-2) | 10/30/20 | 15:00 Eastern | | Water | | | X | X | 2 | |
| SHM-99-32X-FAL20 (680-190870-3) | 10/30/20 | 12:20 Eastern | | Water | | | X | X | 2 | |
| SHM-10-06-FAL20 (680-190870-4) | 10/30/20 | 15:40 Eastern | | Water | | | X | X | 2 | |
| SHM-10-13-FAL20 (680-190870-5) | 10/30/20 | 14:00 Eastern | | Water | | | X | X | 2 | |
| SHM-10-14-FAL20 (680-190870-6) | 10/30/20 | 11:10 Eastern | | Water | | | X | X | 2 | |
| SHL-DUP05-FAL20 (680-190870-7) | 10/29/20 | 16:30 Eastern | | Water | | | X | X | 2 | |
| EPA-PZ-2012-1A-FAL20 (680-190870-8) | 10/30/20 | 10:05 Eastern | | Water | | | X | X | 2 | |
| EPA-PZ-2012-1B-FAL20 (680-190870-9) | 10/30/20 | 11:10 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| [signature] | 11-02-20 | 1611 | Laurence Chaney | 11-3-20 9:15 | EUROFINS/TA |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|
| Δ Yes Δ No | | 1.0, 0.8 IR# 11-0.3 RP 11/3 |

Ver: 01/16/2019

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins | Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-631604.2 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 2 of 2 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-190870-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/11/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=Comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| EPA-PZ-2012-4A-FAL20 (680-190870-10) | 10/30/20 | 13:55 Eastern | | Water | | | X | X | 2 | |
| EPA-PZ-2012-4B-FAL20 (680-190870-11) | 10/29/20 | 16:30 Eastern | | Water | | | X | X | 2 | |
| EW-01-FAL20 (680-190870-12) | 10/30/20 | 08:10 Eastern | | Water | | | X | X | 2 | |
| EW-04-FAL20 (680-190870-13) | 10/30/20 | 08:00 Eastern | | Water | | | X | X | 2 | |
| N5-P1-FAL20 (680-190870-14) | 10/30/20 | 15:00 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | | | |
|---|---|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
| Relinquished by: [signature] | Date/Time: 11-02-20 | Company: 611 | Received by: Laurence Chang | Date/Time: 11-3-20 9:15 | Company: EURO/TA |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | | Cooler Temperature(s) °C and Other Remarks: | | |

Ver: 01/16/2019

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-631604.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-190870-2 |
| Address: 4955 Yarrow Street, | Due Date Requested: 11/11/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 410.4/ COD | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| SUD-A07-014-FAL20 (680-190870-15) | 10/28/20 | 15:00 Eastern | | Water | | | X | 1 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | | | |
|---|---|---|---|---|---|
| Empty Kit Relinquished by: | Date: | | Time: | Method of Shipment: | |
| Relinquished by: [signature] | Date/Time: 11-02-20 | Company: 1611 | Received by: Lawrence Chaney | Date/Time: 11-3-20 9:15 | Company: EUROITA |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | | Cooler Temperature(s) °C and Other Remarks: | | |

Ver: 01/16/2019

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-190870-1

**Login Number: 190870**
**List Number: 1**
**Creator: Sims, Robert D**

**List Source: Eurofins TestAmerica, Savannah**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-190870-1

**Login Number: 190870**
**List Number: 2**
**Creator: Pottruff, Reed W**

**List Source: Eurofins TestAmerica, Denver**
**List Creation: 11/03/20 09:55 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | N/A | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

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# ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-190885-1
Client Project/Site: Fort Devens

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

*Authorized for release by:*
*11/12/2020 2:47:54 PM*

Kathryn Smith, Client Service Manager
(912)250-0275
Kathy.Smith@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

# Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

# Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 680-190885-1 | SHL-11-FAL20 | Water | 10/29/20 11:45 | 10/31/20 10:05 | |
| 680-190885-2 | SHL-20-FAL20 | Water | 10/29/20 14:50 | 10/31/20 10:05 | |
| 680-190885-3 | SHM-13-03-FAL20 | Water | 10/29/20 12:30 | 10/31/20 10:05 | |
| 680-190885-4 | SHM-13-14D-FAL20 | Water | 10/29/20 13:50 | 10/31/20 10:05 | |
| 680-190885-5 | SHM-13-14S-FAL20 | Water | 10/29/20 13:50 | 10/31/20 10:05 | |
| 680-190885-6 | SHM-13-15-FAL20 | Water | 10/29/20 11:30 | 10/31/20 10:05 | |

## Job ID: 680-190885-1

**Laboratory: Eurofins TestAmerica, Savannah**

**Narrative**

# CASE NARRATIVE
# Client: Seres Engineering & Services LLC
# Project: Fort Devens

## Report Number: 680-190885-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 10/31/2020; the samples arrived in good condition, properly preserved and on ice. The temperature of the cooler at receipt was 5.7º C.

**METALS (ICP) - DISSOLVED**
Samples SHL-11-FAL20 (680-190885-1), SHL-20-FAL20 (680-190885-2), SHM-13-03-FAL20 (680-190885-3), SHM-13-14D-FAL20 (680-190885-4), SHM-13-14S-FAL20 (680-190885-5) and SHM-13-15-FAL20 (680-190885-6) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/03/2020 and 11/04/2020 and analyzed on 11/05/2020.

Iron was detected in method blank MB 680-642129/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Iron and Manganese recovered high for the MS of sample SHL-11-FAL20MS (680-190885-1) in batch 680-642672.

Iron recovered high for the MSD of sample SHL-11-FAL20MSD (680-190885-1) in batch 680-642672.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples SHL-11-FAL20 (680-190885-1), SHL-20-FAL20 (680-190885-2), SHM-13-03-FAL20 (680-190885-3), SHM-13-14D-FAL20 (680-190885-4), SHM-13-14S-FAL20 (680-190885-5) and SHM-13-15-FAL20 (680-190885-6) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 11/03/2020 and 11/04/2020 and analyzed on 11/04/2020 and 11/05/2020.

Arsenic recovered low for the MS of sample SHL-11-FAL20MS (680-190885-1) in batch 680-642632.

Arsenic recovered high for the MSD of sample SHL-11-FAL20MSD (680-190885-1) in batch 680-642632.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples SHL-11-FAL20 (680-190885-1), SHL-20-FAL20 (680-190885-2), SHM-13-03-FAL20 (680-190885-3), SHM-13-14D-FAL20 (680-190885-4), SHM-13-14S-FAL20 (680-190885-5) and SHM-13-15-FAL20 (680-190885-6) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 11/06/2020 and 11/11/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**
Samples SHL-11-FAL20 (680-190885-1), SHL-20-FAL20 (680-190885-2), SHM-13-03-FAL20 (680-190885-3), SHM-13-14D-FAL20 (680-190885-4), SHM-13-14S-FAL20 (680-190885-5) and SHM-13-15-FAL20 (680-190885-6) were analyzed for Anions by Ion

## Job ID: 680-190885-1 (Continued)

### Laboratory: Eurofins TestAmerica, Savannah (Continued)

Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 11/05/2020 and 11/06/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL ORGANIC CARBON (TOC)**

Samples SHL-11-FAL20 (680-190885-1), SHL-20-FAL20 (680-190885-2), SHM-13-03-FAL20 (680-190885-3), SHM-13-14D-FAL20 (680-190885-4), SHM-13-14S-FAL20 (680-190885-5) and SHM-13-15-FAL20 (680-190885-6) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 11/11/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

## Client Sample ID: SHL-11-FAL20

**Lab Sample ID: 680-190885-1**
**Date Collected: 10/29/20 11:45**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 66 | | 0.50 | 0.20 | mg/L | | | 11/05/20 16:13 | 1 |
| Sulfate | 16 | M | 1.0 | 0.40 | mg/L | | | 11/05/20 16:13 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 48000 | J | 50 | 17 | ug/L | | 11/04/20 17:58 | 11/05/20 20:34 | 1 |
| Manganese | 2000 | J | 10 | 1.0 | ug/L | | 11/04/20 17:58 | 11/05/20 20:34 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 900 | J | 3.0 | 1.5 | ug/L | | 11/04/20 17:59 | 11/05/20 16:57 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 120 | | 10 | 3.1 | mg/L | | | 11/06/20 02:25 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.4 | | 1.0 | 0.35 | mg/L | | | 11/11/20 03:15 | 1 |

## Client Sample ID: SHL-20-FAL20

**Lab Sample ID: 680-190885-2**
**Date Collected: 10/29/20 14:50**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 63 | | 0.50 | 0.20 | mg/L | | | 11/05/20 16:26 | 1 |
| Sulfate | 28 | M | 1.0 | 0.40 | mg/L | | | 11/05/20 16:26 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 52000 | | 50 | 17 | ug/L | | 11/03/20 16:11 | 11/05/20 06:10 | 1 |
| Manganese | 2100 | | 10 | 1.0 | ug/L | | 11/03/20 16:11 | 11/05/20 06:10 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 760 | | 3.0 | 1.5 | ug/L | | 11/03/20 16:11 | 11/04/20 18:41 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 110 | | 10 | 3.1 | mg/L | | | 11/06/20 02:30 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.8 | | 1.0 | 0.35 | mg/L | | | 11/11/20 04:37 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

## Client Sample ID: SHM-13-03-FAL20

**Lab Sample ID: 680-190885-3**
**Date Collected: 10/29/20 12:30**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 64 | | 0.50 | 0.20 | mg/L | | | 11/05/20 16:38 | 1 |
| Sulfate | 3.5 | M | 1.0 | 0.40 | mg/L | | | 11/05/20 16:38 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 6200 | | 50 | 17 | ug/L | | 11/03/20 16:11 | 11/05/20 06:01 | 1 |
| Manganese | 7500 | | 10 | 1.0 | ug/L | | 11/03/20 16:11 | 11/05/20 06:01 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 83 | | 3.0 | 1.5 | ug/L | | 11/03/20 16:11 | 11/04/20 18:34 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 140 | | 10 | 3.1 | mg/L | | | 11/06/20 02:36 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.6 | | 1.0 | 0.35 | mg/L | | | 11/11/20 04:55 | 1 |

## Client Sample ID: SHM-13-14D-FAL20

**Lab Sample ID: 680-190885-4**
**Date Collected: 10/29/20 13:50**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 120 | | 0.50 | 0.20 | mg/L | | | 11/05/20 16:51 | 1 |
| Sulfate | 15 | | 1.0 | 0.40 | mg/L | | | 11/05/20 16:51 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 37 | J | 50 | 17 | ug/L | | 11/03/20 16:11 | 11/05/20 06:15 | 1 |
| Manganese | 380 | | 10 | 1.0 | ug/L | | 11/03/20 16:11 | 11/05/20 06:15 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/03/20 16:11 | 11/04/20 18:52 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 53 | | 10 | 3.1 | mg/L | | | 11/06/20 02:41 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.9 | | 1.0 | 0.35 | mg/L | | | 11/11/20 05:12 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

## Client Sample ID: SHM-13-14S-FAL20

**Lab Sample ID: 680-190885-5**
**Date Collected: 10/29/20 13:50**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 120 | | 0.50 | 0.20 | mg/L | | | 11/06/20 20:26 | 1 |
| Sulfate | 7.3 | M | 1.0 | 0.40 | mg/L | | | 11/06/20 20:26 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 110 | | 50 | 17 | ug/L | | 11/03/20 16:11 | 11/05/20 06:20 | 1 |
| Manganese | 27 | | 10 | 1.0 | ug/L | | 11/03/20 16:11 | 11/05/20 06:20 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | J | 3.0 | 1.5 | ug/L | | 11/03/20 16:11 | 11/04/20 18:56 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 87 | | 10 | 3.1 | mg/L | | | 11/06/20 02:46 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.8 | | 1.0 | 0.35 | mg/L | | | 11/11/20 05:28 | 1 |

## Client Sample ID: SHM-13-15-FAL20

**Lab Sample ID: 680-190885-6**
**Date Collected: 10/29/20 11:30**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 42 | | 0.50 | 0.20 | mg/L | | | 11/06/20 20:39 | 1 |
| Sulfate | 5.4 | M | 1.0 | 0.40 | mg/L | | | 11/06/20 20:39 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 1200 | | 50 | 17 | ug/L | | 11/03/20 16:11 | 11/05/20 06:06 | 1 |
| Manganese | 4300 | | 10 | 1.0 | ug/L | | 11/03/20 16:11 | 11/05/20 06:06 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7.1 | | 3.0 | 1.5 | ug/L | | 11/03/20 16:11 | 11/04/20 18:38 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 320 | | 10 | 3.1 | mg/L | | | 11/11/20 02:31 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.5 | | 1.0 | 0.35 | mg/L | | | 11/11/20 05:48 | 1 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-642486/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642486**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/05/20 09:08 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/05/20 09:08 | 1 |

**Lab Sample ID: LCS 680-642486/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642486**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.96 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: LCSD 680-642486/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642486**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.95 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 | 0 | 15 |

**Lab Sample ID: MB 680-642708/33** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642708**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/06/20 18:07 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/06/20 18:07 | 1 |

**Lab Sample ID: LCS 680-642708/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642708**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.99 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 9.99 | | mg/L | | 100 | 87 - 112 |

**Lab Sample ID: LCSD 680-642708/35** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 642708**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.99 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 | 1 | 15 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-642129/1-A**
**Matrix: Water**
**Analysis Batch: 642498**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 642129**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 18.2 | J | 50 | 17 | ug/L | | 11/03/20 16:11 | 11/05/20 05:19 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/03/20 16:11 | 11/05/20 05:19 | 1 |

**Lab Sample ID: LCS 680-642129/2-A**
**Matrix: Water**
**Analysis Batch: 642498**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 642129**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4870 | | ug/L | | 97 | 87 - 115 |
| Manganese | 400 | 396 | | ug/L | | 99 | 90 - 114 |

**Lab Sample ID: MB 680-642377/1-A**
**Matrix: Water**
**Analysis Batch: 642672**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 642377**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/04/20 17:58 | 11/05/20 20:25 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/04/20 17:58 | 11/05/20 20:25 | 1 |

**Lab Sample ID: LCS 680-642377/2-A**
**Matrix: Water**
**Analysis Batch: 642672**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 642377**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4730 | | ug/L | | 95 | 87 - 115 |
| Manganese | 400 | 383 | | ug/L | | 96 | 90 - 114 |

**Lab Sample ID: 680-190885-1 MS**
**Matrix: Water**
**Analysis Batch: 642672**

**Client Sample ID: SHL-11-FAL20**
**Prep Type: Dissolved**
**Prep Batch: 642377**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 48000 | J | 5000 | 55400 | 4 | ug/L | | 144 | 87 - 115 |
| Manganese | 2000 | J | 400 | 2500 | 4 | ug/L | | 120 | 90 - 114 |

**Lab Sample ID: 680-190885-1 MSD**
**Matrix: Water**
**Analysis Batch: 642672**

**Client Sample ID: SHL-11-FAL20**
**Prep Type: Dissolved**
**Prep Batch: 642377**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 48000 | J | 5000 | 54600 | 4 | ug/L | | 128 | 87 - 115 | 2 | 20 |
| Manganese | 2000 | J | 400 | 2460 | 4 | ug/L | | 110 | 90 - 114 | 2 | 20 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-642128/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 642406** — **Prep Batch: 642128**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/03/20 16:11 | 11/04/20 17:27 | 1 |

**Lab Sample ID: LCS 680-642128/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 642406** — **Prep Batch: 642128**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 102 | | ug/L | | 102 | 84 - 116 |

**Lab Sample ID: MB 680-642378/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 642632** — **Prep Batch: 642378**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/04/20 17:59 | 11/05/20 16:51 | 1 |

**Lab Sample ID: LCS 680-642378/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 642632** — **Prep Batch: 642378**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 101 | | ug/L | | 101 | 84 - 116 |

**Lab Sample ID: 680-190885-1 MS** — **Client Sample ID: SHL-11-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 642632** — **Prep Batch: 642378**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 900 | J | 100 | 970 | 4 | ug/L | | 75 | 84 - 116 |

**Lab Sample ID: 680-190885-1 MSD** — **Client Sample ID: SHL-11-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 642632** — **Prep Batch: 642378**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 900 | J | 100 | 1050 | 4 | ug/L | | 154 | 84 - 116 | 8 | 20 |

## Method: 9060A - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-516236/24** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516236**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/11/20 02:41 | 1 |

## Method: 9060A - Organic Carbon, Dissolved (DOC) (Continued)

**Lab Sample ID: LCS 280-516236/23** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516236**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | | | 25.0 | 25.1 | | mg/L | | 100 | 88 - 112 | | |

**Lab Sample ID: 680-190885-1 MS** — **Client Sample ID: SHL-11-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516236**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.4 | | 25.0 | 28.0 | | mg/L | | 102 | 88 - 112 | | |

**Lab Sample ID: 680-190885-1 MSD** — **Client Sample ID: SHL-11-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516236**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.4 | | 25.0 | 27.9 | | mg/L | | 102 | 88 - 112 | 0 | 15 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-515698/110** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 515698**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/06/20 01:52 | 1 |

**Lab Sample ID: LCS 280-515698/109** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 515698**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 196 | | mg/L | | 98 | 89 - 109 | | |

**Lab Sample ID: MB 280-516224/58** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516224**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/11/20 00:13 | 1 |

**Lab Sample ID: LCS 280-516224/57** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516224**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 199 | | mg/L | | 99 | 89 - 109 | | |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

## HPLC/IC

### Analysis Batch: 642486

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190885-1 | SHL-11-FAL20 | Total/NA | Water | 9056A | |
| 680-190885-2 | SHL-20-FAL20 | Total/NA | Water | 9056A | |
| 680-190885-3 | SHM-13-03-FAL20 | Total/NA | Water | 9056A | |
| 680-190885-4 | SHM-13-14D-FAL20 | Total/NA | Water | 9056A | |
| MB 680-642486/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-642486/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-642486/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |

### Analysis Batch: 642708

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190885-5 | SHM-13-14S-FAL20 | Total/NA | Water | 9056A | |
| 680-190885-6 | SHM-13-15-FAL20 | Total/NA | Water | 9056A | |
| MB 680-642708/33 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-642708/34 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-642708/35 | Lab Control Sample Dup | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 642128

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190885-2 | SHL-20-FAL20 | Dissolved | Water | 3005A | |
| 680-190885-3 | SHM-13-03-FAL20 | Dissolved | Water | 3005A | |
| 680-190885-4 | SHM-13-14D-FAL20 | Dissolved | Water | 3005A | |
| 680-190885-5 | SHM-13-14S-FAL20 | Dissolved | Water | 3005A | |
| 680-190885-6 | SHM-13-15-FAL20 | Dissolved | Water | 3005A | |
| MB 680-642128/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-642128/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 642129

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190885-2 | SHL-20-FAL20 | Dissolved | Water | 3005A | |
| 680-190885-3 | SHM-13-03-FAL20 | Dissolved | Water | 3005A | |
| 680-190885-4 | SHM-13-14D-FAL20 | Dissolved | Water | 3005A | |
| 680-190885-5 | SHM-13-14S-FAL20 | Dissolved | Water | 3005A | |
| 680-190885-6 | SHM-13-15-FAL20 | Dissolved | Water | 3005A | |
| MB 680-642129/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-642129/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 642377

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190885-1 | SHL-11-FAL20 | Dissolved | Water | 3005A | |
| MB 680-642377/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-642377/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-190885-1 MS | SHL-11-FAL20 | Dissolved | Water | 3005A | |
| 680-190885-1 MSD | SHL-11-FAL20 | Dissolved | Water | 3005A | |

### Prep Batch: 642378

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190885-1 | SHL-11-FAL20 | Dissolved | Water | 3005A | |
| MB 680-642378/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-642378/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

## Metals (Continued)

### Prep Batch: 642378 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190885-1 MS | SHL-11-FAL20 | Dissolved | Water | 3005A | |
| 680-190885-1 MSD | SHL-11-FAL20 | Dissolved | Water | 3005A | |

### Analysis Batch: 642406

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190885-2 | SHL-20-FAL20 | Dissolved | Water | 6020A | 642128 |
| 680-190885-3 | SHM-13-03-FAL20 | Dissolved | Water | 6020A | 642128 |
| 680-190885-4 | SHM-13-14D-FAL20 | Dissolved | Water | 6020A | 642128 |
| 680-190885-5 | SHM-13-14S-FAL20 | Dissolved | Water | 6020A | 642128 |
| 680-190885-6 | SHM-13-15-FAL20 | Dissolved | Water | 6020A | 642128 |
| MB 680-642128/1-A | Method Blank | Total Recoverable | Water | 6020A | 642128 |
| LCS 680-642128/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 642128 |

### Analysis Batch: 642498

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190885-2 | SHL-20-FAL20 | Dissolved | Water | 6010C | 642129 |
| 680-190885-3 | SHM-13-03-FAL20 | Dissolved | Water | 6010C | 642129 |
| 680-190885-4 | SHM-13-14D-FAL20 | Dissolved | Water | 6010C | 642129 |
| 680-190885-5 | SHM-13-14S-FAL20 | Dissolved | Water | 6010C | 642129 |
| 680-190885-6 | SHM-13-15-FAL20 | Dissolved | Water | 6010C | 642129 |
| MB 680-642129/1-A | Method Blank | Total Recoverable | Water | 6010C | 642129 |
| LCS 680-642129/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 642129 |

### Analysis Batch: 642632

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190885-1 | SHL-11-FAL20 | Dissolved | Water | 6020A | 642378 |
| MB 680-642378/1-A | Method Blank | Total Recoverable | Water | 6020A | 642378 |
| LCS 680-642378/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 642378 |
| 680-190885-1 MS | SHL-11-FAL20 | Dissolved | Water | 6020A | 642378 |
| 680-190885-1 MSD | SHL-11-FAL20 | Dissolved | Water | 6020A | 642378 |

### Analysis Batch: 642672

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190885-1 | SHL-11-FAL20 | Dissolved | Water | 6010C | 642377 |
| MB 680-642377/1-A | Method Blank | Total Recoverable | Water | 6010C | 642377 |
| LCS 680-642377/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 642377 |
| 680-190885-1 MS | SHL-11-FAL20 | Dissolved | Water | 6010C | 642377 |
| 680-190885-1 MSD | SHL-11-FAL20 | Dissolved | Water | 6010C | 642377 |

## General Chemistry

### Analysis Batch: 515698

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190885-1 | SHL-11-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190885-2 | SHL-20-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190885-3 | SHM-13-03-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190885-4 | SHM-13-14D-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190885-5 | SHM-13-14S-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-515698/110 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-515698/109 | Lab Control Sample | Total/NA | Water | SM 2320B | |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

## General Chemistry

### Analysis Batch: 516224

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190885-6 | SHM-13-15-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-516224/58 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-516224/57 | Lab Control Sample | Total/NA | Water | SM 2320B | |

### Analysis Batch: 516236

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190885-1 | SHL-11-FAL20 | Dissolved | Water | 9060A | |
| 680-190885-2 | SHL-20-FAL20 | Dissolved | Water | 9060A | |
| 680-190885-3 | SHM-13-03-FAL20 | Dissolved | Water | 9060A | |
| 680-190885-4 | SHM-13-14D-FAL20 | Dissolved | Water | 9060A | |
| 680-190885-5 | SHM-13-14S-FAL20 | Dissolved | Water | 9060A | |
| 680-190885-6 | SHM-13-15-FAL20 | Dissolved | Water | 9060A | |
| MB 280-516236/24 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-516236/23 | Lab Control Sample | Dissolved | Water | 9060A | |
| 680-190885-1 MS | SHL-11-FAL20 | Dissolved | Water | 9060A | |
| 680-190885-1 MSD | SHL-11-FAL20 | Dissolved | Water | 9060A | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

## Client Sample ID: SHL-11-FAL20

**Date Collected: 10/29/20 11:45**
**Date Received: 10/31/20 10:05**

**Lab Sample ID: 680-190885-1**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642486 | 11/05/20 16:13 | OK | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642377 | 11/04/20 17:58 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642672 | 11/05/20 20:34 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642378 | 11/04/20 17:59 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642632 | 11/05/20 16:57 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516236 | 11/11/20 03:15 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/06/20 02:25 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHL-20-FAL20

**Date Collected: 10/29/20 14:50**
**Date Received: 10/31/20 10:05**

**Lab Sample ID: 680-190885-2**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642486 | 11/05/20 16:26 | OK | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642129 | 11/03/20 16:11 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642498 | 11/05/20 06:10 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642128 | 11/03/20 16:11 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642406 | 11/04/20 18:41 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516236 | 11/11/20 04:37 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/06/20 02:30 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-13-03-FAL20

**Date Collected: 10/29/20 12:30**
**Date Received: 10/31/20 10:05**

**Lab Sample ID: 680-190885-3**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642486 | 11/05/20 16:38 | OK | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642129 | 11/03/20 16:11 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642498 | 11/05/20 06:01 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642128 | 11/03/20 16:11 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642406 | 11/04/20 18:34 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

## Client Sample ID: SHM-13-03-FAL20

**Lab Sample ID: 680-190885-3**

**Date Collected: 10/29/20 12:30**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516236 | 11/11/20 04:55 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/06/20 02:36 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-13-14D-FAL20

**Lab Sample ID: 680-190885-4**

**Date Collected: 10/29/20 13:50**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642486 | 11/05/20 16:51 | OK | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642129 | 11/03/20 16:11 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642498 | 11/05/20 06:15 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642128 | 11/03/20 16:11 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642406 | 11/04/20 18:52 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516236 | 11/11/20 05:12 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/06/20 02:41 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-13-14S-FAL20

**Lab Sample ID: 680-190885-5**

**Date Collected: 10/29/20 13:50**
**Matrix: Water**
**Date Received: 10/31/20 10:05**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642708 | 11/06/20 20:26 | UI | TAL SAV |
| | Instrument ID: | CICK | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642129 | 11/03/20 16:11 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642498 | 11/05/20 06:20 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642128 | 11/03/20 16:11 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642406 | 11/04/20 18:56 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516236 | 11/11/20 05:28 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI2 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 515698 | 11/06/20 02:46 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

## Client Sample ID: SHM-13-15-FAL20

**Date Collected: 10/29/20 11:30**
**Date Received: 10/31/20 10:05**

## Lab Sample ID: 680-190885-6

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 642708 | 11/06/20 20:39 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642129 | 11/03/20 16:11 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642498 | 11/05/20 06:06 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642128 | 11/03/20 16:11 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642406 | 11/04/20 18:38 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516236 | 11/11/20 05:48 | JMB | TAL DEN |
| | Instrument ID: WC_SHI2 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516224 | 11/11/20 02:31 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

## Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| ANAB | Dept. of Defense ELAP | L2463 | 09-22-22 |

## Laboratory: Eurofins TestAmerica, Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| A2LA | Dept. of Defense ELAP | 2907.01 | 10-31-21 |

# Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190885-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060A | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | TAL SAV |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

Boston #215

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-190885-01 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 19 | PZ-12-02-FAL20 | WG | | | | X | X | X | X | X | PZ-12-02 | N1 | 24.00 | 34.00 | | |
| 20 | PZ-12-03-FAL20 | WG | | | | X | X | X | X | X | PZ-12-03 | N1 | 24.00 | 34.00 | | |
| 21 | PZ-12-04-FAL20 | WG | | | | X | X | X | X | X | PZ-12-04 | N1 | 24.00 | 34.00 | | |
| 22 | PZ-12-05-FAL20 | WG | | | | X | X | X | X | X | PZ-12-05 | N1 | 26.00 | 36.00 | | |
| 23 | PZ-12-06-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | N1 | 25.00 | 35.00 | | |
| 24 | PZ-12-07-FAL20 | WG | | | | X | X | X | X | X | PZ-12-07 | N1 | 20.00 | 30.00 | | |
| 25 | PZ-12-08-FAL20 | WG | | | | X | X | X | X | X | PZ-12-08 | N1 | 22.00 | 32.00 | | |
| 26 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | PZ-12-09 | MS1 | 20.00 | 30.00 | | |
| 27 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | PZ-12-09 | N1 | 20.00 | 30.00 | | |
| 28 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | PZ-12-09 | SD1 | 20.00 | 30.00 | | |
| 29 | PZ-12-10-FAL20 | WG | | | | X | X | X | X | X | PZ-12-10 | N1 | 20.00 | 30.00 | | |
| 30 | SHL-10-FAL20 | WG | | | | X | X | X | X | X | SHL-10 | N1 | 24.00 | 39.00 | | |
| 31 | SHL-11-FAL20 | WG | 10-29-20 | 1145 | DC | X | X | X | X | X | SHL-11 | N1 | 12.00 | 27.00 | | |
| 32 | SHL-12-FAL20 | WG | | | | X | X | X | X | X | SHL-12 | N1 | 15.00 | 30.00 | | |
| 33 | SHL-15-FAL20 | WG | | | | X | X | X | X | X | SHL-15 | N1 | 14.00 | 24.00 | | |
| 34 | SHL-19-FAL20 | WG | | | | X | X | X | X | X | SHL-19 | N1 | 20.00 | 30.00 | | |
| 35 | SHL-20-FAL20 | WG | 10-29-20 | 1450 | DC | X | X | X | X | X | SHL-20 | N1 | 39.00 | 49.00 | | |
| 36 | SHL-22-FAL20 | WG | | | | X | X | X | X | X | SHL-22 | N1 | 105.00 | 115.00 | | |

**Relinquished by:**
**Date**
**Time**
**Received by:**
SHL_eCOC

Diane [signature] 10/29/20 1515

[signature] 10/29/20 15:15

**Date**
**Time**
**Shipping Date:**
Received by Laboratory:
Condition:

[signature] 10/29/20 17:00

[signature] TA 10-31-20 1005 5.4/5.7



11/12/2020

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

Boston #215

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-190885-02 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | | | | | | |
| 87 | SHM-13-03-FAL20 | WG | 10-29-20 | 1230 | CR | X | X | X | X | X | | | | | | SHM-13-03 | N1 | 42.00 | 52.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-04 | MS1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-04 | N1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-04 | SD1 | 20.00 | 30.00 | | |
| 89 | SHM-13-05-FAL20 | WG | [redacted] | [redacted] | [redacted] | X | X | X | X | X | | | | | | SHM-13-05 | N1 | 75.00 | 85.00 | | |
| 90 | SHM-13-06-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-06 | N1 | 36.00 | 46.00 | | |
| 91 | SHM-13-07-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-07 | N1 | 27.00 | 37.00 | | |
| 92 | SHM-13-08-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-08 | N1 | 55.00 | 65.00 | | |
| 93 | SHM-13-14D-FAL20 | WG | 10-29-20 | 1350 | CR | X | X | X | X | X | | | | | | SHM-13-14D | N1 | 45.00 | 55.00 | | |
| 94 | SHM-13-14S-FAL20 | WG | 10-29-20 | 150 | NB | X | X | X | X | X | | | | | | SHM-13-14S | N1 | 5.00 | 15.00 | | (13:50) |
| 95 | SHM-13-15-FAL20 | WG | 10-29-20 | 1130 | NB | X | X | X | X | X | | | | | | SHM-13-15 | N1 | 50.00 | 60.00 | | |
| 96 | SHM-93-10D-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-10D | N1 | 48.70 | 58.70 | | |
| 97 | SHM-93-18B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-18B | N1 | 78.50 | 88.50 | | |
| 98 | SHM-93-22B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-22B | N1 | 82.30 | 92.30 | | |
| 99 | SHM-93-22C-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-22C | N1 | 124.30 | 134.30 | | |
| 100 | SHM-93-24A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-24A | N1 | 13.20 | 23.20 | | |
| 101 | SHM-96-5B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-96-5B | N1 | 80.00 | 90.00 | | |
| 102 | SHM-96-5C-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-96-5C | N1 | 50.00 | 60.00 | | |

| | | | | | |
|---|---|---|---|---|---|
| **Relinquished by:** | [signature] | [signature] | **Date** | [signature] | OM TA |
| **Date** | 10-29-20 | 10/29/20 | **Time** | 10/29/20 | 10-31-20 1005 |
| **Time** | 1515 | 15:15 | **Shipping Date:** | 17:00 | 5.4/5.7 |
| Received by: | | | Received by Laboratory: | | |
| SHL_eCOC | | | Condition: | | |

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-631604.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-190885-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/11/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SHL-11-FAL20 (680-190885-1) | 10/29/20 | 11:45 Eastern | | Water | | | X | X | 2 | |
| SHL-20-FAL20 (680-190885-2) | 10/29/20 | 14:50 Eastern | | Water | | | X | X | 2 | |
| SHM-13-03-FAL20 (680-190885-3) | 10/29/20 | 12:30 Eastern | | Water | | | X | X | 2 | |
| SHM-13-14D-FAL20 (680-190885-4) | 10/29/20 | 13:50 Eastern | | Water | | | X | X | 2 | |
| SHM-13-14S-FAL20 (680-190885-5) | 10/29/20 | 13:50 Eastern | | Water | | | X | X | 2 | |
| SHM-13-15-FAL20 (680-190885-6) | 10/29/20 | 11:30 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | | | |
|---|---|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | | Method of Shipment: | |
| Relinquished by: [signature] | Date/Time: 11-02-20 | Company: 1611 | Received by: Lawrence Chang | Date/Time: 11-3-20 9:15 | Company: EURO/TA |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | | Cooler Temperature(s) °C and Other Remarks: 1.0, 0.8 | | |

Ver: 01/16/2019

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-190885-1

**Login Number: 190885**
**List Number: 1**
**Creator: Sims, Robert D**

**List Source: Eurofins TestAmerica, Savannah**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-190885-1

**Login Number: 190885**
**List Number: 2**
**Creator: Pottruff, Reed W**

**List Source: Eurofins TestAmerica, Denver**
**List Creation: 11/03/20 10:00 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | N/A | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

eurofins | Environment Testing America

# ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-190931-1
Client Project/Site: Fort Devens
Revision: 1

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

*Authorized for release by:*
*11/25/2020 12:02:02 PM*

Kathryn Smith, Client Service Manager
(912)250-0275
Kathy.Smith@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

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*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

# Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| M | Manual integrated compound. |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

# Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 680-190931-1 | EPA-PZ-2012-3A-FAL20 | Water | 11/02/20 12:45 | 11/03/20 11:38 | |
| 680-190931-2 | EPA-PZ-2012-3B-FAL20 | Water | 11/02/20 14:30 | 11/03/20 11:38 | |
| 680-190931-3 | PZ-12-01-FAL20 | Water | 11/02/20 11:15 | 11/03/20 11:38 | |
| 680-190931-4 | PZ-12-02-FAL20 | Water | 11/02/20 13:00 | 11/03/20 11:38 | |
| 680-190931-5 | PZ-12-03-FAL20 | Water | 11/02/20 14:10 | 11/03/20 11:38 | |
| 680-190931-6 | SHL-15-FAL20 | Water | 11/02/20 14:10 | 11/03/20 11:38 | |
| 680-190931-7 | SHL-DUP03-FAL20 | Water | 11/02/20 09:35 | 11/03/20 11:38 | |
| 680-190931-8 | SHM-10-15-FAL20 | Water | 11/02/20 13:15 | 11/03/20 11:38 | |
| 680-190931-9 | SHM-11-06-FAL20 | Water | 11/02/20 09:35 | 11/03/20 11:38 | |
| 680-190931-10 | SHM-99-31A-FAL20 | Water | 11/02/20 11:00 | 11/03/20 11:38 | |
| 680-190931-11 | SHP-2016-3A-FAL20 | Water | 11/02/20 14:45 | 11/03/20 11:38 | |
| 680-190931-12 | SHP-99-29X-FAL20 | Water | 11/02/20 10:55 | 11/03/20 11:38 | |

## Job ID: 680-190931-1

**Laboratory: Eurofins TestAmerica, Savannah**

**Narrative**

# CASE NARRATIVE
# Client: Seres Engineering & Services LLC
# Project: Fort Devens

## Report Number: 680-190931-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 11/03/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.1º C and 3.2º C.

**METALS (ICP) - DISSOLVED**
Samples EPA-PZ-2012-3A-FAL20 (680-190931-1), EPA-PZ-2012-3B-FAL20 (680-190931-2), PZ12-01-FAL20 (680-190931-3), PZ-12-02-FAL20 (680-190931-4), PZ-12-03-FAL20 (680-190931-5), SHL-15-FAL20 (680-190931-6), SHL-DUP03-FAL20 (680-190931-7), SHM-10-15-FAL20 (680-190931-8), SHM-11-06-FAL20 (680-190931-9), SHM-99--31A-FAL20 (680-190931-10), SHP-2016-3A-FAL20 (680-190931-11) and SHP-99-29X-FAL20 (680-190931-12) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/05/2020 and 11/07/2020 and analyzed on 11/07/2020 and 11/12/2020.

Iron recovered low for the MS of sample SHM-11-06-FAL20MS (680-190931-9) in batch 680-643776.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples EPA-PZ-2012-3A-FAL20 (680-190931-1), EPA-PZ-2012-3B-FAL20 (680-190931-2), PZ12-01-FAL20 (680-190931-3), PZ-12-02-FAL20 (680-190931-4), PZ-12-03-FAL20 (680-190931-5), SHL-15-FAL20 (680-190931-6), SHL-DUP03-FAL20 (680-190931-7), SHM-10-15-FAL20 (680-190931-8), SHM-11-06-FAL20 (680-190931-9), SHM-99--31A-FAL20 (680-190931-10), SHP-2016-3A-FAL20 (680-190931-11) and SHP-99-29X-FAL20 (680-190931-12) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 11/05/2020 and 11/07/2020 and analyzed on 11/06/2020 and 11/09/2020.

Arsenic recovered high for the MS/MSD of sample SHM-11-06-FAL20 (680-190931-9) in batch 680-643240.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples EPA-PZ-2012-3A-FAL20 (680-190931-1), EPA-PZ-2012-3B-FAL20 (680-190931-2), PZ12-01-FAL20 (680-190931-3), PZ-12-02-FAL20 (680-190931-4), PZ-12-03-FAL20 (680-190931-5), SHL-15-FAL20 (680-190931-6), SHL-DUP03-FAL20 (680-190931-7), SHM-10-15-FAL20 (680-190931-8), SHM-11-06-FAL20 (680-190931-9), SHM-99--31A-FAL20 (680-190931-10), SHP-2016-3A-FAL20 (680-190931-11) and SHP-99-29X-FAL20 (680-190931-12) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 11/11/2020.

Alkalinity was detected in method blank MB 280-516387/31 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**
Samples EPA-PZ-2012-3A-FAL20 (680-190931-1), EPA-PZ-2012-3B-FAL20 (680-190931-2), PZ12-01-FAL20 (680-190931-3),

## Job ID: 680-190931-1 (Continued)

### Laboratory: Eurofins TestAmerica, Savannah (Continued)

PZ-12-02-FAL20 (680-190931-4), PZ-12-03-FAL20 (680-190931-5), SHL-15-FAL20 (680-190931-6), SHL-DUP03-FAL20 (680-190931-7), SHM-10-15-FAL20 (680-190931-8), SHM-11-06-FAL20 (680-190931-9), SHM-99--31A-FAL20 (680-190931-10), SHP-2016-3A-FAL20 (680-190931-11) and SHP-99-29X-FAL20 (680-190931-12) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 11/10/2020, 11/11/2020 and 11/12/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL ORGANIC CARBON (TOC)**

Samples EPA-PZ-2012-3A-FAL20 (680-190931-1), EPA-PZ-2012-3B-FAL20 (680-190931-2), PZ12-01-FAL20 (680-190931-3), PZ-12-02-FAL20 (680-190931-4), PZ-12-03-FAL20 (680-190931-5), SHL-15-FAL20 (680-190931-6), SHL-DUP03-FAL20 (680-190931-7), SHM-10-15-FAL20 (680-190931-8), SHM-11-06-FAL20 (680-190931-9), SHM-99--31A-FAL20 (680-190931-10), SHP-2016-3A-FAL20 (680-190931-11) and SHP-99-29X-FAL20 (680-190931-12) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 11/11/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Client Sample ID: EPA-PZ-2012-3A-FAL20

**Lab Sample ID: 680-190931-1**
**Date Collected: 11/02/20 12:45**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 27 | | 0.50 | 0.20 | mg/L | | | 11/11/20 23:45 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/11/20 23:45 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 13000 | | 50 | 17 | ug/L | | 11/05/20 18:10 | 11/07/20 19:54 | 1 |
| Manganese | 720 | | 10 | 1.0 | ug/L | | 11/05/20 18:10 | 11/07/20 19:54 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 12 | | 3.0 | 1.5 | ug/L | | 11/05/20 18:08 | 11/06/20 21:02 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 97 | | 10 | 3.1 | mg/L | | | 11/11/20 16:49 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 9.8 | | 1.0 | 0.35 | mg/L | | | 11/11/20 18:03 | 1 |

## Client Sample ID: EPA-PZ-2012-3B-FAL20

**Lab Sample ID: 680-190931-2**
**Date Collected: 11/02/20 14:30**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 29 | | 0.50 | 0.20 | mg/L | | | 11/11/20 23:58 | 1 |
| Sulfate | 16 | | 1.0 | 0.40 | mg/L | | | 11/11/20 23:58 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 37000 | | 50 | 17 | ug/L | | 11/05/20 18:10 | 11/07/20 20:07 | 1 |
| Manganese | 5300 | | 10 | 1.0 | ug/L | | 11/05/20 18:10 | 11/07/20 20:07 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2700 | | 3.0 | 1.5 | ug/L | | 11/05/20 18:08 | 11/06/20 21:05 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 170 | | 10 | 3.1 | mg/L | | | 11/11/20 16:55 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.4 | | 1.0 | 0.35 | mg/L | | | 11/11/20 18:50 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Client Sample ID: PZ-12-01-FAL20

**Lab Sample ID: 680-190931-3**
**Date Collected: 11/02/20 11:15**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 57 | | 0.50 | 0.20 | mg/L | | | 11/12/20 00:11 | 1 |
| Sulfate | 19 | | 1.0 | 0.40 | mg/L | | | 11/12/20 00:11 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 52000 | | 50 | 17 | ug/L | | 11/05/20 18:10 | 11/07/20 20:12 | 1 |
| Manganese | 1900 | | 10 | 1.0 | ug/L | | 11/05/20 18:10 | 11/07/20 20:12 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 600 | | 3.0 | 1.5 | ug/L | | 11/05/20 18:08 | 11/06/20 21:08 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 160 | B | 10 | 3.1 | mg/L | | | 11/11/20 17:23 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.9 | | 1.0 | 0.35 | mg/L | | | 11/11/20 19:05 | 1 |

## Client Sample ID: PZ-12-02-FAL20

**Lab Sample ID: 680-190931-4**
**Date Collected: 11/02/20 13:00**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 64 | | 0.50 | 0.20 | mg/L | | | 11/12/20 00:24 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/12/20 00:24 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 64000 | | 50 | 17 | ug/L | | 11/05/20 18:10 | 11/07/20 20:17 | 1 |
| Manganese | 1100 | | 10 | 1.0 | ug/L | | 11/05/20 18:10 | 11/07/20 20:17 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 270 | | 3.0 | 1.5 | ug/L | | 11/05/20 18:08 | 11/06/20 21:11 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | B | 10 | 3.1 | mg/L | | | 11/11/20 17:35 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 3.0 | | 1.0 | 0.35 | mg/L | | | 11/11/20 19:20 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Client Sample ID: PZ-12-03-FAL20

**Lab Sample ID: 680-190931-5**
**Date Collected: 11/02/20 14:10**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 47 | | 0.50 | 0.20 | mg/L | | | 11/12/20 00:36 | 1 |
| Sulfate | 3.0 | M | 1.0 | 0.40 | mg/L | | | 11/12/20 00:36 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 50000 | | 50 | 17 | ug/L | | 11/05/20 18:10 | 11/07/20 20:21 | 1 |
| Manganese | 3300 | | 10 | 1.0 | ug/L | | 11/05/20 18:10 | 11/07/20 20:21 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 720 | | 3.0 | 1.5 | ug/L | | 11/05/20 18:08 | 11/06/20 21:14 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 170 | B | 10 | 3.1 | mg/L | | | 11/11/20 17:40 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.7 | | 1.0 | 0.35 | mg/L | | | 11/11/20 19:37 | 1 |

## Client Sample ID: SHL-15-FAL20

**Lab Sample ID: 680-190931-6**
**Date Collected: 11/02/20 14:10**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19 | | 0.50 | 0.20 | mg/L | | | 11/11/20 23:06 | 1 |
| Sulfate | 9.1 | | 1.0 | 0.40 | mg/L | | | 11/11/20 23:06 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 4500 | | 50 | 17 | ug/L | | 11/05/20 18:10 | 11/07/20 20:26 | 1 |
| Manganese | 250 | | 10 | 1.0 | ug/L | | 11/05/20 18:10 | 11/07/20 20:26 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 26 | | 3.0 | 1.5 | ug/L | | 11/05/20 18:08 | 11/06/20 21:17 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 100 | B | 10 | 3.1 | mg/L | | | 11/11/20 17:46 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.8 | | 1.0 | 0.35 | mg/L | | | 11/11/20 19:51 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Client Sample ID: SHL-DUP03-FAL20

**Lab Sample ID: 680-190931-7**
**Date Collected: 11/02/20 09:35**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 55 | | 0.50 | 0.20 | mg/L | | | 11/12/20 00:49 | 1 |
| Sulfate | 9.3 | M | 1.0 | 0.40 | mg/L | | | 11/12/20 00:49 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 56000 | | 50 | 17 | ug/L | | 11/05/20 18:10 | 11/07/20 20:31 | 1 |
| Manganese | 1400 | | 10 | 1.0 | ug/L | | 11/05/20 18:10 | 11/07/20 20:31 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 680 | | 3.0 | 1.5 | ug/L | | 11/05/20 18:08 | 11/06/20 21:21 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 150 | B | 10 | 3.1 | mg/L | | | 11/11/20 17:52 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.7 | | 1.0 | 0.35 | mg/L | | | 11/11/20 20:13 | 1 |

## Client Sample ID: SHM-10-15-FAL20

**Lab Sample ID: 680-190931-8**
**Date Collected: 11/02/20 13:15**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 8.1 | | 0.50 | 0.20 | mg/L | | | 11/12/20 01:02 | 1 |
| Sulfate | 8.1 | M | 1.0 | 0.40 | mg/L | | | 11/12/20 01:02 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 44000 | | 50 | 17 | ug/L | | 11/05/20 18:10 | 11/07/20 20:35 | 1 |
| Manganese | 7300 | | 10 | 1.0 | ug/L | | 11/05/20 18:10 | 11/07/20 20:35 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 6800 | | 3.0 | 1.5 | ug/L | | 11/05/20 18:08 | 11/06/20 21:24 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 220 | B | 10 | 3.1 | mg/L | | | 11/11/20 17:58 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.2 | | 1.0 | 0.35 | mg/L | | | 11/11/20 21:02 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Client Sample ID: SHM-11-06-FAL20

**Lab Sample ID: 680-190931-9**
**Date Collected: 11/02/20 09:35**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 55 | | 0.50 | 0.20 | mg/L | | | 11/12/20 01:15 | 1 |
| Sulfate | 9.6 | | 1.0 | 0.40 | mg/L | | | 11/12/20 01:15 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 62000 | J | 50 | 17 | ug/L | | 11/07/20 15:41 | 11/12/20 05:04 | 1 |
| Manganese | 1600 | | 10 | 1.0 | ug/L | | 11/07/20 15:41 | 11/12/20 05:04 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 620 | J | 3.0 | 1.5 | ug/L | | 11/07/20 15:43 | 11/09/20 20:14 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 150 | B | 10 | 3.1 | mg/L | | | 11/11/20 18:03 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.8 | | 1.0 | 0.35 | mg/L | | | 11/11/20 21:19 | 1 |

## Client Sample ID: SHM-99-31A-FAL20

**Lab Sample ID: 680-190931-10**
**Date Collected: 11/02/20 11:00**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 20 | | 0.50 | 0.20 | mg/L | | | 11/12/20 01:28 | 1 |
| Sulfate | 7.4 | | 1.0 | 0.40 | mg/L | | | 11/12/20 01:28 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 7600 | | 50 | 17 | ug/L | | 11/07/20 15:41 | 11/12/20 05:28 | 1 |
| Manganese | 270 | | 10 | 1.0 | ug/L | | 11/07/20 15:41 | 11/12/20 05:28 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 20 | | 3.0 | 1.5 | ug/L | | 11/07/20 15:43 | 11/09/20 20:31 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 14 | B | 10 | 3.1 | mg/L | | | 11/11/20 18:08 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 3.9 | | 1.0 | 0.35 | mg/L | | | 11/11/20 21:35 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Client Sample ID: SHP-2016-3A-FAL20

**Lab Sample ID: 680-190931-11**
**Matrix: Water**

**Date Collected: 11/02/20 14:45**
**Date Received: 11/03/20 11:38**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | | 0.50 | 0.20 | mg/L | | | 11/10/20 21:45 | 1 |
| Sulfate | 1.7 | M | 1.0 | 0.40 | mg/L | | | 11/10/20 21:45 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 14000 | | 50 | 17 | ug/L | | 11/07/20 15:41 | 11/12/20 05:33 | 1 |
| Manganese | 670 | | 10 | 1.0 | ug/L | | 11/07/20 15:41 | 11/12/20 05:33 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 5.3 | | 3.0 | 1.5 | ug/L | | 11/07/20 15:43 | 11/09/20 20:35 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 55 | B | 10 | 3.1 | mg/L | | | 11/11/20 18:13 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.3 | | 1.0 | 0.35 | mg/L | | | 11/11/20 21:54 | 1 |

## Client Sample ID: SHP-99-29X-FAL20

**Lab Sample ID: 680-190931-12**
**Matrix: Water**

**Date Collected: 11/02/20 10:55**
**Date Received: 11/03/20 11:38**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.3 | | 0.50 | 0.20 | mg/L | | | 11/10/20 21:57 | 1 |
| Sulfate | 3.2 | M | 1.0 | 0.40 | mg/L | | | 11/10/20 21:57 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 44000 | | 50 | 17 | ug/L | | 11/07/20 15:41 | 11/12/20 05:38 | 1 |
| Manganese | 5500 | | 10 | 1.0 | ug/L | | 11/07/20 15:41 | 11/12/20 05:38 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2300 | | 3.0 | 1.5 | ug/L | | 11/07/20 15:43 | 11/09/20 20:38 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 100 | B | 10 | 3.1 | mg/L | | | 11/11/20 18:30 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.4 | | 1.0 | 0.35 | mg/L | | | 11/11/20 22:41 | 1 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-643310/33** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 643310**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/10/20 19:00 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/10/20 19:00 | 1 |

**Lab Sample ID: LCS 680-643310/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 643310**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.99 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 9.81 | | mg/L | | 98 | 87 - 112 |

**Lab Sample ID: LCSD 680-643310/35** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 643310**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.99 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 9.97 | | mg/L | | 100 | 87 - 112 | 2 | 15 |

**Lab Sample ID: MB 680-643603/33** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 643603**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/11/20 22:27 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/11/20 22:27 | 1 |

**Lab Sample ID: LCS 680-643603/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 643603**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.95 | | mg/L | | 99 | 87 - 111 |
| Sulfate | 10.0 | 10.0 | | mg/L | | 100 | 87 - 112 |

**Lab Sample ID: LCSD 680-643603/35** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 643603**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.94 | | mg/L | | 99 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.1 | | mg/L | | 101 | 87 - 112 | 0 | 15 |

**Lab Sample ID: 680-190931-6 MS** — **Client Sample ID: SHL-15-FAL20**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 643603**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19 | | 10.0 | 28.9 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 9.1 | | 10.0 | 19.2 | | mg/L | | 100 | 87 - 112 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: 680-190931-6 MSD**
**Matrix: Water**
**Analysis Batch: 643603**

**Client Sample ID: SHL-15-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19 | | 10.0 | 29.2 | | mg/L | | 102 | 87 - 111 | 1 | 15 |
| Sulfate | 9.1 | | 10.0 | 19.4 | | mg/L | | 103 | 87 - 112 | 1 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-642621/1-A**
**Matrix: Water**
**Analysis Batch: 642970**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 642621**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/05/20 18:10 | 11/07/20 18:26 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/05/20 18:10 | 11/07/20 18:26 | 1 |

**Lab Sample ID: LCS 680-642621/2-A**
**Matrix: Water**
**Analysis Batch: 642970**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 642621**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4650 | | ug/L | | 93 | 87 - 115 |
| Manganese | 400 | 371 | | ug/L | | 93 | 90 - 114 |

**Lab Sample ID: MB 680-642929/1-A**
**Matrix: Water**
**Analysis Batch: 643776**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 642929**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/07/20 15:41 | 11/12/20 04:44 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/07/20 15:41 | 11/12/20 04:44 | 1 |

**Lab Sample ID: LCS 680-642929/2-A**
**Matrix: Water**
**Analysis Batch: 643776**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 642929**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 5470 | | ug/L | | 109 | 87 - 115 |
| Manganese | 400 | 420 | | ug/L | | 105 | 90 - 114 |

**Lab Sample ID: 680-190931-9 MS**
**Matrix: Water**
**Analysis Batch: 643776**

**Client Sample ID: SHM-11-06-FAL20**
**Prep Type: Dissolved**
**Prep Batch: 642929**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 62000 | J | 5000 | 66000 | 4 | ug/L | | 85 | 87 - 115 |
| Manganese | 1600 | | 400 | 1990 | | ug/L | | 99 | 90 - 114 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 680-190931-9 MSD** — **Client Sample ID: SHM-11-06-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643776** — **Prep Batch: 642929**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 62000 | J | 5000 | 66900 | 4 | ug/L | | 102 | 87 - 115 | 1 | 20 |
| Manganese | 1600 | | 400 | 2020 | | ug/L | | 106 | 90 - 114 | 1 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-642619/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 642840** — **Prep Batch: 642619**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/05/20 18:08 | 11/06/20 20:25 | 1 |

**Lab Sample ID: LCS 680-642619/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 642840** — **Prep Batch: 642619**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 101 | | ug/L | | 101 | 84 - 116 |

**Lab Sample ID: MB 680-642930/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 643240** — **Prep Batch: 642930**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/07/20 15:43 | 11/09/20 20:07 | 1 |

**Lab Sample ID: LCS 680-642930/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 643240** — **Prep Batch: 642930**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 102 | | ug/L | | 102 | 84 - 116 |

**Lab Sample ID: 680-190931-9 MS** — **Client Sample ID: SHM-11-06-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643240** — **Prep Batch: 642930**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 620 | J | 100 | 756 | 4 | ug/L | | 137 | 84 - 116 |

**Lab Sample ID: 680-190931-9 MSD** — **Client Sample ID: SHM-11-06-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643240** — **Prep Batch: 642930**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 620 | J | 100 | 749 | 4 | ug/L | | 130 | 84 - 116 | 1 | 20 |

## Method: 9060A - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-516469/4** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516469**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/11/20 17:34 | 1 |

**Lab Sample ID: LCS 280-516469/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516469**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 24.5 | | mg/L | | 98 | 88 - 112 |

**Lab Sample ID: 680-190931-1 MS** — **Client Sample ID: EPA-PZ-2012-3A-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516469**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 9.8 | | 25.0 | 34.2 | | mg/L | | 97 | 88 - 112 |

**Lab Sample ID: 680-190931-1 MSD** — **Client Sample ID: EPA-PZ-2012-3A-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516469**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 9.8 | | 25.0 | 34.1 | | mg/L | | 97 | 88 - 112 | 0 | 15 |

**Lab Sample ID: 680-190931-11 MS** — **Client Sample ID: SHP-2016-3A-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516469**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.3 | | 25.0 | 25.8 | | mg/L | | 98 | 88 - 112 |

**Lab Sample ID: 680-190931-11 MSD** — **Client Sample ID: SHP-2016-3A-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516469**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.3 | | 25.0 | 25.7 | | mg/L | | 98 | 88 - 112 | 0 | 15 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-516387/31** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516387**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 5.11 | J | 10 | 3.1 | mg/L | | | 11/11/20 17:17 | 1 |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: MB 280-516387/5**
**Matrix: Water**
**Analysis Batch: 516387**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/11/20 13:44 | 1 |

**Lab Sample ID: LCS 280-516387/30**
**Matrix: Water**
**Analysis Batch: 516387**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 192 | | mg/L | | 96 | 89 - 109 | | |

**Lab Sample ID: LCS 280-516387/4**
**Matrix: Water**
**Analysis Batch: 516387**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 195 | | mg/L | | 97 | 89 - 109 | | |

**Lab Sample ID: 680-190931-3 DU**
**Matrix: Water**
**Analysis Batch: 516387**

**Client Sample ID: PZ-12-01-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 160 | B | | 148 | | mg/L | | | | 9 | 10 |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## HPLC/IC

### Analysis Batch: 643310

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190931-11 | SHP-2016-3A-FAL20 | Total/NA | Water | 9056A | |
| 680-190931-12 | SHP-99-29X-FAL20 | Total/NA | Water | 9056A | |
| MB 680-643310/33 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-643310/34 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-643310/35 | Lab Control Sample Dup | Total/NA | Water | 9056A | |

### Analysis Batch: 643603

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190931-1 | EPA-PZ-2012-3A-FAL20 | Total/NA | Water | 9056A | |
| 680-190931-2 | EPA-PZ-2012-3B-FAL20 | Total/NA | Water | 9056A | |
| 680-190931-3 | PZ-12-01-FAL20 | Total/NA | Water | 9056A | |
| 680-190931-4 | PZ-12-02-FAL20 | Total/NA | Water | 9056A | |
| 680-190931-5 | PZ-12-03-FAL20 | Total/NA | Water | 9056A | |
| 680-190931-6 | SHL-15-FAL20 | Total/NA | Water | 9056A | |
| 680-190931-7 | SHL-DUP03-FAL20 | Total/NA | Water | 9056A | |
| 680-190931-8 | SHM-10-15-FAL20 | Total/NA | Water | 9056A | |
| 680-190931-9 | SHM-11-06-FAL20 | Total/NA | Water | 9056A | |
| 680-190931-10 | SHM-99-31A-FAL20 | Total/NA | Water | 9056A | |
| MB 680-643603/33 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-643603/34 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-643603/35 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-190931-6 MS | SHL-15-FAL20 | Total/NA | Water | 9056A | |
| 680-190931-6 MSD | SHL-15-FAL20 | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 642619

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190931-1 | EPA-PZ-2012-3A-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-2 | EPA-PZ-2012-3B-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-3 | PZ-12-01-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-4 | PZ-12-02-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-5 | PZ-12-03-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-6 | SHL-15-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-7 | SHL-DUP03-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-8 | SHM-10-15-FAL20 | Dissolved | Water | 3005A | |
| MB 680-642619/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-642619/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

### Prep Batch: 642621

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190931-1 | EPA-PZ-2012-3A-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-2 | EPA-PZ-2012-3B-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-3 | PZ-12-01-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-4 | PZ-12-02-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-5 | PZ-12-03-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-6 | SHL-15-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-7 | SHL-DUP03-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-8 | SHM-10-15-FAL20 | Dissolved | Water | 3005A | |
| MB 680-642621/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-642621/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Metals

### Analysis Batch: 642840

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190931-1 | EPA-PZ-2012-3A-FAL20 | Dissolved | Water | 6020A | 642619 |
| 680-190931-2 | EPA-PZ-2012-3B-FAL20 | Dissolved | Water | 6020A | 642619 |
| 680-190931-3 | PZ-12-01-FAL20 | Dissolved | Water | 6020A | 642619 |
| 680-190931-4 | PZ-12-02-FAL20 | Dissolved | Water | 6020A | 642619 |
| 680-190931-5 | PZ-12-03-FAL20 | Dissolved | Water | 6020A | 642619 |
| 680-190931-6 | SHL-15-FAL20 | Dissolved | Water | 6020A | 642619 |
| 680-190931-7 | SHL-DUP03-FAL20 | Dissolved | Water | 6020A | 642619 |
| 680-190931-8 | SHM-10-15-FAL20 | Dissolved | Water | 6020A | 642619 |
| MB 680-642619/1-A | Method Blank | Total Recoverable | Water | 6020A | 642619 |
| LCS 680-642619/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 642619 |

### Prep Batch: 642929

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190931-9 | SHM-11-06-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-10 | SHM-99-31A-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-11 | SHP-2016-3A-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-12 | SHP-99-29X-FAL20 | Dissolved | Water | 3005A | |
| MB 680-642929/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-642929/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-190931-9 MS | SHM-11-06-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-9 MSD | SHM-11-06-FAL20 | Dissolved | Water | 3005A | |

### Prep Batch: 642930

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190931-9 | SHM-11-06-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-10 | SHM-99-31A-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-11 | SHP-2016-3A-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-12 | SHP-99-29X-FAL20 | Dissolved | Water | 3005A | |
| MB 680-642930/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-642930/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-190931-9 MS | SHM-11-06-FAL20 | Dissolved | Water | 3005A | |
| 680-190931-9 MSD | SHM-11-06-FAL20 | Dissolved | Water | 3005A | |

### Analysis Batch: 642970

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190931-1 | EPA-PZ-2012-3A-FAL20 | Dissolved | Water | 6010C | 642621 |
| 680-190931-2 | EPA-PZ-2012-3B-FAL20 | Dissolved | Water | 6010C | 642621 |
| 680-190931-3 | PZ-12-01-FAL20 | Dissolved | Water | 6010C | 642621 |
| 680-190931-4 | PZ-12-02-FAL20 | Dissolved | Water | 6010C | 642621 |
| 680-190931-5 | PZ-12-03-FAL20 | Dissolved | Water | 6010C | 642621 |
| 680-190931-6 | SHL-15-FAL20 | Dissolved | Water | 6010C | 642621 |
| 680-190931-7 | SHL-DUP03-FAL20 | Dissolved | Water | 6010C | 642621 |
| 680-190931-8 | SHM-10-15-FAL20 | Dissolved | Water | 6010C | 642621 |
| MB 680-642621/1-A | Method Blank | Total Recoverable | Water | 6010C | 642621 |
| LCS 680-642621/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 642621 |

### Analysis Batch: 643240

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190931-9 | SHM-11-06-FAL20 | Dissolved | Water | 6020A | 642930 |
| 680-190931-10 | SHM-99-31A-FAL20 | Dissolved | Water | 6020A | 642930 |
| 680-190931-11 | SHP-2016-3A-FAL20 | Dissolved | Water | 6020A | 642930 |

## Metals (Continued)

### Analysis Batch: 643240 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190931-12 | SHP-99-29X-FAL20 | Dissolved | Water | 6020A | 642930 |
| MB 680-642930/1-A | Method Blank | Total Recoverable | Water | 6020A | 642930 |
| LCS 680-642930/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 642930 |
| 680-190931-9 MS | SHM-11-06-FAL20 | Dissolved | Water | 6020A | 642930 |
| 680-190931-9 MSD | SHM-11-06-FAL20 | Dissolved | Water | 6020A | 642930 |

### Analysis Batch: 643776

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190931-9 | SHM-11-06-FAL20 | Dissolved | Water | 6010C | 642929 |
| 680-190931-10 | SHM-99-31A-FAL20 | Dissolved | Water | 6010C | 642929 |
| 680-190931-11 | SHP-2016-3A-FAL20 | Dissolved | Water | 6010C | 642929 |
| 680-190931-12 | SHP-99-29X-FAL20 | Dissolved | Water | 6010C | 642929 |
| MB 680-642929/1-A | Method Blank | Total Recoverable | Water | 6010C | 642929 |
| LCS 680-642929/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 642929 |
| 680-190931-9 MS | SHM-11-06-FAL20 | Dissolved | Water | 6010C | 642929 |
| 680-190931-9 MSD | SHM-11-06-FAL20 | Dissolved | Water | 6010C | 642929 |

## General Chemistry

### Analysis Batch: 516387

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190931-1 | EPA-PZ-2012-3A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190931-2 | EPA-PZ-2012-3B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190931-3 | PZ-12-01-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190931-4 | PZ-12-02-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190931-5 | PZ-12-03-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190931-6 | SHL-15-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190931-7 | SHL-DUP03-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190931-8 | SHM-10-15-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190931-9 | SHM-11-06-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190931-10 | SHM-99-31A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190931-11 | SHP-2016-3A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-190931-12 | SHP-99-29X-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-516387/31 | Method Blank | Total/NA | Water | SM 2320B | |
| MB 280-516387/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-516387/30 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| LCS 280-516387/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 680-190931-3 DU | PZ-12-01-FAL20 | Total/NA | Water | SM 2320B | |

### Analysis Batch: 516469

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190931-1 | EPA-PZ-2012-3A-FAL20 | Dissolved | Water | 9060A | |
| 680-190931-2 | EPA-PZ-2012-3B-FAL20 | Dissolved | Water | 9060A | |
| 680-190931-3 | PZ-12-01-FAL20 | Dissolved | Water | 9060A | |
| 680-190931-4 | PZ-12-02-FAL20 | Dissolved | Water | 9060A | |
| 680-190931-5 | PZ-12-03-FAL20 | Dissolved | Water | 9060A | |
| 680-190931-6 | SHL-15-FAL20 | Dissolved | Water | 9060A | |
| 680-190931-7 | SHL-DUP03-FAL20 | Dissolved | Water | 9060A | |
| 680-190931-8 | SHM-10-15-FAL20 | Dissolved | Water | 9060A | |
| 680-190931-9 | SHM-11-06-FAL20 | Dissolved | Water | 9060A | |
| 680-190931-10 | SHM-99-31A-FAL20 | Dissolved | Water | 9060A | |

## General Chemistry (Continued)

### Analysis Batch: 516469 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-190931-11 | SHP-2016-3A-FAL20 | Dissolved | Water | 9060A | |
| 680-190931-12 | SHP-99-29X-FAL20 | Dissolved | Water | 9060A | |
| MB 280-516469/4 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-516469/3 | Lab Control Sample | Dissolved | Water | 9060A | |
| 680-190931-1 MS | EPA-PZ-2012-3A-FAL20 | Dissolved | Water | 9060A | |
| 680-190931-1 MSD | EPA-PZ-2012-3A-FAL20 | Dissolved | Water | 9060A | |
| 680-190931-11 MS | SHP-2016-3A-FAL20 | Dissolved | Water | 9060A | |
| 680-190931-11 MSD | SHP-2016-3A-FAL20 | Dissolved | Water | 9060A | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Client Sample ID: EPA-PZ-2012-3A-FAL20

**Lab Sample ID: 680-190931-1**
**Date Collected: 11/02/20 12:45**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643603 | 11/11/20 23:45 | OK | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642621 | 11/05/20 18:10 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642970 | 11/07/20 19:54 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642619 | 11/05/20 18:08 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642840 | 11/06/20 21:02 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516469 | 11/11/20 18:03 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516387 | 11/11/20 16:49 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: EPA-PZ-2012-3B-FAL20

**Lab Sample ID: 680-190931-2**
**Date Collected: 11/02/20 14:30**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643603 | 11/11/20 23:58 | OK | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642621 | 11/05/20 18:10 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642970 | 11/07/20 20:07 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642619 | 11/05/20 18:08 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642840 | 11/06/20 21:05 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516469 | 11/11/20 18:50 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516387 | 11/11/20 16:55 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: PZ-12-01-FAL20

**Lab Sample ID: 680-190931-3**
**Date Collected: 11/02/20 11:15**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643603 | 11/12/20 00:11 | OK | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642621 | 11/05/20 18:10 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642970 | 11/07/20 20:12 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642619 | 11/05/20 18:08 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642840 | 11/06/20 21:08 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Client Sample ID: PZ-12-01-FAL20

**Lab Sample ID: 680-190931-3**

**Date Collected: 11/02/20 11:15**
**Date Received: 11/03/20 11:38**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516469 | 11/11/20 19:05 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516387 | 11/11/20 17:23 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: PZ-12-02-FAL20

**Lab Sample ID: 680-190931-4**

**Date Collected: 11/02/20 13:00**
**Date Received: 11/03/20 11:38**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643603 | 11/12/20 00:24 | OK | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642621 | 11/05/20 18:10 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642970 | 11/07/20 20:17 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642619 | 11/05/20 18:08 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642840 | 11/06/20 21:11 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516469 | 11/11/20 19:20 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516387 | 11/11/20 17:35 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: PZ-12-03-FAL20

**Lab Sample ID: 680-190931-5**

**Date Collected: 11/02/20 14:10**
**Date Received: 11/03/20 11:38**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643603 | 11/12/20 00:36 | OK | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642621 | 11/05/20 18:10 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642970 | 11/07/20 20:21 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642619 | 11/05/20 18:08 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642840 | 11/06/20 21:14 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516469 | 11/11/20 19:37 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516387 | 11/11/20 17:40 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Client Sample ID: SHL-15-FAL20

**Lab Sample ID: 680-190931-6**
**Date Collected: 11/02/20 14:10**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643603 | 11/11/20 23:06 | OK | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642621 | 11/05/20 18:10 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642970 | 11/07/20 20:26 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642619 | 11/05/20 18:08 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642840 | 11/06/20 21:17 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516469 | 11/11/20 19:51 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516387 | 11/11/20 17:46 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHL-DUP03-FAL20

**Lab Sample ID: 680-190931-7**
**Date Collected: 11/02/20 09:35**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643603 | 11/12/20 00:49 | OK | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642621 | 11/05/20 18:10 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642970 | 11/07/20 20:31 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642619 | 11/05/20 18:08 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642840 | 11/06/20 21:21 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516469 | 11/11/20 20:13 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516387 | 11/11/20 17:52 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHM-10-15-FAL20

**Lab Sample ID: 680-190931-8**
**Date Collected: 11/02/20 13:15**
**Matrix: Water**
**Date Received: 11/03/20 11:38**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643603 | 11/12/20 01:02 | OK | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642621 | 11/05/20 18:10 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 642970 | 11/07/20 20:35 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642619 | 11/05/20 18:08 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 642840 | 11/06/20 21:24 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Client Sample ID: SHM-10-15-FAL20

**Lab Sample ID: 680-190931-8**

**Date Collected: 11/02/20 13:15**
**Date Received: 11/03/20 11:38**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516469 | 11/11/20 21:02 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516387 | 11/11/20 17:58 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-11-06-FAL20

**Lab Sample ID: 680-190931-9**

**Date Collected: 11/02/20 09:35**
**Date Received: 11/03/20 11:38**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643603 | 11/12/20 01:15 | OK | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642929 | 11/07/20 15:41 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643776 | 11/12/20 05:04 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642930 | 11/07/20 15:43 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 20:14 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516469 | 11/11/20 21:19 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516387 | 11/11/20 18:03 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-99-31A-FAL20

**Lab Sample ID: 680-190931-10**

**Date Collected: 11/02/20 11:00**
**Date Received: 11/03/20 11:38**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643603 | 11/12/20 01:28 | OK | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642929 | 11/07/20 15:41 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643776 | 11/12/20 05:28 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642930 | 11/07/20 15:43 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 20:31 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516469 | 11/11/20 21:35 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516387 | 11/11/20 18:08 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Client Sample ID: SHP-2016-3A-FAL20

**Lab Sample ID: 680-190931-11**

**Date Collected: 11/02/20 14:45**
**Date Received: 11/03/20 11:38**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643310 | 11/10/20 21:45 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642929 | 11/07/20 15:41 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643776 | 11/12/20 05:33 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642930 | 11/07/20 15:43 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 20:35 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516469 | 11/11/20 21:54 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516387 | 11/11/20 18:13 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHP-99-29X-FAL20

**Lab Sample ID: 680-190931-12**

**Date Collected: 11/02/20 10:55**
**Date Received: 11/03/20 11:38**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643310 | 11/10/20 21:57 | UI | TAL SAV |
| | Instrument ID: CICK | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642929 | 11/07/20 15:41 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643776 | 11/12/20 05:38 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642930 | 11/07/20 15:43 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 20:38 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516469 | 11/11/20 22:41 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516387 | 11/11/20 18:30 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

## Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| ANAB | Dept. of Defense ELAP | L2463 | 09-22-22 |

## Laboratory: Eurofins TestAmerica, Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| A2LA | Dept. of Defense ELAP | 2907.01 | 10-31-21 |

# Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-190931-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060A | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | TAL SAV |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# STODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29[illegible]
(843) 478.0336, jennifer.singer@arcadis.com

Boston #215

COC #

| | | |
|---|---|---|
| rmer Fort Devens, Long Term Monitoring | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| : DEVENS-LTM | Contact: | |
| WBS Co | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-190931 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 1 | EPA-PZ-2012-1A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-1A | N1 | 23.70 | 28.70 | | |
| 2 | EPA-PZ-2012-1B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-1B | N1 | 73.56 | 78.56 | | |
| 3 | EPA-PZ-2012-2A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-2A | N1 | 18.14 | 23.14 | | |
| 4 | EPA-PZ-2012-2B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-2B | N1 | 73.16 | 78.16 | | |
| 5 | EPA-PZ-2012-3A-FAL20 | WG | 11/2/20 | 1245 | CR | X | X | X | X | X | EPA-PZ-2012-3A | N1 | 19.09 | 24.09 | | |
| 6 | EPA-PZ-2012-3B-FAL20 | WG | 11/2/20 | 1430 | CR | X | X | X | X | X | EPA-PZ-2012-3B | N1 | 68.70 | 73.70 | | |
| 7 | EPA-PZ-2012-4A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4A | N1 | 19.56 | 24.56 | | |
| 8 | EPA-PZ-2012-4B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | N1 | 79.50 | 84.50 | | |
| 9 | EPA-PZ-2012-5A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-5A | N1 | 17.95 | 22.95 | | |
| 10 | EPA-PZ-2012-5B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-5B | N1 | 68.46 | 73.46 | | |
| 11 | EPA-PZ-2012-6A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-6A | N1 | 24.19 | 29.19 | | |
| 12 | EPA-PZ-2012-6B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-6B | N1 | 74.23 | 79.23 | | |
| 13 | EPA-PZ-2012-7A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-7A | N1 | 23.87 | 28.87 | | |
| 14 | EPA-PZ-2012-7B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-7B | N1 | 58.82 | 63.82 | | |
| 15 | EW-01-FAL20 | WG | | | | X | X | X | X | X | EW-01 | N1 | 60.00 | 85.00 | | |
| 16 | EW-04-FAL20 | WG | | | | X | X | X | X | X | EW-04 | N1 | 70.00 | 95.00 | | |
| 17 | N5-P1-FAL20 | WG | | | | X | X | X | X | X | N5-P1 | N1 | 95.50 | 97.50 | | |
| 18 | PZ-12-01-FAL20 | WG | 11-2-20 | 1115 | DC | X | X | X | X | X | PZ-12-01 | N1 | 24.00 | 34.00 | | |

**Relinquished by:** Diane Cooper
**Date** 11-2-20
**Time** 1500
**Received by:** [signature]
SHL_eCOC
11/2/20 15:00

**Date** 11/2/20
**Time** 17:00
**Shipping Date:**
Received by Laboratory: [signature]
Condition:

[signature] 11-03-20 0930
1.8/2.9 (CF) 2.1/3.2°C

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

Boston #215

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | | | | | | |
| 19 | PZ-12-02-FAL20 | WG | 11-2-20 | 1300 | DC | X | X | X | X | X | | | | | | PZ-12-02 | N1 | 24.00 | 34.00 | | |
| 20 | PZ-12-03-FAL20 | WG | 11-2-20 | 1410 | DC | X | X | X | X | X | | | | | | PZ-12-03 | N1 | 24.00 | 34.00 | | |
| 21 | PZ-12-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | PZ-12-04 | N1 | 24.00 | 34.00 | | |
| 22 | PZ-12-05-FAL20 | WG | | | | X | X | X | X | X | | | | | | PZ-12-05 | N1 | 26.00 | 36.00 | | |
| 23 | PZ-12-06-FAL20 | WG | | | | X | X | X | X | X | | | | | | PZ-12-06 | N1 | 25.00 | 35.00 | | |
| 24 | PZ-12-07-FAL20 | WG | | | | X | X | X | X | X | | | | | | PZ-12-07 | N1 | 20.00 | 30.00 | | |
| 25 | PZ-12-08-FAL20 | WG | | | | X | X | X | X | X | | | | | | PZ-12-08 | N1 | 22.00 | 32.00 | | |
| 26 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | | | | | | PZ-12-09 | MS1 | 20.00 | 30.00 | | |
| 27 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | | | | | | PZ-12-09 | N1 | 20.00 | 30.00 | | |
| 28 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | | | | | | PZ-12-09 | SD1 | 20.00 | 30.00 | | |
| 29 | PZ-12-10-FAL20 | WG | | | | X | X | X | X | X | | | | | | PZ-12-10 | N1 | 20.00 | 30.00 | | |
| 30 | SHL-10-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-10 | N1 | 24.00 | 39.00 | | |
| 31 | SHL-11-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-11 | N1 | 12.00 | 27.00 | | |
| 32 | SHL-12-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-12 | N1 | 15.00 | 30.00 | | |
| 33 | SHL-15-FAL20 | WG | 11-2-20 | 1410 | NB | X | X | X | X | X | | | | | | SHL-15 | N1 | 14.00 | 24.00 | | |
| 34 | SHL-19-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-19 | N1 | 20.00 | 30.00 | | |
| 35 | SHL-20-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-20 | N1 | 39.00 | 49.00 | | |
| 36 | SHL-22-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHL-22 | N1 | 105.00 | 115.00 | | |

**Relinquished by:** Diane Clupgue
**Date** 11-2-20
**Time** 15:00
Received by: 11/2/20 15:00
SHL_eCOC

**Date**
**Time**
**Shipping Date:** 11/2/20 17:00
Received by Laboratory:
Condition:

11-03-20 0930
1.8/2.9(gf) 2.1/3.2°C

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

Boston #215

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 37 | SHL-23-FAL20 | WG | | | | X | X | X | X | X | SHL-23 | N1 | 23.00 | 33.00 | | |
| 38 | SHL-24-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | N1 | 110.00 | 120.00 | | |
| 39 | SHL-3-FAL20 | WG | | | | X | X | X | X | X | SHL-3 | N1 | 24.00 | 34.00 | | |
| 40 | SHL-4-FAL20 | WG | | | | X | X | X | X | X | SHL-4 | N1 | 3.00 | 13.00 | | |
| 41 | SHL-5-FAL20 | WG | | | | X | X | X | X | X | SHL-5 | N1 | 3.00 | 13.00 | | |
| 42 | SHL-7-FAL20 | WG | | | | X | X | X | X | X | SHL-7 | N1 | 11.00 | 21.00 | | |
| 43 | SHL-8D-FAL20 | WG | | | | X | X | X | X | X | SHL-8D | N1 | 68.00 | 70.00 | | |
| 44 | SHL-8S-FAL20 | WG | | | | X | X | X | X | X | SHL-8S | N1 | 52.00 | 54.00 | | |
| 45 | SHL-9-FAL20 | WG | | | | X | X | X | X | X | SHL-9 | N1 | 15.00 | 25.00 | | |
| 46 | SHL-DUP01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | FD1 | 25.00 | 35.00 | | |
| 47 | SHL-DUP02-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | FD1 | 39.00 | 49.00 | | |
| 48 | SHL-DUP03-FAL20 | WG | 11-2-20 | 935 | DC | X | X | X | X | X | SHM-11-06 | FD1 | 25.00 | 35.00 | | |
| 49 | SHL-DUP04-FAL20 | WG | | | | X | X | X | X | X | SHP-01-38A | FD1 | 1.50 | 6.50 | | |
| 50 | SHL-DUP05-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | FD1 | 22.00 | 32.00 | | |
| 51 | SHL-DUP06-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | FD1 | 79.50 | 84.50 | | |
| 52 | SHL-DUP07-FAL20 | WG | | | | X | X | X | X | X | SHL-22 | FD1 | 105.00 | 115.00 | | |
| 53 | SHL-DUP08-FAL20 | WG | | | | X | X | X | X | X | SHM-96-5B | FD1 | 80.00 | 90.00 | | |
| 53 | SHL-DUP09-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | FD1 | 110.00 | 120.00 | | |

**Relinquished by:** Diane Clupgne
**Date** 11-2-20
**Time** 1500
**Received by:** 11/2/20 1500
SHL_eCOC

**Date**
**Time**
**Shipping Date:**
Received by Laboratory: 11/2/20 17:00
Condition:

11-03-20 0930

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

Boston #215

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 69 | SHM-10-05A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-05A | N1 | 50.00 | 60.00 | | |
| 70 | SHM-10-06-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06 | N1 | 69.50 | 79.50 | | |
| 71 | SHM-10-06A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06A | N1 | 77.00 | 87.00 | | |
| 72 | SHM-10-07-FAL20 | WG | | | | X | X | X | X | X | SHM-10-07 | N1 | 40.00 | 50.00 | | |
| 73 | SHM-10-08-FAL20 | WG | | | | X | X | X | X | X | SHM-10-08 | N1 | 46.00 | 56.00 | | |
| 74 | SHM-10-10-FAL20 | WG | | | | X | X | X | X | X | SHM-10-10 | N1 | 56.00 | 66.00 | | |
| 75 | SHM-10-11-FAL20 | WG | | | | X | X | X | X | X | SHM-10-11 | N1 | 50.00 | 60.00 | | |
| 76 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | MS1 | 45.00 | 55.00 | | |
| 77 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | N1 | 45.00 | 55.00 | | |
| 78 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | SD1 | 45.00 | 55.00 | | |
| 79 | SHM-10-13-FAL20 | WG | | | | X | X | X | X | X | SHM-10-13 | N1 | 60.00 | 70.00 | | |
| 80 | SHM-10-14-FAL20 | WG | | | | X | X | X | X | X | SHM-10-14 | N1 | 60.00 | 80.00 | | |
| 81 | SHM-10-15-FAL20 | WG | 11/2/20 | 1315 | NB | X | X | X | X | X | SHM-10-15 | N1 | 45.00 | 55.00 | | |
| 82 | SHM-10-16-FAL20 | WG | | | | X | X | X | X | X | SHM-10-16 | N1 | 75.00 | 85.00 | | |
| 83 | SHM-11-02-FAL20 | WG | | | | X | X | X | X | X | SHM-11-02 | N1 | 52.00 | 66.00 | | |
| 84 | SHM-11-06-FAL20 | WG | 11-2-20 | 935 | DC | X | X | X | X | X | SHM-11-06 | N1 | 25.00 | 35.00 | | |
| 85 | SHM-13-01-FAL20 | WG | | | | X | X | X | X | X | SHM-13-01 | N1 | 39.00 | 49.00 | | |
| 86 | SHM-13-02-FAL20 | WG | | | | X | X | X | X | X | SHM-13-02 | N1 | 60.00 | 70.00 | | |

**Relinquished by:** Diane Chipman
**Date** 11-2-20
**Time** 1500
Received by: SHL_eCOC 11/2/20 15:0

**Date**
**Time**
**Shipping Date:** 11/2/20 17:00
Received by Laboratory: 11-03-20 0930
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29412
(843) 478.0336, jennifer.singer@arcadis.com

Boston #215

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 103 | SHM-99-31A-FAL20 | WG | 11-2-20 | 1100 | CR | X | X | X | X | X | SHM-99-31A | N1 | 4.00 | 14.00 | | |
| 104 | SHM-99-31B-FAL20 | WG | | | | X | X | X | X | X | SHM-99-31B | N1 | 50.00 | 60.00 | | |
| 105 | SHM-99-31C-FAL20 | WG | | | | X | X | X | X | X | SHM-99-31C | N1 | 68.00 | 78.00 | | |
| 106 | SHM-99-32X-FAL20 | WG | | | | X | X | X | X | X | SHM-99-32X | N1 | 72.00 | 82.00 | | |
| 107 | SHP-01-36X-FAL20 | WG | | | | X | X | X | X | X | SHP-01-36X | N1 | 3.00 | 8.00 | | |
| 108 | SHP-01-37X-FAL20 | WG | | | | X | X | X | X | X | SHP-01-37X | N1 | 1.00 | 6.00 | | |
| 109 | SHP-01-38A-FAL20 | WG | | | | X | X | X | X | X | SHP-01-38A | N1 | 1.50 | 6.50 | | |
| 110 | SHP-2016-06A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-06A | N1 | 81.00 | 86.00 | | |
| 111 | SHP-2016-06B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-06B | N1 | 102.00 | 112.00 | | |
| 112 | SHP-2016-06C-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-06C | N1 | 123.00 | 133.00 | | |
| 113 | SHP-2016-07A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | N1 | 22.00 | 32.00 | | |
| 114 | SHP-2016-07B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07B | N1 | 70.00 | 80.00 | | |
| 115 | SHP-2016-1A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-1A | N1 | 13.00 | 23.00 | | |
| 116 | SHP-2016-1B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-1B | N1 | 75.00 | 85.00 | | |
| 117 | SHP-2016-2A-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-2A | N1 | 20.00 | 25.00 | | |
| 118 | SHP-2016-2B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-2B | N1 | 80.00 | 85.00 | | |
| 119 | SHP-2016-3A-FAL20 | WG | 11-2-20 | 1445 | CR | X | X | X | X | X | SHP-2016-3A | N1 | 20.00 | 25.00 | | |
| 120 | SHP-2016-3B-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-3B | N1 | 80.00 | 85.00 | | |

**Relinquished by:** Diane Clupper
**Date** 11-2-20
**Time** 1500
Received by: 11/2/20 1510
SHL_eCOC

**Date**
**Time**
**Shipping Date:** 11/2/20 17:00
Received by Laboratory:
Condition:

11-03-20 0930

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

Boston #215

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| **WG** | Ground Water |

| Code | Container/Preservative |
|---|---|
| **3** | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| **5** | 1x 125mL plastic, Cool < 6degC |
| **9** | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| **46** | 1x 250mL, plastic, Cool < 6degC |

| | | | | | **Analytical Test Method** | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 | | | | | **46** | **9** | **9** | **5** | **3** | | | | | | | | | | | |
| | Sample ID | Matrix | Date | Time | Samp Init. | | | | | | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
| **121** | SHP-2016-4A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-4A | N1 | 25.00 | 30.00 | | |
| **122** | SHP-2016-4B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-4B | N1 | 85.00 | 90.00 | | |
| **123** | SHP-2016-5A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-5A | N1 | 25.00 | 30.00 | | |
| **124** | SHP-2016-5B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-5B | N1 | 85.00 | 90.00 | | |
| **125** | SHP-99-29X-FAL20 | WG | 11-2-20 | 1055 | NB | X | X | X | X | X | | | | | | SHP-99-29X | N1 | 19.00 | 29.00 | | |

**Turnaround Time: NA**

**Relinquished by:** Diane Clyburne
**Date** 11-2-20
**Time** 1500
Received by: 11/2/20 1500
SHL_eCOC

**Date**
**Time**
**Shipping Date:**
Received by Laboratory: 11/2/20 17:00
Condition:

11-03-20 0930

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins | Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-631752.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 2 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-190931-1 |
| Address: 4955 Yarrow Street, | Due Date Requested: 11/13/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| EPA-PZ-2012-3A-FAL20 (680-190931-1) | 11/2/20 | 12:45 Eastern | | Water | | | X | X | 2 | |
| EPA-PZ-2012-3B-FAL20 (680-190931-2) | 11/2/20 | 14:30 Eastern | | Water | | | X | X | 2 | |
| PZ12-01-FAL20 (680-190931-3) | 11/2/20 | 11:15 Eastern | | Water | | | X | X | 2 | |
| PZ-12-02-FAL20 (680-190931-4) | 11/2/20 | 13:00 Eastern | | Water | | | X | X | 2 | |
| PZ-12-03-FAL20 (680-190931-5) | 11/2/20 | 14:10 Eastern | | Water | | | X | X | 2 | |
| SHL-15-FAL20 (680-190931-6) | 11/2/20 | 14:10 Eastern | | Water | | | X | X | 2 | |
| SHL-DUP03-FAL20 (680-190931-7) | 11/2/20 | 09:35 Eastern | | Water | | | X | X | 2 | |
| SHL-10-15-FAL20 (680-190931-8) | 11/2/20 | 13:15 Eastern | | Water | | | X | X | 2 | |
| SHL-11-06-FAL20 (680-190931-9) | 11/2/20 | 09:35 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | |
|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |

| | | | | | |
|---|---|---|---|---|---|
| Relinquished by: | Date/Time: 11-3-20 1730 | Company TA | Received by: | Date/Time: 11/4/20 0940 | Company ETA Denver |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| | | |
|---|---|---|
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 1.1C CF-0.3C IR#11 |

Ver: 01/16/2019

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins | Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-631752.2 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 2 of 2 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-190931-1 |
| Address: 4955 Yarrow Street, | Due Date Requested: 11/13/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SHM-99--31A-FAL20 (680-190931-10) | 11/2/20 | 11:00 Eastern | | Water | | | X | X | 2 | |
| SHP-2016-3A-FAL20 (680-190931-11) | 11/2/20 | 14:45 Eastern | | Water | | | X | X | 2 | |
| SHP-99-29X-FAL20 (680-190931-12) | 11/2/20 | 10:55 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | | | |
|---|---|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
| Relinquished by: | Date/Time: 11-3-20 1730 | Company TA | Received by: | Date/Time: 11/4/20 0940 | Company ETA Denver |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | | Cooler Temperature(s) °C and Other Remarks: | | |

Ver: 01/16/2019

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-190931-1

**Login Number: 190931**
**List Number: 1**
**Creator: Banda, Christy S**

**List Source: Eurofins TestAmerica, Savannah**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | N/A | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-190931-1

**Login Number: 190931**
**List Number: 2**
**Creator: Pottruff, Reed W**

**List Source: Eurofins TestAmerica, Denver**
**List Creation: 11/05/20 02:14 AM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | N/A | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

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# ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-191084-1
Client Project/Site: Fort Devens

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

*Authorized for release by:*
*11/17/2020 9:33:23 AM*

Kathryn Smith, Client Service Manager
(912)250-0275
Kathy.Smith@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

# Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

# Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 680-191084-1 | PZ-12-04-FAL20 | Water | 11/02/20 16:00 | 11/05/20 09:30 | |
| 680-191084-2 | PZ-12-05-FAL20 | Water | 11/03/20 12:55 | 11/05/20 09:30 | |
| 680-191084-3 | PZ-12-06-FAL20 | Water | 11/03/20 14:00 | 11/05/20 09:30 | |
| 680-191084-4 | SHL-12-FAL20 | Water | 11/02/20 15:45 | 11/05/20 09:30 | |
| 680-191084-5 | SHL-22-FAL20 | Water | 11/03/20 13:15 | 11/05/20 09:30 | |
| 680-191084-6 | SHL-7-FAL20 | Water | 11/03/20 10:10 | 11/05/20 09:30 | |
| 680-191084-7 | SHL-9-FAL20 | Water | 11/03/20 15:10 | 11/05/20 09:30 | |
| 680-191084-8 | SHL-DUP07-FAL20 | Water | 11/03/20 13:20 | 11/05/20 09:30 | |
| 680-191084-9 | SHM-11-02-FAL20 | Water | 11/03/20 14:50 | 11/05/20 09:30 | |
| 680-191084-10 | SHM-93-22B-FAL20 | Water | 11/03/20 10:50 | 11/05/20 09:30 | |
| 680-191084-11 | SHM-93-22C-FAL20 | Water | 11/03/20 11:45 | 11/05/20 09:30 | |
| 680-191084-12 | SHP-2016-3B-FAL20 | Water | 11/03/20 09:20 | 11/05/20 09:30 | |

## Job ID: 680-191084-1

**Laboratory: Eurofins TestAmerica, Savannah**

**Narrative**

# CASE NARRATIVE
# Client: Seres Engineering & Services LLC
# Project: Fort Devens

## Report Number: 680-191084-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 11/05/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.1º C and 3.8º C.

**METALS (ICP) - DISSOLVED**
Samples PZ-12-04-FAL20 (680-191084-1), PZ-12-05-FAL20 (680-191084-2), PZ-12-06-FAL20 (680-191084-3), SHL-12-FAL20 (680-191084-4), SHL-22-FAL20 (680-191084-5), SHL-7-FAL20 (680-191084-6), SHL-9-FAL20 (680-191084-7), SHL-DUP07-FAL20 (680-191084-8), SHM-11-02-FAL20 (680-191084-9), SHM-93-22B-FAL20 (680-191084-10), SHM-93-22C-FAL20 (680-191084-11) and SHP-2016-3B-FAL20 (680-191084-12) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/07/2020 and analyzed on 11/10/2020.

Iron and Manganese were detected in method blank MB 680-642936/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Iron and Manganese recovered low for the MS of sample PZ-12-04-FAL20MS (680-191084-1) in batch 680-643527.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples PZ-12-04-FAL20 (680-191084-1), PZ-12-05-FAL20 (680-191084-2), PZ-12-06-FAL20 (680-191084-3), SHL-12-FAL20 (680-191084-4), SHL-22-FAL20 (680-191084-5), SHL-7-FAL20 (680-191084-6), SHL-9-FAL20 (680-191084-7), SHL-DUP07-FAL20 (680-191084-8), SHM-11-02-FAL20 (680-191084-9), SHM-93-22B-FAL20 (680-191084-10), SHM-93-22C-FAL20 (680-191084-11) and SHP-2016-3B-FAL20 (680-191084-12) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 11/07/2020 and analyzed on 11/09/2020.

Arsenic recovered low for the MS/MSD of sample PZ-12-04-FAL20 (680-191084-1) in batch 680-643240.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples PZ-12-04-FAL20 (680-191084-1), PZ-12-05-FAL20 (680-191084-2), PZ-12-06-FAL20 (680-191084-3), SHL-12-FAL20 (680-191084-4), SHL-22-FAL20 (680-191084-5), SHL-7-FAL20 (680-191084-6), SHL-9-FAL20 (680-191084-7), SHL-DUP07-FAL20 (680-191084-8), SHM-11-02-FAL20 (680-191084-9), SHM-93-22B-FAL20 (680-191084-10), SHM-93-22C-FAL20 (680-191084-11) and SHP-2016-3B-FAL20 (680-191084-12) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 11/12/2020 and 11/13/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**
Samples PZ-12-04-FAL20 (680-191084-1), PZ-12-05-FAL20 (680-191084-2), PZ-12-06-FAL20 (680-191084-3), SHL-12-FAL20

## Job ID: 680-191084-1 (Continued)

### Laboratory: Eurofins TestAmerica, Savannah (Continued)

(680-191084-4), SHL-22-FAL20 (680-191084-5), SHL-7-FAL20 (680-191084-6), SHL-9-FAL20 (680-191084-7), SHL-DUP07-FAL20 (680-191084-8), SHM-11-02-FAL20 (680-191084-9), SHM-93-22B-FAL20 (680-191084-10), SHM-93-22C-FAL20 (680-191084-11) and SHP-2016-3B-FAL20 (680-191084-12) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 11/13/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL ORGANIC CARBON (TOC)**

Samples PZ-12-04-FAL20 (680-191084-1), PZ-12-05-FAL20 (680-191084-2), PZ-12-06-FAL20 (680-191084-3), SHL-12-FAL20 (680-191084-4), SHL-22-FAL20 (680-191084-5), SHL-7-FAL20 (680-191084-6), SHL-9-FAL20 (680-191084-7), SHL-DUP07-FAL20 (680-191084-8), SHM-11-02-FAL20 (680-191084-9), SHM-93-22B-FAL20 (680-191084-10), SHM-93-22C-FAL20 (680-191084-11) and SHP-2016-3B-FAL20 (680-191084-12) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 11/13/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Client Sample ID: PZ-12-04-FAL20

**Lab Sample ID: 680-191084-1**
**Date Collected: 11/02/20 16:00**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 61 | | 0.50 | 0.20 | mg/L | | | 11/13/20 20:04 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/13/20 20:04 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 75000 | J | 50 | 17 | ug/L | | 11/07/20 16:34 | 11/10/20 15:04 | 1 |
| Manganese | 1900 | J | 10 | 1.0 | ug/L | | 11/07/20 16:34 | 11/10/20 15:04 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 710 | J | 3.0 | 1.5 | ug/L | | 11/07/20 16:36 | 11/09/20 14:14 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 160 | | 10 | 3.1 | mg/L | | | 11/12/20 23:44 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.3 | | 1.0 | 0.35 | mg/L | | | 11/13/20 17:30 | 1 |

## Client Sample ID: PZ-12-05-FAL20

**Lab Sample ID: 680-191084-2**
**Date Collected: 11/03/20 12:55**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 12 | | 0.50 | 0.20 | mg/L | | | 11/13/20 20:17 | 1 |
| Sulfate | 7.0 | | 1.0 | 0.40 | mg/L | | | 11/13/20 20:17 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 38000 | | 50 | 17 | ug/L | | 11/07/20 16:34 | 11/10/20 15:27 | 1 |
| Manganese | 3500 | | 10 | 1.0 | ug/L | | 11/07/20 16:34 | 11/10/20 15:27 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 140 | | 3.0 | 1.5 | ug/L | | 11/07/20 16:36 | 11/09/20 14:32 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 120 | | 10 | 3.1 | mg/L | | | 11/13/20 23:03 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.3 | | 1.0 | 0.35 | mg/L | | | 11/13/20 18:21 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Client Sample ID: PZ-12-06-FAL20

**Lab Sample ID: 680-191084-3**
**Date Collected: 11/03/20 14:00**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 7.5 | | 0.50 | 0.20 | mg/L | | | 11/13/20 19:25 | 1 |
| Sulfate | 23 | | 1.0 | 0.40 | mg/L | | | 11/13/20 19:25 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 7100 | | 50 | 17 | ug/L | | 11/07/20 16:34 | 11/10/20 15:31 | 1 |
| Manganese | 2400 | | 10 | 1.0 | ug/L | | 11/07/20 16:34 | 11/10/20 15:31 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 13 | | 3.0 | 1.5 | ug/L | | 11/07/20 16:36 | 11/09/20 14:35 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 110 | | 10 | 3.1 | mg/L | | | 11/13/20 23:08 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.5 | | 1.0 | 0.35 | mg/L | | | 11/13/20 18:55 | 1 |

## Client Sample ID: SHL-12-FAL20

**Lab Sample ID: 680-191084-4**
**Date Collected: 11/02/20 15:45**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 57 | | 0.50 | 0.20 | mg/L | | | 11/13/20 20:30 | 1 |
| Sulfate | 90 | | 1.0 | 0.40 | mg/L | | | 11/13/20 20:30 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 130 | | 50 | 17 | ug/L | | 11/07/20 16:34 | 11/10/20 15:36 | 1 |
| Manganese | 180 | | 10 | 1.0 | ug/L | | 11/07/20 16:34 | 11/10/20 15:36 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2.3 | J | 3.0 | 1.5 | ug/L | | 11/07/20 16:36 | 11/09/20 14:39 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 63 | | 10 | 3.1 | mg/L | | | 11/12/20 23:55 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.7 | | 1.0 | 0.35 | mg/L | | | 11/13/20 19:15 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Client Sample ID: SHL-22-FAL20

**Lab Sample ID: 680-191084-5**
**Date Collected: 11/03/20 13:15**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 29 | | 0.50 | 0.20 | mg/L | | | 11/13/20 20:43 | 1 |
| Sulfate | 8.9 | | 1.0 | 0.40 | mg/L | | | 11/13/20 20:43 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 40 | J | 50 | 17 | ug/L | | 11/07/20 16:34 | 11/10/20 15:50 | 1 |
| Manganese | 7700 | | 10 | 1.0 | ug/L | | 11/07/20 16:34 | 11/10/20 15:50 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2.4 | J | 3.0 | 1.5 | ug/L | | 11/07/20 16:36 | 11/09/20 14:50 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 320 | | 10 | 3.1 | mg/L | | | 11/13/20 00:02 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.5 | | 1.0 | 0.35 | mg/L | | | 11/13/20 19:32 | 1 |

## Client Sample ID: SHL-7-FAL20

**Lab Sample ID: 680-191084-6**
**Date Collected: 11/03/20 10:10**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 73 | | 0.50 | 0.20 | mg/L | | | 11/13/20 20:56 | 1 |
| Sulfate | 3.0 | | 1.0 | 0.40 | mg/L | | | 11/13/20 20:56 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 700 | | 50 | 17 | ug/L | | 11/07/20 16:34 | 11/10/20 15:55 | 1 |
| Manganese | 63 | | 10 | 1.0 | ug/L | | 11/07/20 16:34 | 11/10/20 15:55 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/07/20 16:36 | 11/09/20 14:53 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 39 | | 10 | 3.1 | mg/L | | | 11/13/20 00:06 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.0 | | 1.0 | 0.35 | mg/L | | | 11/13/20 19:49 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Client Sample ID: SHL-9-FAL20

**Lab Sample ID: 680-191084-7**

**Date Collected: 11/03/20 15:10**
**Date Received: 11/05/20 09:30**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 50 | | 0.50 | 0.20 | mg/L | | | 11/13/20 21:08 | 1 |
| Sulfate | 1.6 | | 1.0 | 0.40 | mg/L | | | 11/13/20 21:08 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 6200 | | 50 | 17 | ug/L | | 11/07/20 16:34 | 11/10/20 15:59 | 1 |
| Manganese | 390 | | 10 | 1.0 | ug/L | | 11/07/20 16:34 | 11/10/20 15:59 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 35 | | 3.0 | 1.5 | ug/L | | 11/07/20 16:36 | 11/09/20 14:57 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 69 | | 10 | 3.1 | mg/L | | | 11/13/20 00:11 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 5.7 | | 1.0 | 0.35 | mg/L | | | 11/13/20 20:16 | 1 |

## Client Sample ID: SHL-DUP07-FAL20

**Lab Sample ID: 680-191084-8**

**Date Collected: 11/03/20 13:20**
**Date Received: 11/05/20 09:30**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 29 | | 0.50 | 0.20 | mg/L | | | 11/13/20 21:21 | 1 |
| Sulfate | 8.9 | | 1.0 | 0.40 | mg/L | | | 11/13/20 21:21 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 46 | J | 50 | 17 | ug/L | | 11/07/20 16:34 | 11/10/20 16:04 | 1 |
| Manganese | 8200 | | 10 | 1.0 | ug/L | | 11/07/20 16:34 | 11/10/20 16:04 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2.2 | J | 3.0 | 1.5 | ug/L | | 11/07/20 16:36 | 11/09/20 15:00 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 320 | | 10 | 3.1 | mg/L | | | 11/13/20 00:19 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.4 | | 1.0 | 0.35 | mg/L | | | 11/13/20 21:14 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Client Sample ID: SHM-11-02-FAL20

**Lab Sample ID: 680-191084-9**

**Date Collected: 11/03/20 14:50**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 42 | | 0.50 | 0.20 | mg/L | | | 11/13/20 21:34 | 1 |
| Sulfate | 0.85 | J | 1.0 | 0.40 | mg/L | | | 11/13/20 21:34 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 11000 | | 50 | 17 | ug/L | | 11/07/20 16:34 | 11/10/20 16:08 | 1 |
| Manganese | 830 | | 10 | 1.0 | ug/L | | 11/07/20 16:34 | 11/10/20 16:08 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 12 | | 3.0 | 1.5 | ug/L | | 11/07/20 16:36 | 11/09/20 15:04 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 250 | | 10 | 3.1 | mg/L | | | 11/13/20 00:26 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.3 | | 1.0 | 0.35 | mg/L | | | 11/13/20 21:34 | 1 |

## Client Sample ID: SHM-93-22B-FAL20

**Lab Sample ID: 680-191084-10**

**Date Collected: 11/03/20 10:50**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 34 | | 0.50 | 0.20 | mg/L | | | 11/13/20 21:47 | 1 |
| Sulfate | 7.8 | | 1.0 | 0.40 | mg/L | | | 11/13/20 21:47 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 12000 | | 50 | 17 | ug/L | | 11/07/20 16:34 | 11/10/20 16:13 | 1 |
| Manganese | 9000 | | 10 | 1.0 | ug/L | | 11/07/20 16:34 | 11/10/20 16:13 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 300 | | 3.0 | 1.5 | ug/L | | 11/07/20 16:36 | 11/09/20 15:07 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 220 | | 10 | 3.1 | mg/L | | | 11/13/20 23:26 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.4 | | 1.0 | 0.35 | mg/L | | | 11/13/20 21:51 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Client Sample ID: SHM-93-22C-FAL20

**Lab Sample ID: 680-191084-11**

**Date Collected: 11/03/20 11:45**
**Date Received: 11/05/20 09:30**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 20 | | 0.50 | 0.20 | mg/L | | | 11/13/20 22:52 | 1 |
| Sulfate | 5.1 | | 1.0 | 0.40 | mg/L | | | 11/13/20 22:52 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 30 | J | 50 | 17 | ug/L | | 11/07/20 16:34 | 11/10/20 16:18 | 1 |
| Manganese | 3.2 | J | 10 | 1.0 | ug/L | | 11/07/20 16:34 | 11/10/20 16:18 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 4.4 | | 3.0 | 1.5 | ug/L | | 11/07/20 16:36 | 11/09/20 15:11 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 120 | | 10 | 3.1 | mg/L | | | 11/13/20 23:31 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.8 | | 1.0 | 0.35 | mg/L | | | 11/13/20 22:15 | 1 |

## Client Sample ID: SHP-2016-3B-FAL20

**Lab Sample ID: 680-191084-12**

**Date Collected: 11/03/20 09:20**
**Date Received: 11/05/20 09:30**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 5.9 | | 0.50 | 0.20 | mg/L | | | 11/13/20 23:30 | 1 |
| Sulfate | 1.8 | | 1.0 | 0.40 | mg/L | | | 11/13/20 23:30 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 29000 | | 50 | 17 | ug/L | | 11/07/20 16:34 | 11/10/20 16:22 | 1 |
| Manganese | 2200 | | 10 | 1.0 | ug/L | | 11/07/20 16:34 | 11/10/20 16:22 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 180 | | 3.0 | 1.5 | ug/L | | 11/07/20 16:36 | 11/09/20 15:14 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 110 | | 10 | 3.1 | mg/L | | | 11/13/20 23:36 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.9 | | 1.0 | 0.35 | mg/L | | | 11/13/20 23:07 | 1 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-643908/2** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 643908**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/13/20 11:17 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/13/20 11:17 | 1 |

**Lab Sample ID: LCS 680-643908/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 643908**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.0 | | mg/L | | 100 | 87 - 111 |
| Sulfate | 10.0 | 10.6 | | mg/L | | 106 | 87 - 112 |

**Lab Sample ID: LCSD 680-643908/4** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 643908**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.97 | | mg/L | | 100 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.6 | | mg/L | | 106 | 87 - 112 | 0 | 15 |

**Lab Sample ID: 680-191084-3 MS** — **Client Sample ID: PZ-12-06-FAL20**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 643908**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 7.5 | | 10.0 | 17.8 | | mg/L | | 103 | 87 - 111 |
| Sulfate | 23 | | 10.0 | 33.2 | | mg/L | | 101 | 87 - 112 |

**Lab Sample ID: 680-191084-3 MSD** — **Client Sample ID: PZ-12-06-FAL20**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 643908**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 7.5 | | 10.0 | 17.9 | | mg/L | | 104 | 87 - 111 | 0 | 15 |
| Sulfate | 23 | | 10.0 | 33.2 | | mg/L | | 101 | 87 - 112 | 0 | 15 |

**Lab Sample ID: MB 680-643909/33** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 643909**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/13/20 22:13 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/13/20 22:13 | 1 |

**Lab Sample ID: LCS 680-643909/34** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 643909**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.5 | | mg/L | | 105 | 87 - 111 |
| Sulfate | 10.0 | 10.3 | | mg/L | | 103 | 87 - 112 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: LCSD 680-643909/35**
**Matrix: Water**
**Analysis Batch: 643909**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 10.0 | 10.5 | | mg/L | | 105 | 87 - 111 | 0 | 15 |
| Sulfate | | | 10.0 | 10.4 | | mg/L | | 104 | 87 - 112 | 1 | 15 |

**Lab Sample ID: 680-191084-11 MS**
**Matrix: Water**
**Analysis Batch: 643909**

**Client Sample ID: SHM-93-22C-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 20 | | 10.0 | 30.5 | | mg/L | | 102 | 87 - 111 | | |
| Sulfate | 5.1 | | 10.0 | 15.3 | | mg/L | | 102 | 87 - 112 | | |

**Lab Sample ID: 680-191084-11 MSD**
**Matrix: Water**
**Analysis Batch: 643909**

**Client Sample ID: SHM-93-22C-FAL20**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 20 | | 10.0 | 30.6 | | mg/L | | 102 | 87 - 111 | 0 | 15 |
| Sulfate | 5.1 | | 10.0 | 15.4 | | mg/L | | 103 | 87 - 112 | 0 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-642936/1-A**
**Matrix: Water**
**Analysis Batch: 643527**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 642936**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17.1 | J | 50 | 17 | ug/L | | 11/07/20 16:34 | 11/10/20 14:55 | 1 |
| Manganese | 2.74 | J | 10 | 1.0 | ug/L | | 11/07/20 16:34 | 11/10/20 14:55 | 1 |

**Lab Sample ID: LCS 680-642936/2-A**
**Matrix: Water**
**Analysis Batch: 643527**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 642936**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | | | 5000 | 4880 | | ug/L | | 98 | 87 - 115 | | |
| Manganese | | | 400 | 396 | | ug/L | | 99 | 90 - 114 | | |

**Lab Sample ID: 680-191084-1 MS**
**Matrix: Water**
**Analysis Batch: 643527**

**Client Sample ID: PZ-12-04-FAL20**
**Prep Type: Dissolved**
**Prep Batch: 642936**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 75000 | J | 5000 | 78600 | 4 | ug/L | | 67 | 87 - 115 | | |
| Manganese | 1900 | J | 400 | 2260 | 4 | ug/L | | 89 | 90 - 114 | | |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 680-191084-1 MSD** — **Client Sample ID: PZ-12-04-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643527** — **Prep Batch: 642936**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 75000 | J | 5000 | 80600 | 4 | ug/L | | 107 | 87 - 115 | 3 | 20 |
| Manganese | 1900 | J | 400 | 2310 | 4 | ug/L | | 103 | 90 - 114 | 2 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-642937/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 643240** — **Prep Batch: 642937**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/07/20 16:36 | 11/09/20 14:06 | 1 |

**Lab Sample ID: LCS 680-642937/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 643240** — **Prep Batch: 642937**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 93.0 | | ug/L | | 93 | 84 - 116 |

**Lab Sample ID: 680-191084-1 MS** — **Client Sample ID: PZ-12-04-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643240** — **Prep Batch: 642937**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 710 | J | 100 | 749 | 4 | ug/L | | 40 | 84 - 116 |

**Lab Sample ID: 680-191084-1 MSD** — **Client Sample ID: PZ-12-04-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643240** — **Prep Batch: 642937**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 710 | J | 100 | 715 | 4 | ug/L | | 7 | 84 - 116 | 5 | 20 |

## Method: 9060A - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-516757/4** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516757**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/13/20 16:52 | 1 |

**Lab Sample ID: LCS 280-516757/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516757**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 25.5 | | mg/L | | 102 | 88 - 112 |

## Method: 9060A - Organic Carbon, Dissolved (DOC) (Continued)

**Lab Sample ID: 680-191084-1 MS** — **Client Sample ID: PZ-12-04-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516757**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.3 | | 25.0 | 27.6 | | mg/L | | 101 | 88 - 112 | | |

**Lab Sample ID: 680-191084-1 MSD** — **Client Sample ID: PZ-12-04-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516757**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.3 | | 25.0 | 27.6 | | mg/L | | 101 | 88 - 112 | 0 | 15 |

**Lab Sample ID: 680-191084-11 MS** — **Client Sample ID: SHM-93-22C-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516757**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.8 | | 25.0 | 27.7 | | mg/L | | 100 | 88 - 112 | | |

**Lab Sample ID: 680-191084-11 MSD** — **Client Sample ID: SHM-93-22C-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 516757**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 2.8 | | 25.0 | 27.6 | | mg/L | | 99 | 88 - 112 | 0 | 15 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-516589/58** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516589**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/12/20 23:39 | 1 |

**Lab Sample ID: LCS 280-516589/57** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516589**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 193 | | mg/L | | 96 | 89 - 109 | | |

**Lab Sample ID: 680-191084-1 DU** — **Client Sample ID: PZ-12-04-FAL20**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 516589**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 160 | | | 153 | | mg/L | | | | 3 | 10 |

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: MB 280-516826/58**
**Matrix: Water**
**Analysis Batch: 516826**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/13/20 22:10 | 1 |

**Lab Sample ID: LCS 280-516826/57**
**Matrix: Water**
**Analysis Batch: 516826**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | | | 200 | 192 | | mg/L | | 96 | 89 - 109 | | |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## HPLC/IC

### Analysis Batch: 643908

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191084-1 | PZ-12-04-FAL20 | Total/NA | Water | 9056A | |
| 680-191084-2 | PZ-12-05-FAL20 | Total/NA | Water | 9056A | |
| 680-191084-3 | PZ-12-06-FAL20 | Total/NA | Water | 9056A | |
| 680-191084-4 | SHL-12-FAL20 | Total/NA | Water | 9056A | |
| 680-191084-5 | SHL-22-FAL20 | Total/NA | Water | 9056A | |
| 680-191084-6 | SHL-7-FAL20 | Total/NA | Water | 9056A | |
| 680-191084-7 | SHL-9-FAL20 | Total/NA | Water | 9056A | |
| 680-191084-8 | SHL-DUP07-FAL20 | Total/NA | Water | 9056A | |
| 680-191084-9 | SHM-11-02-FAL20 | Total/NA | Water | 9056A | |
| 680-191084-10 | SHM-93-22B-FAL20 | Total/NA | Water | 9056A | |
| MB 680-643908/2 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-643908/3 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-643908/4 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-191084-3 MS | PZ-12-06-FAL20 | Total/NA | Water | 9056A | |
| 680-191084-3 MSD | PZ-12-06-FAL20 | Total/NA | Water | 9056A | |

### Analysis Batch: 643909

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191084-11 | SHM-93-22C-FAL20 | Total/NA | Water | 9056A | |
| 680-191084-12 | SHP-2016-3B-FAL20 | Total/NA | Water | 9056A | |
| MB 680-643909/33 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-643909/34 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-643909/35 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 680-191084-11 MS | SHM-93-22C-FAL20 | Total/NA | Water | 9056A | |
| 680-191084-11 MSD | SHM-93-22C-FAL20 | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 642936

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191084-1 | PZ-12-04-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-2 | PZ-12-05-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-3 | PZ-12-06-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-4 | SHL-12-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-5 | SHL-22-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-6 | SHL-7-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-7 | SHL-9-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-8 | SHL-DUP07-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-9 | SHM-11-02-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-10 | SHM-93-22B-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-11 | SHM-93-22C-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-12 | SHP-2016-3B-FAL20 | Dissolved | Water | 3005A | |
| MB 680-642936/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-642936/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191084-1 MS | PZ-12-04-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-1 MSD | PZ-12-04-FAL20 | Dissolved | Water | 3005A | |

### Prep Batch: 642937

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191084-1 | PZ-12-04-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-2 | PZ-12-05-FAL20 | Dissolved | Water | 3005A | |

## Metals (Continued)

### Prep Batch: 642937 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191084-3 | PZ-12-06-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-4 | SHL-12-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-5 | SHL-22-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-6 | SHL-7-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-7 | SHL-9-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-8 | SHL-DUP07-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-9 | SHM-11-02-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-10 | SHM-93-22B-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-11 | SHM-93-22C-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-12 | SHP-2016-3B-FAL20 | Dissolved | Water | 3005A | |
| MB 680-642937/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-642937/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191084-1 MS | PZ-12-04-FAL20 | Dissolved | Water | 3005A | |
| 680-191084-1 MSD | PZ-12-04-FAL20 | Dissolved | Water | 3005A | |

### Analysis Batch: 643240

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191084-1 | PZ-12-04-FAL20 | Dissolved | Water | 6020A | 642937 |
| 680-191084-2 | PZ-12-05-FAL20 | Dissolved | Water | 6020A | 642937 |
| 680-191084-3 | PZ-12-06-FAL20 | Dissolved | Water | 6020A | 642937 |
| 680-191084-4 | SHL-12-FAL20 | Dissolved | Water | 6020A | 642937 |
| 680-191084-5 | SHL-22-FAL20 | Dissolved | Water | 6020A | 642937 |
| 680-191084-6 | SHL-7-FAL20 | Dissolved | Water | 6020A | 642937 |
| 680-191084-7 | SHL-9-FAL20 | Dissolved | Water | 6020A | 642937 |
| 680-191084-8 | SHL-DUP07-FAL20 | Dissolved | Water | 6020A | 642937 |
| 680-191084-9 | SHM-11-02-FAL20 | Dissolved | Water | 6020A | 642937 |
| 680-191084-10 | SHM-93-22B-FAL20 | Dissolved | Water | 6020A | 642937 |
| 680-191084-11 | SHM-93-22C-FAL20 | Dissolved | Water | 6020A | 642937 |
| 680-191084-12 | SHP-2016-3B-FAL20 | Dissolved | Water | 6020A | 642937 |
| MB 680-642937/1-A | Method Blank | Total Recoverable | Water | 6020A | 642937 |
| LCS 680-642937/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 642937 |
| 680-191084-1 MS | PZ-12-04-FAL20 | Dissolved | Water | 6020A | 642937 |
| 680-191084-1 MSD | PZ-12-04-FAL20 | Dissolved | Water | 6020A | 642937 |

### Analysis Batch: 643527

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191084-1 | PZ-12-04-FAL20 | Dissolved | Water | 6010C | 642936 |
| 680-191084-2 | PZ-12-05-FAL20 | Dissolved | Water | 6010C | 642936 |
| 680-191084-3 | PZ-12-06-FAL20 | Dissolved | Water | 6010C | 642936 |
| 680-191084-4 | SHL-12-FAL20 | Dissolved | Water | 6010C | 642936 |
| 680-191084-5 | SHL-22-FAL20 | Dissolved | Water | 6010C | 642936 |
| 680-191084-6 | SHL-7-FAL20 | Dissolved | Water | 6010C | 642936 |
| 680-191084-7 | SHL-9-FAL20 | Dissolved | Water | 6010C | 642936 |
| 680-191084-8 | SHL-DUP07-FAL20 | Dissolved | Water | 6010C | 642936 |
| 680-191084-9 | SHM-11-02-FAL20 | Dissolved | Water | 6010C | 642936 |
| 680-191084-10 | SHM-93-22B-FAL20 | Dissolved | Water | 6010C | 642936 |
| 680-191084-11 | SHM-93-22C-FAL20 | Dissolved | Water | 6010C | 642936 |
| 680-191084-12 | SHP-2016-3B-FAL20 | Dissolved | Water | 6010C | 642936 |
| MB 680-642936/1-A | Method Blank | Total Recoverable | Water | 6010C | 642936 |
| LCS 680-642936/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 642936 |
| 680-191084-1 MS | PZ-12-04-FAL20 | Dissolved | Water | 6010C | 642936 |

## Metals (Continued)

### Analysis Batch: 643527 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191084-1 MSD | PZ-12-04-FAL20 | Dissolved | Water | 6010C | 642936 |

## General Chemistry

### Analysis Batch: 516589

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191084-1 | PZ-12-04-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191084-4 | SHL-12-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191084-5 | SHL-22-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191084-6 | SHL-7-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191084-7 | SHL-9-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191084-8 | SHL-DUP07-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191084-9 | SHM-11-02-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-516589/58 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-516589/57 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 680-191084-1 DU | PZ-12-04-FAL20 | Total/NA | Water | SM 2320B | |

### Analysis Batch: 516757

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191084-1 | PZ-12-04-FAL20 | Dissolved | Water | 9060A | |
| 680-191084-2 | PZ-12-05-FAL20 | Dissolved | Water | 9060A | |
| 680-191084-3 | PZ-12-06-FAL20 | Dissolved | Water | 9060A | |
| 680-191084-4 | SHL-12-FAL20 | Dissolved | Water | 9060A | |
| 680-191084-5 | SHL-22-FAL20 | Dissolved | Water | 9060A | |
| 680-191084-6 | SHL-7-FAL20 | Dissolved | Water | 9060A | |
| 680-191084-7 | SHL-9-FAL20 | Dissolved | Water | 9060A | |
| 680-191084-8 | SHL-DUP07-FAL20 | Dissolved | Water | 9060A | |
| 680-191084-9 | SHM-11-02-FAL20 | Dissolved | Water | 9060A | |
| 680-191084-10 | SHM-93-22B-FAL20 | Dissolved | Water | 9060A | |
| 680-191084-11 | SHM-93-22C-FAL20 | Dissolved | Water | 9060A | |
| 680-191084-12 | SHP-2016-3B-FAL20 | Dissolved | Water | 9060A | |
| MB 280-516757/4 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-516757/3 | Lab Control Sample | Dissolved | Water | 9060A | |
| 680-191084-1 MS | PZ-12-04-FAL20 | Dissolved | Water | 9060A | |
| 680-191084-1 MSD | PZ-12-04-FAL20 | Dissolved | Water | 9060A | |
| 680-191084-11 MS | SHM-93-22C-FAL20 | Dissolved | Water | 9060A | |
| 680-191084-11 MSD | SHM-93-22C-FAL20 | Dissolved | Water | 9060A | |

### Analysis Batch: 516826

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191084-2 | PZ-12-05-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191084-3 | PZ-12-06-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191084-10 | SHM-93-22B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191084-11 | SHM-93-22C-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191084-12 | SHP-2016-3B-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-516826/58 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-516826/57 | Lab Control Sample | Total/NA | Water | SM 2320B | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Client Sample ID: PZ-12-04-FAL20

**Lab Sample ID: 680-191084-1**
**Date Collected: 11/02/20 16:00**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643908 | 11/13/20 20:04 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642936 | 11/07/20 16:34 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 15:04 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642937 | 11/07/20 16:36 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 14:14 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516757 | 11/13/20 17:30 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516589 | 11/12/20 23:44 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: PZ-12-05-FAL20

**Lab Sample ID: 680-191084-2**
**Date Collected: 11/03/20 12:55**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643908 | 11/13/20 20:17 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642936 | 11/07/20 16:34 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 15:27 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642937 | 11/07/20 16:36 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 14:32 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516757 | 11/13/20 18:21 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516826 | 11/13/20 23:03 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: PZ-12-06-FAL20

**Lab Sample ID: 680-191084-3**
**Date Collected: 11/03/20 14:00**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643908 | 11/13/20 19:25 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642936 | 11/07/20 16:34 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 15:31 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642937 | 11/07/20 16:36 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 14:35 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Client Sample ID: PZ-12-06-FAL20

**Lab Sample ID: 680-191084-3**

**Date Collected: 11/03/20 14:00**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516757 | 11/13/20 18:55 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516826 | 11/13/20 23:08 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHL-12-FAL20

**Lab Sample ID: 680-191084-4**

**Date Collected: 11/02/20 15:45**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643908 | 11/13/20 20:30 | EKB | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642936 | 11/07/20 16:34 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 15:36 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642937 | 11/07/20 16:36 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 14:39 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516757 | 11/13/20 19:15 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516589 | 11/12/20 23:55 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHL-22-FAL20

**Lab Sample ID: 680-191084-5**

**Date Collected: 11/03/20 13:15**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643908 | 11/13/20 20:43 | EKB | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642936 | 11/07/20 16:34 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 15:50 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642937 | 11/07/20 16:36 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 14:50 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516757 | 11/13/20 19:32 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516589 | 11/13/20 00:02 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Client Sample ID: SHL-7-FAL20

**Lab Sample ID: 680-191084-6**
**Date Collected: 11/03/20 10:10**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643908 | 11/13/20 20:56 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642936 | 11/07/20 16:34 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 15:55 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642937 | 11/07/20 16:36 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 14:53 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516757 | 11/13/20 19:49 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516589 | 11/13/20 00:06 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHL-9-FAL20

**Lab Sample ID: 680-191084-7**
**Date Collected: 11/03/20 15:10**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643908 | 11/13/20 21:08 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642936 | 11/07/20 16:34 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 15:59 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642937 | 11/07/20 16:36 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 14:57 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516757 | 11/13/20 20:16 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516589 | 11/13/20 00:11 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHL-DUP07-FAL20

**Lab Sample ID: 680-191084-8**
**Date Collected: 11/03/20 13:20**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643908 | 11/13/20 21:21 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642936 | 11/07/20 16:34 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 16:04 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642937 | 11/07/20 16:36 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 15:00 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Client Sample ID: SHL-DUP07-FAL20

**Lab Sample ID: 680-191084-8**

**Date Collected: 11/03/20 13:20**
**Date Received: 11/05/20 09:30**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516757 | 11/13/20 21:14 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516589 | 11/13/20 00:19 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-11-02-FAL20

**Lab Sample ID: 680-191084-9**

**Date Collected: 11/03/20 14:50**
**Date Received: 11/05/20 09:30**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643908 | 11/13/20 21:34 | EKB | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642936 | 11/07/20 16:34 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 16:08 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642937 | 11/07/20 16:36 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 15:04 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516757 | 11/13/20 21:34 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516589 | 11/13/20 00:26 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: SHM-93-22B-FAL20

**Lab Sample ID: 680-191084-10**

**Date Collected: 11/03/20 10:50**
**Date Received: 11/05/20 09:30**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643908 | 11/13/20 21:47 | EKB | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642936 | 11/07/20 16:34 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 16:13 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642937 | 11/07/20 16:36 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 15:07 | BWR | TAL SAV |
| | Instrument ID: | ICPMSC | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516757 | 11/13/20 21:51 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516826 | 11/13/20 23:26 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Client Sample ID: SHM-93-22C-FAL20

**Lab Sample ID: 680-191084-11**

**Date Collected: 11/03/20 11:45**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643909 | 11/13/20 22:52 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642936 | 11/07/20 16:34 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 16:18 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642937 | 11/07/20 16:36 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 15:11 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516757 | 11/13/20 22:15 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516826 | 11/13/20 23:31 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: SHP-2016-3B-FAL20

**Lab Sample ID: 680-191084-12**

**Date Collected: 11/03/20 09:20**
**Matrix: Water**
**Date Received: 11/05/20 09:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643909 | 11/13/20 23:30 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642936 | 11/07/20 16:34 | BCB | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/10/20 16:22 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642937 | 11/07/20 16:36 | BCB | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643240 | 11/09/20 15:14 | BWR | TAL SAV |
| | Instrument ID: ICPMSC | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 516757 | 11/13/20 23:07 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516826 | 11/13/20 23:36 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

## Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| ANAB | Dept. of Defense ELAP | L2463 | 09-22-22 |

## Laboratory: Eurofins TestAmerica, Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| A2LA | Dept. of Defense ELAP | 2907.01 | 10-31-21 |

# Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191084-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060A | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | TAL SAV |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-191084-01 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init | A2320B (A) 46 | SW6010C/FLDFLT (B) 9 | SW6020A/FLDFLT (B) 9 | SW9056A (A) 5 | SW9060A/FLDFLT (B) 3 | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | PZ-12-02-FAL20 | WG | | | | X | X | X | X | X | PZ-12-02 | N1 | 24.00 | 34.00 | | |
| 20 | PZ-12-03-FAL20 | WG | | | | X | X | X | X | X | PZ-12-03 | N1 | 24.00 | 34.00 | | |
| 21 | PZ-12-04-FAL20 | WG | 11-2-20 | 1600 | DC | X | X | X | X | X | PZ-12-04 | N1 | 24.00 | 34.00 | | |
| 22 | PZ-12-05-FAL20 | WG | 11-3-20 | 1255 | DC | X | X | X | X | X | PZ-12-05 | N1 | 26.00 | 36.00 | | |
| 23 | PZ-12-06-FAL20 | WG | 11-3-20 | 1400 | DC | X | X | X | X | X | PZ-12-06 | N1 | 25.00 | 35.00 | | |
| 24 | PZ-12-07-FAL20 | WG | | | | X | X | X | X | X | PZ-12-07 | N1 | 20.00 | 30.00 | | |
| 25 | PZ-12-08-FAL20 | WG | | | | X | X | X | X | X | PZ-12-08 | N1 | 22.00 | 32.00 | | |
| 26 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | PZ-12-09 | MS1 | 20.00 | 30.00 | | |
| 27 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | PZ-12-09 | N1 | 20.00 | 30.00 | | |
| 28 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | PZ-12-09 | SD1 | 20.00 | 30.00 | | |
| 29 | PZ-12-10-FAL20 | WG | | | | X | X | X | X | X | PZ-12-10 | N1 | 20.00 | 30.00 | | |
| 30 | SHL-10-FAL20 | WG | | | | X | X | X | X | X | SHL-10 | N1 | 24.00 | 39.00 | | |
| 31 | SHL-11-FAL20 | WG | | | | X | X | X | X | X | SHL-11 | N1 | 12.00 | 27.00 | | |
| 32 | SHL-12-FAL20 | WG | 11-2-20 | 1545 | NB | X | X | X | X | X | SHL-12 | N1 | 15.00 | 30.00 | | |
| 33 | SHL-15-FAL20 | WG | | | | X | X | X | X | X | SHL-15 | N1 | 14.00 | 24.00 | | |
| 34 | SHL-19-FAL20 | WG | | | | X | X | X | X | X | SHL-19 | N1 | 20.00 | 30.00 | | |
| 35 | SHL-20-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | N1 | 39.00 | 49.00 | | |
| 36 | SHL-22-FAL20 | WG | 11/3/20 | 1315 | CR | X | X | X | X | X | SHL-22 | N1 | 105.00 | 115.00 | | |

**Relinquished by:** Diane Clippne
**Date** 11-3-20
**Time** 1500
**Received by:** SHL_eCOC
11/3/20 1500

Relinquished by:
**Date** 11/4/20
**Time** 1700
**Shipping Date:**
Received by Laboratory: TA
11-5-20 930
Condition:

3.5/3.8 1.8/2.1

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2, Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-191084-02 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 37 | SHL-23-FAL20 | WG | | | | X | X | X | X | X | SHL-23 | N1 | 23.00 | 33.00 | | |
| 38 | SHL-24-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | N1 | 110.00 | 120.00 | | |
| 39 | SHL-3-FAL20 | WG | | | | X | X | X | X | X | SHL-3 | N1 | 24.00 | 34.00 | | |
| 40 | SHL-4-FAL20 | WG | | | | X | X | X | X | X | SHL-4 | N1 | 3.00 | 13.00 | | |
| 41 | SHL-5-FAL20 | WG | | | | X | X | X | X | X | SHL-5 | N1 | 3.00 | 13.00 | | |
| 42 | SHL-7-FAL20 | WG | 11-3-20 | 1010 | NB | X | X | X | X | X | SHL-7 | N1 | 11.00 | 21.00 | | |
| 43 | SHL-8D-FAL20 | WG | | | | X | X | X | X | X | SHL-8D | N1 | 68.00 | 70.00 | | |
| 44 | SHL-8S-FAL20 | WG | | | | X | X | X | X | X | SHL-8S | N1 | 52.00 | 54.00 | | |
| 45 | SHL-9-FAL20 | WG | 11-3-20 | 1510 | CR | X | X | X | X | X | SHL-9 | N1 | 15.00 | 25.00 | | |
| 46 | SHL-DUP01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | FD1 | 25.00 | 35.00 | | |
| 47 | SHL-DUP02-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | FD1 | 39.00 | 49.00 | | |
| 48 | SHL-DUP03-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | FD1 | 25.00 | 35.00 | | |
| 49 | SHL-DUP04-FAL20 | WG | | | | X | X | X | X | X | SHP-01-38A | FD1 | 1.50 | 6.50 | | |
| 50 | SHL-DUP05-FAL20 | WG | | | | X | X | X | X | X | SHP-2016-07A | FD1 | 22.00 | 32.00 | | |
| 51 | SHL-DUP06-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | FD1 | 79.50 | 84.50 | | |
| 52 | SHL-DUP07-FAL20 | WG | 11-3-20 | 1320 | CR | X | X | X | X | X | SHL-22 | FD1 | 105.00 | 115.00 | | |
| 53 | SHL-DUP08-FAL20 | WG | | | | X | X | X | X | X | SHM-96-5B | FD1 | 80.00 | 90.00 | | |
| 53 | SHL-DUP09-FAL20 | WG | | | | X | X | X | X | X | SHL-24 | FD1 | 110.00 | 120.00 | | |

**Relinquished by:** Diane Chupgue
**Date**
**Time**
Received by: [signature] 11-3-20 1500
SHL_eCOC 11/3/20 1500

Relinquished by: [signature]
**Date** 11/4/20
**Time** 1700
**Shipping Date:**
Received by Laboratory: [signature] TA 11-5-20
Condition: 930

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-191084-03 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Analytical Test Method | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 69 | SHM-10-05A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-05A | N1 | 50.00 | 60.00 | | |
| 70 | SHM-10-06-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06 | N1 | 69.50 | 79.50 | | |
| 71 | SHM-10-06A-FAL20 | WG | | | | X | X | X | X | X | SHM-10-06A | N1 | 77.00 | 87.00 | | |
| 72 | SHM-10-07-FAL20 | WG | | | | X | X | X | X | X | SHM-10-07 | N1 | 40.00 | 50.00 | | |
| 73 | SHM-10-08-FAL20 | WG | | | | X | X | X | X | X | SHM-10-08 | N1 | 46.00 | 56.00 | | |
| 74 | SHM-10-10-FAL20 | WG | | | | X | X | X | X | X | SHM-10-10 | N1 | 56.00 | 66.00 | | |
| 75 | SHM-10-11-FAL20 | WG | | | | X | X | X | X | X | SHM-10-11 | N1 | 50.00 | 60.00 | | |
| 76 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | MS1 | 45.00 | 55.00 | | |
| 77 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | N1 | 45.00 | 55.00 | | |
| 78 | SHM-10-12-FAL20 | WG | | | | X | X | X | X | X | SHM-10-12 | SD1 | 45.00 | 55.00 | | |
| 79 | SHM-10-13-FAL20 | WG | | | | X | X | X | X | X | SHM-10-13 | N1 | 60.00 | 70.00 | | |
| 80 | SHM-10-14-FAL20 | WG | | | | X | X | X | X | X | SHM-10-14 | N1 | 60.00 | 80.00 | | |
| 81 | SHM-10-15-FAL20 | WG | | | | X | X | X | X | X | SHM-10-15 | N1 | 45.00 | 55.00 | | |
| 82 | SHM-10-16-FAL20 | WG | | | | X | X | X | X | X | SHM-10-16 | N1 | 75.00 | 85.00 | | |
| 83 | SHM-11-02-FAL20 | WG | 11-3-20 | 1450 | DC | X | X | X | X | X | SHM-11-02 | N1 | 52.00 | 66.00 | | |
| 84 | SHM-11-06-FAL20 | WG | | | | X | X | X | X | X | SHM-11-06 | N1 | 25.00 | 35.00 | | |
| 85 | SHM-13-01-FAL20 | WG | | | | X | X | X | X | X | SHM-13-01 | N1 | 39.00 | 49.00 | | |
| 86 | SHM-13-02-FAL20 | WG | | | | X | X | X | X | X | SHM-13-02 | N1 | 60.00 | 70.00 | | |

**Relinquished by:** Dave Chap
**Date** 11-3-20 1500
**Time**
Received by: [signature] 11/3/20 1500
SHL_eCOC

Relinquished by: [signature]
**Date** 11/4/20
**Time** 1700
**Shipping Date:** [signature] 11-5-20 930 TA
Received by Laboratory:
Condition:



11/17/2020

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-191084-04 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | | | | | | |
| 87 | SHM-13-03-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-03 | N1 | 42.00 | 52.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-04 | MS1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-04 | N1 | 20.00 | 30.00 | | |
| 88 | SHM-13-04-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-04 | SD1 | 20.00 | 30.00 | | |
| 89 | SHM-13-05-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-05 | N1 | 75.00 | 85.00 | | |
| 90 | SHM-13-06-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-06 | N1 | 36.00 | 46.00 | | |
| 91 | SHM-13-07-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-07 | N1 | 27.00 | 37.00 | | |
| 92 | SHM-13-08-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-08 | N1 | 55.00 | 65.00 | | |
| 93 | SHM-13-14D-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-14D | N1 | 45.00 | 55.00 | | |
| 94 | SHM-13-14S-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-14S | N1 | 5.00 | 15.00 | | |
| 95 | SHM-13-15-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-13-15 | N1 | 50.00 | 60.00 | | |
| 96 | SHM-93-10D-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-10D | N1 | 48.70 | 58.70 | | |
| 97 | SHM-93-18B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-18B | N1 | 78.50 | 88.50 | | |
| 98 | SHM-93-22B-FAL20 | WG | 11-3-20 | 1050 | CR | X | X | X | X | X | | | | | | SHM-93-22B | N1 | 82.30 | 92.30 | | |
| 99 | SHM-93-22C-FAL20 | WG | 11-3-20 | 1145 | CR | X | X | X | X | X | | | | | | SHM-93-22C | N1 | 124.30 | 134.30 | | |
| 100 | SHM-93-24A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-93-24A | N1 | 13.20 | 23.20 | | |
| 101 | SHM-96-5B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-96-5B | N1 | 80.00 | 90.00 | | |
| 102 | SHM-96-5C-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-96-5C | N1 | 50.00 | 60.00 | | |

**Relinquished by:** Diane Dupper
**Date** 11-3-20
**Time** 1500
Received by: 11/3/20 1500
SHL_eCOC

Relinquished by:
**Date** 11/4/20
**Time** 1700
**Shipping Date:**
Received by Laboratory: TA 930
Condition: 11-5-20

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

680-191084-05 Chain of Custody

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | | | | | | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | | | | | | |
| 103 | SHM-99-31A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-99-31A | N1 | 4.00 | 14.00 | | |
| 104 | SHM-99-31B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-99-31B | N1 | 50.00 | 60.00 | | |
| 105 | SHM-99-31C-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-99-31C | N1 | 68.00 | 78.00 | | |
| 106 | SHM-99-32X-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHM-99-32X | N1 | 72.00 | 82.00 | | |
| 107 | SHP-01-36X-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-01-36X | N1 | 3.00 | 8.00 | | |
| 108 | SHP-01-37X-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-01-37X | N1 | 1.00 | 6.00 | | |
| 109 | SHP-01-38A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-01-38A | N1 | 1.50 | 6.50 | | |
| 110 | SHP-2016-06A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-06A | N1 | 81.00 | 86.00 | | |
| 111 | SHP-2016-06B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-06B | N1 | 102.00 | 112.00 | | |
| 112 | SHP-2016-06C-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-06C | N1 | 123.00 | 133.00 | | |
| 113 | SHP-2016-07A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-07A | N1 | 22.00 | 32.00 | | |
| 114 | SHP-2016-07B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-07B | N1 | 70.00 | 80.00 | | |
| 115 | SHP-2016-1A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-1A | N1 | 13.00 | 23.00 | | |
| 116 | SHP-2016-1B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-1B | N1 | 75.00 | 85.00 | | |
| 117 | SHP-2016-2A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-2A | N1 | 20.00 | 25.00 | | |
| 118 | SHP-2016-2B-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-2B | N1 | 80.00 | 85.00 | | |
| 119 | SHP-2016-3A-FAL20 | WG | | | | X | X | X | X | X | | | | | | SHP-2016-3A | N1 | 20.00 | 25.00 | | |
| 120 | SHP-2016-3B-FAL20 | WG | 11-3-20 | 920 | CR | X | X | X | X | X | | | | | | SHP-2016-3B | N1 | 80.00 | 85.00 | | |

**Relinquished by:** Drew Chapone
**Date** 11-3-20
**Time** 1500
Received by: 11/3/20 1500
SHL_eCOC

Relinquished by:
**Date** 11/4/20
**Time** 1700
**Shipping Date:**
Received by Laboratory: 11-5-20 930 TA
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, Sudbury Annex, Fall 2020 |
| **Project Number: DEVNS-LTM** | POC: | |
| **WBS Code:** | Ship to: | |

**Comments:**
SW8081B (A) = Pesticides
SW9012B (A) = Cyanide

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 1 | 2x 1L amber glass bottles, Cool to <6degC |
| 6 | 1x 125mL, plastic, Cool < 6degC |
| 21 | 1x 2-1 Liter, amber, glass, Cool < 6degC |
| 29 | 3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC |
| 48 | 1x 250mL plastic, NaOH to pH >12; Cool < 6degC |

| | Sample ID | Matrix | Date | Time | Samp Init. | E410.4 - COD | SW8081B (A) | SW8082A - PCB ** | SW8260B - VOCs | SW9012B (A) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Event: Seres-Arcadis JV, Long Term Monitoring, Sudbury Annex, Fall 2020 | | | | | 6 | 21 | 1 | 29 | 48 | | | | | | |
| 1 | OHM-A7-08-FAL20 | WG | | | | X | X | X | X | X | OHM-A7-08 | N1 | 20.60 | 35.60 | | |
| 2 | SUD-A07-014-FAL20 | WG | 11-2-20 | 1000 | CR | X | X | X | X | X | SUD-A07-014 | N1 | 12.00 | 22.00 | | |
| 3 | SUD-A07-065-FAL20 | WG | | | | X | X | X | X | X | SUD-A07-065 | N1 | 4.50 | 9.50 | | |
| 4 | SUD-DUP01-FAL20 | WG | | | | X | X | X | X | X | SUDA7-19-01 | FD1 | 2.00 | 10.00 | | |
| 5 | SUDA7-19-01-FAL20 | WG | | | | X | X | X | X | X | SUDA7-19-01 | N1 | 2.00 | 10.00 | | |

**Turnaround Time: NA**

** Submitted today

680-191084-06 Chain of Custody

**Relinquished by:** Diane Chepga
**Date** 11-3-20
**Time** 1500
Received by: [signature] 11/3/20 1500
SUD_eCOC

Relinquished by: [signature]
**Date** 11/4/20
**Time** 1700
**Shipping Date:**
Received by Laboratory: [signature] TA
Condition: 11-5-20 930



11/17/2020

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-632114.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 2 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-191084-1 |
| Address: 4955 Yarrow Street, . | Due Date Requested: 11/17/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| PZ-12-04-FAL20 (680-191084-1) | 11/2/20 | 16:00 Eastern | | Water | | | X | X | 2 | |
| PZ-12-05-FAL20 (680-191084-2) | 11/3/20 | 12:55 Eastern | | Water | | | X | X | 2 | |
| PZ-12-06-FAL20 (680-191084-3) | 11/3/20 | 14:00 Eastern | | Water | | | X | X | 2 | |
| SHL-12-FAL20 (680-191084-4) | 11/2/20 | 15:45 Eastern | | Water | | | X | X | 2 | |
| SHL-22-FAL20 (680-191084-5) | 11/3/20 | 13:15 Eastern | | Water | | | X | X | 2 | |
| SHL-7-FAL20 (680-191084-6) | 11/3/20 | 10:10 Eastern | | Water | | | X | X | 2 | |
| SHL-9-FAL20 (680-191084-7) | 11/3/20 | 15:10 Eastern | | Water | | | X | X | 2 | |
| SHL-DUP07-FAL20 (680-191084-8) | 11/3/20 | 13:20 Eastern | | Water | | | X | X | 2 | |
| SHM-11-02-FAL20 (680-191084-9) | 11/3/20 | 14:50 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Relinquished by: DR | Date/Time: 11-5-2020/1540 | Company | Received by: | Date/Time: 11-6-20 1610 | Company ETA DEN |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| | | |
|---|---|---|
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 1.4, -0.3, IR11, RAF 11-6-20 |

Ver: 01/16/2019

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-632114.2 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 2 of 2 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-191084-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/17/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SHM-93-22B-FAL20 (680-191084-10) | 11/3/20 | 10:50 Eastern | | Water | | | X | X | 2 | |
| SHM-93-22C-FAL20 (680-191084-11) | 11/3/20 | 11:45 Eastern | | Water | | | X | X | 2 | |
| SHP-2016-3B-FAL20 (680-191084-12) | 11/3/20 | 09:20 Eastern | | Water | | | X | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | |
|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |

| | | | | | |
|---|---|---|---|---|---|
| Relinquished by: | Date/Time: 11-5-2020/1540 | Company | Received by: | Date/Time: 11-6-20 1010 | Company ETA-DEN |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| | | |
|---|---|---|
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 1.4, -0.3, IR 11, RDB 11-6-20 |

Ver: 01/16/2019

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191084-1

**Login Number: 191084**
**List Number: 1**
**Creator: Sims, Robert D**

**List Source: Eurofins TestAmerica, Savannah**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191084-1

**Login Number: 191084**
**List Number: 2**
**Creator: Paul, Ryan D**

**List Source: Eurofins TestAmerica, Denver**
**List Creation: 11/06/20 11:28 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

eurofins | Environment Testing America

# ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-191150-1
Client Project/Site: Fort Devens

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

*Authorized for release by:*
*11/20/2020 9:36:17 AM*

Kathryn Smith, Client Service Manager
(912)250-0275
Kathy.Smith@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

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*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

# Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191150-1

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| U | Undetected at the Limit of Detection. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| J | Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| U | Undetected at the Limit of Detection. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| B | Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank. |
| J | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U | Undetected at the Limit of Detection. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

# Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191150-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---|---|---|---|---|---|
| 680-191150-4 | EPA-PZ-2012-2A-FAL20 | Water | 11/05/20 11:15 | 11/06/20 09:50 | |
| 680-191150-5 | EPA-PZ-2012-2B-FAL20 | Water | 11/05/20 12:50 | 11/06/20 09:50 | |
| 680-191150-6 | PZ-12-07-FAL20 | Water | 11/05/20 13:20 | 11/06/20 09:50 | |
| 680-191150-7 | PZ-12-08-FAL20 | Water | 11/05/20 14:30 | 11/06/20 09:50 | |

## Job ID: 680-191150-1

**Laboratory: Eurofins TestAmerica, Savannah**

**Narrative**

# CASE NARRATIVE
# Client: Seres Engineering & Services LLC
# Project: Fort Devens

## Report Number: 680-191150-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

**RECEIPT**
The samples were received on 11/06/2020; the samples arrived in good condition, properly preserved and on ice. The temperature of the cooler at receipt was 4.2º C.

**METALS (ICP) - DISSOLVED**
Samples EPA-PZ-2012-2A-FAL20 (680-191150-4), EPA-PZ-2012-2B-FAL20 (680-191150-5), PZ-12-07-FAL20 (680-191150-6) and PZ-12-08-FAL20 (680-191150-7) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/08/2020 and analyzed on 11/11/2020.

Manganese recovered he MS/MSD sample EPA-PZ-2012-2B-FAL20 (680-191150-5) in batch 680-643527.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**METALS (ICPMS) - DISSOLVED**
Samples EPA-PZ-2012-2A-FAL20 (680-191150-4), EPA-PZ-2012-2B-FAL20 (680-191150-5), PZ-12-07-FAL20 (680-191150-6) and PZ-12-08-FAL20 (680-191150-7) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 11/08/2020 and analyzed on 11/09/2020.

Arsenic recovered high for the MSD of sample EPA-PZ-2012-2B-FAL20MSD (680-191150-5) in batch 680-643244.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ALKALINITY**
Samples EPA-PZ-2012-2A-FAL20 (680-191150-4), EPA-PZ-2012-2B-FAL20 (680-191150-5), PZ-12-07-FAL20 (680-191150-6) and PZ-12-08-FAL20 (680-191150-7) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 11/16/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS BY ION CHROMATOGRAPHY (28 DAY)**
Samples EPA-PZ-2012-2A-FAL20 (680-191150-4), EPA-PZ-2012-2B-FAL20 (680-191150-5), PZ-12-07-FAL20 (680-191150-6) and PZ-12-08-FAL20 (680-191150-7) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 11/13/2020 and 11/14/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL ORGANIC CARBON (TOC)**
Samples EPA-PZ-2012-2A-FAL20 (680-191150-4), EPA-PZ-2012-2B-FAL20 (680-191150-5), PZ-12-07-FAL20 (680-191150-6) and PZ-12-08-FAL20 (680-191150-7) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 11/18/2020.

Dissolved Organic Carbon was detected in method blank MB 280-517348/70 at a level that was above the method detection limit but

## Job ID: 680-191150-1 (Continued)

### Laboratory: Eurofins TestAmerica, Savannah (Continued)

below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191150-1

## Client Sample ID: EPA-PZ-2012-2A-FAL20

**Lab Sample ID: 680-191150-4**
**Date Collected: 11/05/20 11:15**
**Matrix: Water**
**Date Received: 11/06/20 09:50**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 6.9 | | 0.50 | 0.20 | mg/L | | | 11/13/20 23:56 | 1 |
| Sulfate | 6.2 | | 1.0 | 0.40 | mg/L | | | 11/13/20 23:56 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 27 | J | 50 | 17 | ug/L | | 11/08/20 11:47 | 11/11/20 09:04 | 1 |
| Manganese | 1.5 | J | 10 | 1.0 | ug/L | | 11/08/20 11:47 | 11/11/20 09:04 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/08/20 11:47 | 11/09/20 18:49 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 13 | | 10 | 3.1 | mg/L | | | 11/16/20 19:33 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.74 | J | 1.0 | 0.35 | mg/L | | | 11/18/20 12:00 | 1 |

## Client Sample ID: EPA-PZ-2012-2B-FAL20

**Lab Sample ID: 680-191150-5**
**Date Collected: 11/05/20 12:50**
**Matrix: Water**
**Date Received: 11/06/20 09:50**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 45 | | 0.50 | 0.20 | mg/L | | | 11/14/20 00:09 | 1 |
| Sulfate | 10 | | 1.0 | 0.40 | mg/L | | | 11/14/20 00:09 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 4300 | | 50 | 17 | ug/L | | 11/08/20 11:47 | 11/11/20 08:17 | 1 |
| Manganese | 6000 | J | 10 | 1.0 | ug/L | | 11/08/20 11:47 | 11/11/20 08:17 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U J | 3.0 | 1.5 | ug/L | | 11/08/20 11:47 | 11/09/20 18:17 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 130 | | 10 | 3.1 | mg/L | | | 11/16/20 19:39 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.4 | | 1.0 | 0.35 | mg/L | | | 11/18/20 12:19 | 1 |

# Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191150-1

## Client Sample ID: PZ-12-07-FAL20

**Lab Sample ID: 680-191150-6**

**Date Collected: 11/05/20 13:20**
**Date Received: 11/06/20 09:50**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.2 | | 0.50 | 0.20 | mg/L | | | 11/14/20 00:22 | 1 |
| Sulfate | 50 | | 1.0 | 0.40 | mg/L | | | 11/14/20 00:22 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 3800 | | 50 | 17 | ug/L | | 11/08/20 11:47 | 11/11/20 08:59 | 1 |
| Manganese | 1100 | | 10 | 1.0 | ug/L | | 11/08/20 11:47 | 11/11/20 08:59 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 110 | | 3.0 | 1.5 | ug/L | | 11/08/20 11:47 | 11/09/20 18:39 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 87 | | 10 | 3.1 | mg/L | | | 11/16/20 19:44 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.4 | | 1.0 | 0.35 | mg/L | | | 11/18/20 12:33 | 1 |

## Client Sample ID: PZ-12-08-FAL20

**Lab Sample ID: 680-191150-7**

**Date Collected: 11/05/20 14:30**
**Date Received: 11/06/20 09:50**

**Matrix: Water**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1.1 | | 0.50 | 0.20 | mg/L | | | 11/14/20 00:35 | 1 |
| Sulfate | 8.8 | | 1.0 | 0.40 | mg/L | | | 11/14/20 00:35 | 1 |

### Method: 6010C - Metals (ICP) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17000 | | 50 | 17 | ug/L | | 11/08/20 11:47 | 11/11/20 09:09 | 1 |
| Manganese | 1700 | | 10 | 1.0 | ug/L | | 11/08/20 11:47 | 11/11/20 09:09 | 1 |

### Method: 6020A - Metals (ICP/MS) - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 24 | | 3.0 | 1.5 | ug/L | | 11/08/20 11:47 | 11/09/20 18:52 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 85 | | 10 | 3.1 | mg/L | | | 11/16/20 19:49 | 1 |

### General Chemistry - Dissolved

| Analyte | Result | Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 1.7 | B | 1.0 | 0.35 | mg/L | | | 11/18/20 17:15 | 1 |

# QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191150-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 680-643909/33**
**Matrix: Water**
**Analysis Batch: 643909**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.20 | U | 0.50 | 0.20 | mg/L | | | 11/13/20 22:13 | 1 |
| Sulfate | 0.40 | U | 1.0 | 0.40 | mg/L | | | 11/13/20 22:13 | 1 |

**Lab Sample ID: LCS 680-643909/34**
**Matrix: Water**
**Analysis Batch: 643909**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.5 | | mg/L | | 105 | 87 - 111 |
| Sulfate | 10.0 | 10.3 | | mg/L | | 103 | 87 - 112 |

**Lab Sample ID: LCSD 680-643909/35**
**Matrix: Water**
**Analysis Batch: 643909**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 10.5 | | mg/L | | 105 | 87 - 111 | 0 | 15 |
| Sulfate | 10.0 | 10.4 | | mg/L | | 104 | 87 - 112 | 1 | 15 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-642976/1-A**
**Matrix: Water**
**Analysis Batch: 643527**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 642976**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 17 | U | 50 | 17 | ug/L | | 11/08/20 11:47 | 11/11/20 08:08 | 1 |
| Manganese | 1.0 | U | 10 | 1.0 | ug/L | | 11/08/20 11:47 | 11/11/20 08:08 | 1 |

**Lab Sample ID: LCS 680-642976/2-A**
**Matrix: Water**
**Analysis Batch: 643527**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 642976**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 5000 | 4940 | | ug/L | | 99 | 87 - 115 |
| Manganese | 400 | 399 | | ug/L | | 100 | 90 - 114 |

**Lab Sample ID: 680-191150-5 MS**
**Matrix: Water**
**Analysis Batch: 643527**

**Client Sample ID: EPA-PZ-2012-2B-FAL20**
**Prep Type: Dissolved**
**Prep Batch: 642976**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 4300 | | 5000 | 9140 | | ug/L | | 97 | 87 - 115 |
| Manganese | 6000 | J | 400 | 6240 | 4 | ug/L | | 53 | 90 - 114 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 680-191150-5 MSD** — **Client Sample ID: EPA-PZ-2012-2B-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643527** — **Prep Batch: 642976**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 4300 | | 5000 | 9250 | | ug/L | | 99 | 87 - 115 | 1 | 20 |
| Manganese | 6000 | J | 400 | 6260 | 4 | ug/L | | 58 | 90 - 114 | 0 | 20 |

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 680-642975/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 643244** — **Prep Batch: 642975**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U | 3.0 | 1.5 | ug/L | | 11/08/20 11:47 | 11/09/20 18:11 | 1 |

**Lab Sample ID: LCS 680-642975/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 643244** — **Prep Batch: 642975**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 90.8 | | ug/L | | 91 | 84 - 116 |

**Lab Sample ID: 680-191150-5 MS** — **Client Sample ID: EPA-PZ-2012-2B-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643244** — **Prep Batch: 642975**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U J | 100 | 103 | | ug/L | | 103 | 84 - 116 |

**Lab Sample ID: 680-191150-5 MSD** — **Client Sample ID: EPA-PZ-2012-2B-FAL20**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 643244** — **Prep Batch: 642975**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.5 | U J | 100 | 122 | J | ug/L | | 122 | 84 - 116 | 17 | 20 |

## Method: 9060A - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 280-517198/34** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517198**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.35 | U | 1.0 | 0.35 | mg/L | | | 11/18/20 04:29 | 1 |

**Lab Sample ID: LCS 280-517198/33** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Dissolved**
**Analysis Batch: 517198**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 24.3 | | mg/L | | 97 | 88 - 112 |

## Method: 9060A - Organic Carbon, Dissolved (DOC) (Continued)

**Lab Sample ID: MB 280-517348/70**
**Matrix: Water**
**Analysis Batch: 517348**

**Client Sample ID: Method Blank**
**Prep Type: Dissolved**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 0.621 | J | 1.0 | 0.35 | mg/L | | | 11/18/20 17:48 | 1 |

**Lab Sample ID: LCS 280-517348/69**
**Matrix: Water**
**Analysis Batch: 517348**

**Client Sample ID: Lab Control Sample**
**Prep Type: Dissolved**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Dissolved Organic Carbon | 25.0 | 24.4 | | mg/L | | 98 | 88 - 112 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-516966/58**
**Matrix: Water**
**Analysis Batch: 516966**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | LOQ | DL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 3.1 | U | 10 | 3.1 | mg/L | | | 11/16/20 19:13 | 1 |

**Lab Sample ID: LCS 280-516966/57**
**Matrix: Water**
**Analysis Batch: 516966**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 207 | | mg/L | | 104 | 89 - 109 |

**Lab Sample ID: LCSD 280-516966/5**
**Matrix: Water**
**Analysis Batch: 516966**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity | 200 | 210 | | mg/L | | 105 | 89 - 109 | 9 | 10 |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191150-1

## HPLC/IC

### Analysis Batch: 643909

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191150-4 | EPA-PZ-2012-2A-FAL20 | Total/NA | Water | 9056A | |
| 680-191150-5 | EPA-PZ-2012-2B-FAL20 | Total/NA | Water | 9056A | |
| 680-191150-6 | PZ-12-07-FAL20 | Total/NA | Water | 9056A | |
| 680-191150-7 | PZ-12-08-FAL20 | Total/NA | Water | 9056A | |
| MB 680-643909/33 | Method Blank | Total/NA | Water | 9056A | |
| LCS 680-643909/34 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 680-643909/35 | Lab Control Sample Dup | Total/NA | Water | 9056A | |

## Metals

### Prep Batch: 642975

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191150-4 | EPA-PZ-2012-2A-FAL20 | Dissolved | Water | 3005A | |
| 680-191150-5 | EPA-PZ-2012-2B-FAL20 | Dissolved | Water | 3005A | |
| 680-191150-6 | PZ-12-07-FAL20 | Dissolved | Water | 3005A | |
| 680-191150-7 | PZ-12-08-FAL20 | Dissolved | Water | 3005A | |
| MB 680-642975/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-642975/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191150-5 MS | EPA-PZ-2012-2B-FAL20 | Dissolved | Water | 3005A | |
| 680-191150-5 MSD | EPA-PZ-2012-2B-FAL20 | Dissolved | Water | 3005A | |

### Prep Batch: 642976

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191150-4 | EPA-PZ-2012-2A-FAL20 | Dissolved | Water | 3005A | |
| 680-191150-5 | EPA-PZ-2012-2B-FAL20 | Dissolved | Water | 3005A | |
| 680-191150-6 | PZ-12-07-FAL20 | Dissolved | Water | 3005A | |
| 680-191150-7 | PZ-12-08-FAL20 | Dissolved | Water | 3005A | |
| MB 680-642976/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 680-642976/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 680-191150-5 MS | EPA-PZ-2012-2B-FAL20 | Dissolved | Water | 3005A | |
| 680-191150-5 MSD | EPA-PZ-2012-2B-FAL20 | Dissolved | Water | 3005A | |

### Analysis Batch: 643244

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191150-4 | EPA-PZ-2012-2A-FAL20 | Dissolved | Water | 6020A | 642975 |
| 680-191150-5 | EPA-PZ-2012-2B-FAL20 | Dissolved | Water | 6020A | 642975 |
| 680-191150-6 | PZ-12-07-FAL20 | Dissolved | Water | 6020A | 642975 |
| 680-191150-7 | PZ-12-08-FAL20 | Dissolved | Water | 6020A | 642975 |
| MB 680-642975/1-A | Method Blank | Total Recoverable | Water | 6020A | 642975 |
| LCS 680-642975/2-A | Lab Control Sample | Total Recoverable | Water | 6020A | 642975 |
| 680-191150-5 MS | EPA-PZ-2012-2B-FAL20 | Dissolved | Water | 6020A | 642975 |
| 680-191150-5 MSD | EPA-PZ-2012-2B-FAL20 | Dissolved | Water | 6020A | 642975 |

### Analysis Batch: 643527

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191150-4 | EPA-PZ-2012-2A-FAL20 | Dissolved | Water | 6010C | 642976 |
| 680-191150-5 | EPA-PZ-2012-2B-FAL20 | Dissolved | Water | 6010C | 642976 |
| 680-191150-6 | PZ-12-07-FAL20 | Dissolved | Water | 6010C | 642976 |
| 680-191150-7 | PZ-12-08-FAL20 | Dissolved | Water | 6010C | 642976 |
| MB 680-642976/1-A | Method Blank | Total Recoverable | Water | 6010C | 642976 |
| LCS 680-642976/2-A | Lab Control Sample | Total Recoverable | Water | 6010C | 642976 |

# QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191150-1

## Metals (Continued)

### Analysis Batch: 643527 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191150-5 MS | EPA-PZ-2012-2B-FAL20 | Dissolved | Water | 6010C | 642976 |
| 680-191150-5 MSD | EPA-PZ-2012-2B-FAL20 | Dissolved | Water | 6010C | 642976 |

## General Chemistry

### Analysis Batch: 516966

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191150-4 | EPA-PZ-2012-2A-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191150-5 | EPA-PZ-2012-2B-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191150-6 | PZ-12-07-FAL20 | Total/NA | Water | SM 2320B | |
| 680-191150-7 | PZ-12-08-FAL20 | Total/NA | Water | SM 2320B | |
| MB 280-516966/58 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-516966/57 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| LCSD 280-516966/5 | Lab Control Sample Dup | Total/NA | Water | SM 2320B | |

### Analysis Batch: 517198

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191150-4 | EPA-PZ-2012-2A-FAL20 | Dissolved | Water | 9060A | |
| 680-191150-5 | EPA-PZ-2012-2B-FAL20 | Dissolved | Water | 9060A | |
| 680-191150-6 | PZ-12-07-FAL20 | Dissolved | Water | 9060A | |
| MB 280-517198/34 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-517198/33 | Lab Control Sample | Dissolved | Water | 9060A | |

### Analysis Batch: 517348

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 680-191150-7 | PZ-12-08-FAL20 | Dissolved | Water | 9060A | |
| MB 280-517348/70 | Method Blank | Dissolved | Water | 9060A | |
| LCS 280-517348/69 | Lab Control Sample | Dissolved | Water | 9060A | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191150-1

## Client Sample ID: EPA-PZ-2012-2A-FAL20

**Lab Sample ID: 680-191150-4**
**Date Collected: 11/05/20 11:15**
**Matrix: Water**
**Date Received: 11/06/20 09:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643909 | 11/13/20 23:56 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642976 | 11/08/20 11:47 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/11/20 09:04 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642975 | 11/08/20 11:47 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643244 | 11/09/20 18:49 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 12:00 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 19:33 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: EPA-PZ-2012-2B-FAL20

**Lab Sample ID: 680-191150-5**
**Date Collected: 11/05/20 12:50**
**Matrix: Water**
**Date Received: 11/06/20 09:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643909 | 11/14/20 00:09 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642976 | 11/08/20 11:47 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/11/20 08:17 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642975 | 11/08/20 11:47 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643244 | 11/09/20 18:17 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 12:19 | JMB | TAL DEN |
| | Instrument ID: WC_SHI3 | | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 19:39 | RAF | TAL DEN |
| | Instrument ID: WC_AT4 | | | | | | | | | |

## Client Sample ID: PZ-12-07-FAL20

**Lab Sample ID: 680-191150-6**
**Date Collected: 11/05/20 13:20**
**Matrix: Water**
**Date Received: 11/06/20 09:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643909 | 11/14/20 00:22 | EKB | TAL SAV |
| | Instrument ID: CICH | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642976 | 11/08/20 11:47 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/11/20 08:59 | BCB | TAL SAV |
| | Instrument ID: ICPE | | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642975 | 11/08/20 11:47 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643244 | 11/09/20 18:39 | BJB | TAL SAV |
| | Instrument ID: ICPMSD | | | | | | | | | |

# Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191150-1

## Client Sample ID: PZ-12-07-FAL20

**Lab Sample ID: 680-191150-6**

**Date Collected: 11/05/20 13:20**
**Matrix: Water**
**Date Received: 11/06/20 09:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517198 | 11/18/20 12:33 | JMB | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 19:44 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

## Client Sample ID: PZ-12-08-FAL20

**Lab Sample ID: 680-191150-7**

**Date Collected: 11/05/20 14:30**
**Matrix: Water**
**Date Received: 11/06/20 09:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 643909 | 11/14/20 00:35 | EKB | TAL SAV |
| | Instrument ID: | CICH | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 50 mL | 642976 | 11/08/20 11:47 | AJR | TAL SAV |
| Dissolved | Analysis | 6010C | | 1 | | | 643527 | 11/11/20 09:09 | BCB | TAL SAV |
| | Instrument ID: | ICPE | | | | | | | | |
| Dissolved | Prep | 3005A | | | 50 mL | 250 mL | 642975 | 11/08/20 11:47 | AJR | TAL SAV |
| Dissolved | Analysis | 6020A | | 1 | | | 643244 | 11/09/20 18:52 | BJB | TAL SAV |
| | Instrument ID: | ICPMSD | | | | | | | | |
| Dissolved | Analysis | 9060A | | 1 | 20 mL | 20 mL | 517348 | 11/18/20 17:15 | JMB | TAL DEN |
| | Instrument ID: | WC_SHI3 | | | | | | | | |
| Total/NA | Analysis | SM 2320B | | 1 | | | 516966 | 11/16/20 19:49 | RAF | TAL DEN |
| | Instrument ID: | WC_AT4 | | | | | | | | |

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191150-1

## Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| ANAB | Dept. of Defense ELAP | L2463 | 09-22-22 |

## Laboratory: Eurofins TestAmerica, Denver

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | Identification Number | Expiration Date |
|---|---|---|---|
| A2LA | Dept. of Defense ELAP | 2907.01 | 10-31-21 |

# Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens

Job ID: 680-191150-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL SAV |
| 6010C | Metals (ICP) | SW846 | TAL SAV |
| 6020A | Metals (ICP/MS) | SW846 | TAL SAV |
| 9060A | Organic Carbon, Dissolved (DOC) | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | TAL SAV |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, AOC 50, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
E353.2 (A) = Nitrite Nitrate as N
RSK175 (A) = Dissolved Gases
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9034 (A) = Sulfide

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 5 | 1x 125mL plastic, Cool < 6degC |
| 7 | 2x 250mL plastic, ZnAc/NaOH Cool < 6degC |
| 8 | 3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 10 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 29 | 3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |
| 47 | 1x 500mL, amber glass, H2SO4; Cool < 6degC |

680-191150-01 Chain of Custody

ston
:215

Event: Seres-Arcadis JV, Long Term Monitoring, AOC 50, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | E353.2 (A) | RSK175 (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW8260B - VOCs | SW9034 (A) | SW9056A - SO4 | SW9060A - TOC | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 47 | 8 | 9 | 9 | 29 | 7 | 5 | 10 | | | | | | |
| 39 | G6M-13-03X-FAL20 | WG | | | | | | | X | X | X | | | | G6M-13-03X | N1 | 80.00 | 90.00 | | |
| 40 | G6M-13-04X-FAL20 | WG | | | | X | X | X | X | X | X | X | X | X | G6M-13-04X | N1 | 125.00 | 135.00 | | |
| 41 | G6M-13-05X-FAL20 | WG | | | | X | X | X | X | X | X | X | X | X | G6M-13-05X | N1 | 45.00 | 55.00 | | |
| 42 | G6M-13-06X-FAL20 | WG | | | | X | X | X | X | X | X | X | X | X | G6M-13-06X | N1 | 50.00 | 60.00 | | |
| 43 | G6M-18-01-FAL20 | WG | 11-5-20 | 1035 | DC | X | X | X | X | X | X | X | X | X | G6M-18-01 | N1 | 116.00 | 126.00 | | |
| 44 | G6M-18-02-FAL20 | WG | | | | X | X | X | X | X | X | X | X | X | G6M-18-02 | N1 | 123.95 | 133.95 | | |
| 45 | G6M-95-19X-FAL20 | WG | | | | | | | | | X | | | | G6M-95-19X | N1 | 48.00 | 58.00 | | |
| 46 | G6M-95-20X-FAL20 | WG | | | | | | | X | X | X | | | | G6M-95-20X | N1 | 18.00 | 23.00 | | |
| 47 | G6M-97-05B-FAL20 | WG | | | | X | X | X | X | X | X | X | X | X | G6M-97-05B | N1 | 130.00 | 135.00 | | |
| 48 | G6M-97-28X-FAL20 | WG | | | | | | | X | X | X | | | | G6M-97-28X | N1 | 100.00 | 105.00 | | |
| 49 | ~~MW-3-FAL20~~ RB-AOC50 | WG | 11-5-20 | 1120 | DC | | | | X | X | X | | | | ~~MW-3~~ | ~~MS1~~ | ~~126.00~~ | ~~137.00~~ | | |
| 50 | MW-3-FAL20 FAL20 | WG | | | | | | | X | X | X | | | | MW-3 | N1 | 126.00 | 137.00 | | |
| 51 | MW-3-FAL20 | WG | | | | | | | X | X | X | | | | MW-3 | SD1 | 126.00 | 137.00 | | |
| 52 | MW-7-FAL20 | WG | | | | | | | X | X | X | | | | MW-7 | N1 | 6.58 | 135.00 | | |
| 53 | XSA-12-95X-FAL20 | WG | | | | | | | X | X | X | | | | XSA-12-95X | N1 | 120.00 | 130.00 | | |
| 54 | XSA-12-96X-FAL20 | WG | | | | X | X | X | X | X | X | X | X | X | XSA-12-96X | N1 | 120.00 | 130.00 | | |
| 55 | XSA-12-97X-FAL20 | WG | | | | | | | X | X | X | | | | XSA-12-97X | N1 | 120.00 | 130.00 | | |
| 56 | XSA-12-98X-FAL20 | WG | | | | | | | X | X | X | | | | XSA-12-98X | N1 | 60.00 | 70.00 | | |

**Turnaround Time: NA**

**Relinquished by:** Diane Chapgue
**Date** 11-5-20
**Time** 1500
Received by: 11/5/20 1500
Copy of AOC50_eCOC

**Date**
**Time** 11/5/20 1700
**Shipping Date:** 3.9/9.2
Received by Laboratory: 11-6-20 950
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC #

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, AOC 50, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
E353.2 (A) = Nitrite Nitrate as N
RSK175 (A) = Dissolved Gases
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9034 (A) = Sulfide

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 5 | 1x 125mL plastic, Cool < 6degC |
| 7 | 2x 250mL plastic, ZnAc/NaOH Cool < 6degC |
| 8 | 3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 10 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 29 | 3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |
| 47 | 1x 500mL, amber glass, H2SO4; Cool < 6degC |

Boston #215

Event: Seres-Arcadis JV, Long Term Monitoring, AOC 50, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | E353.2 (A) | RSK175 (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW8260B - VOCs | SW9034 (A) | SW9056A - SO4 | SW9060A - TOC | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 47 | 8 | 9 | 9 | 29 | 7 | 5 | 10 | | | | | | |
| 20 | G6M-04-03X-FAL20 | WG | | | | X | X | X | X | X | X | X | X | X | G6M-04-03X | SD1 | 85.00 | 95.00 | | |
| 21 | G6M-04-04X-FAL20 | WG | | | | | | | X | X | X | | | | G6M-04-04X | N1 | 94.00 | 104.00 | | |
| 22 | G6M-04-05X-FAL20 | WG | | | | | | | | | X | | | | G6M-04-05X | N1 | 100.00 | 110.00 | | |
| 23 | G6M-04-06X-FAL20 | WG | | | | | | | X | X | X | | | | G6M-04-06X | N1 | 95.00 | 136.00 | | |
| 24 | G6M-04-07X-FAL20 | WG | | | | X | X | X | X | X | X | X | X | X | G6M-04-07X | N1 | 120.00 | 130.00 | | |
| 25 | G6M-04-09X-FAL20 | WG | | | | | | | X | X | X | | | | G6M-04-09X | N1 | 55.00 | 65.00 | | |
| 26 | G6M-04-10A-FAL20 | WG | | | | X | X | X | X | X | X | X | X | X | G6M-04-10A | N1 | 30.00 | 40.00 | | |
| 27 | G6M-04-10X-FAL20 | WG | | | | | | | | | X | | | | G6M-04-10X | N1 | 52.00 | 62.00 | | |
| 28 | G6M-04-11X-FAL20 | WG | | | | | | | X | X | X | | | | G6M-04-11X | N1 | 35.00 | 45.00 | | |
| 29 | G6M-04-13X-FAL20 | WG | | | | | | | | | X | | | | G6M-04-13X | N1 | 30.00 | 40.00 | | |
| 30 | G6M-04-14X-FAL20 | WG | | | | | | | X | X | X | | | | G6M-04-14X | N1 | 80.00 | 90.00 | | |
| 31 | G6M-04-15X-FAL20 | WG | | | | | | | X | X | X | | | | G6M-04-15X | N1 | 70.00 | 80.00 | | |
| 32 | G6M-04-22X-FAL20 | WG | | | | | | | X | X | X | | | | G6M-04-22X | N1 | 74.00 | 84.00 | | |
| 33 | G6M-04-31X-FAL20 | WG | | | | | | | X | X | X | | | | G6M-04-31X | N1 | 68.00 | 78.00 | | |
| 34 | G6M-06-01X-FAL20 | WG | 11-5-20 | 1115 | NB | | | | X | X | X | | | | G6M-06-01X | N1 | 106.00 | 126.00 | | |
| 35 | G6M-07-01X-FAL20 | WG | | | | X | X | X | X | X | X | X | X | X | G6M-07-01X | N1 | 78.00 | 89.00 | | |
| 36 | G6M-07-02X-FAL20 | WG | | | | X | X | X | X | X | X | X | X | X | G6M-07-02X | N1 | 22.50 | 27.50 | | |
| 37 | G6M-13-01X-FAL20 | WG | | | | X | X | X | X | X | X | X | X | X | G6M-13-01X | N1 | 125.00 | 135.00 | | |
| 38 | G6M-13-02X-FAL20 | WG | | | | X | X | X | X | X | X | X | X | X | G6M-13-02X | N1 | 115.00 | 125.00 | | |

680-191150-02 Chain of Custody

**Relinquished by:** Diane Chupsue (1) Trip Blank AOC50-FAL20
**Date** 11-5-20
**Time** 1500
Received by: 11/5/20 1500
Copy of AOC50_eCOC

**Date**
**Time**
**Shipping Date:**
Received by Laboratory: 11/5/20 1500
Condition:

DM TA
11-6-20 950

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Boston #215

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Analytical Test Method | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 1 | EPA-PZ-2012-1A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-1A | N1 | 23.70 | 28.70 | | |
| 2 | EPA-PZ-2012-1B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-1B | N1 | 73.56 | 78.56 | | |
| 3 | EPA-PZ-2012-2A-FAL20 | WG | 11-5-20 | 1115 | CR | X | X | X | X | X | EPA-PZ-2012-2A | N1 | 18.14 | 23.14 | | |
| 4 | EPA-PZ-2012-2B-FAL20 | WG | 11-5-20 | 1250 | CR | X | X | X | X | X | EPA-PZ-2012-2B | N1 | 73.16 | 78.16 | | |
| 5 | EPA-PZ-2012-3A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-3A | N1 | 19.09 | 24.09 | | |
| 6 | EPA-PZ-2012-3B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-3B | N1 | 68.70 | 73.70 | | |
| 7 | EPA-PZ-2012-4A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4A | N1 | 19.56 | 24.56 | | |
| 8 | EPA-PZ-2012-4B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-4B | N1 | 79.50 | 84.50 | | |
| 9 | EPA-PZ-2012-5A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-5A | N1 | 17.95 | 22.95 | | |
| 10 | EPA-PZ-2012-5B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-5B | N1 | 68.46 | 73.46 | | |
| 11 | EPA-PZ-2012-6A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-6A | N1 | 24.19 | 29.19 | | |
| 12 | EPA-PZ-2012-6B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-6B | N1 | 74.23 | 79.23 | | |
| 13 | EPA-PZ-2012-7A-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-7A | N1 | 23.87 | 28.87 | | |
| 14 | EPA-PZ-2012-7B-FAL20 | WG | | | | X | X | X | X | X | EPA-PZ-2012-7B | N1 | 58.82 | 63.82 | | |
| 15 | EW-01-FAL20 | WG | | | | X | X | X | X | X | EW-01 | N1 | 60.00 | 85.00 | | |
| 16 | EW-04-FAL20 | WG | | | | X | X | X | X | X | EW-04 | N1 | 70.00 | 95.00 | | |
| 17 | N5-P1-FAL20 | WG | | | | X | X | X | X | X | N5-P1 | N1 | 95.50 | 97.50 | | |
| 18 | PZ-12-01-FAL20 | WG | | | | X | X | X | X | X | PZ-12-01 | N1 | 24.00 | 34.00 | | |

680-191150-03 Chain of Custody

**Relinquished by:** Diane Chapgue
**Date** 11-5-20
**Time** 1500
Received by: 15:00 11/5/20
SHL_eCOC

**Date**
**Time**
**Shipping Date:** 11/5/20 12:10
Received by Laboratory: TA 11-6 20 950
Condition:

# CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

**COC #**

| | | |
|---|---|---|
| **Project Name: Former Fort Devens, Long Term Monitoring** | Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA | Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| **Project Number: DEVENS-LTM** | Contact: | |
| **WBS Code:** | Ship to: | |

**Comments:**
A2320B (A) = Alkalinity
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 3 | 1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC |
| 5 | 1x 125mL plastic, Cool < 6degC |
| 9 | 1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC |
| 46 | 1x 250mL, plastic, Cool < 6degC |

Boston #215

Event: Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020

| | Sample ID | Matrix | Date | Time | Samp Init. | A2320B (A) | SW6010C/FLDFLT (B) | SW6020A/FLDFLT (B) | SW9056A (A) | SW9060A/FLDFLT (B) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 46 | 9 | 9 | 5 | 3 | | | | | | |
| 19 | PZ-12-02-FAL20 | WG | | | | X | X | X | X | X | PZ-12-02 | N1 | 24.00 | 34.00 | | |
| 20 | PZ-12-03-FAL20 | WG | | | | X | X | X | X | X | PZ-12-03 | N1 | 24.00 | 34.00 | | |
| 21 | PZ-12-04-FAL20 | WG | | | | X | X | X | X | X | PZ-12-04 | N1 | 24.00 | 34.00 | | |
| 22 | PZ-12-05-FAL20 | WG | | | | X | X | X | X | X | PZ-12-05 | N1 | 26.00 | 36.00 | | |
| 23 | PZ-12-06-FAL20 | WG | | | | X | X | X | X | X | PZ-12-06 | N1 | 25.00 | 35.00 | | |
| 24 | PZ-12-07-FAL20 | WG | 11-5-20 | 1320 | DC | X | X | X | X | X | PZ-12-07 | N1 | 20.00 | 30.00 | | |
| 25 | PZ-12-08-FAL20 | WG | 11-5-20 | 1430 | DC | X | X | X | X | X | PZ-12-08 | N1 | 22.00 | 32.00 | | |
| 26 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | PZ-12-09 | MS1 | 20.00 | 30.00 | | |
| 27 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | PZ-12-09 | N1 | 20.00 | 30.00 | | |
| 28 | PZ-12-09-FAL20 | WG | | | | X | X | X | X | X | PZ-12-09 | SD1 | 20.00 | 30.00 | | |
| 29 | PZ-12-10-FAL20 | WG | | | | X | X | X | X | X | PZ-12-10 | N1 | 20.00 | 30.00 | | |
| 30 | SHL-10-FAL20 | WG | | | | X | X | X | X | X | SHL-10 | N1 | 24.00 | 39.00 | | |
| 31 | SHL-11-FAL20 | WG | | | | X | X | X | X | X | SHL-11 | N1 | 12.00 | 27.00 | | |
| 32 | SHL-12-FAL20 | WG | | | | X | X | X | X | X | SHL-12 | N1 | 15.00 | 30.00 | | |
| 33 | SHL-15-FAL20 | WG | | | | X | X | X | X | X | SHL-15 | N1 | 14.00 | 24.00 | | |
| 34 | SHL-19-FAL20 | WG | | | | X | X | X | X | X | SHL-19 | N1 | 20.00 | 30.00 | | |
| 35 | SHL-20-FAL20 | WG | | | | X | X | X | X | X | SHL-20 | N1 | 39.00 | 49.00 | | |
| 36 | SHL-22-FAL20 | WG | | | | X | X | X | X | X | SHL-22 | N1 | 105.00 | 115.00 | | |

680-191150-04 Chain of Custody

**Relinquished by:** Diane Chrysne
**Date** 11-5-20
**Time** 1500
**Received by:** [signature] 11/5/20 15:00
SHL_eCOC

**Date**
**Time**
**Shipping Date:** [signature] 11/5/20 17:00
**Received by Laboratory:** [signature] TA 11-6-20 950
**Condition:**



11/20/2020

**Eurofins TestAmerica, Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

# Chain of Custody Record

eurofins Environment Testing America

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Smith, Kathryn E | Carrier Tracking No(s): | COC No: 680-632237.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: Kathy.Smith@Eurofinset.com | State of Origin: Massachusetts | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB | | Job #: 680-191150-1 |
| Address: 4955 Yarrow Street, , | Due Date Requested: 11/18/2020 | | | |
| City: Arvada | TAT Requested (days): | | | |
| State, Zip: CO, 80002 | | | | |
| Phone: 303-736-0100(Tel) 303-431-7171(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Fort Devens | Project #: 68023801 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 2320B/ Alkalinity | 353.2_Pres | 9060A/ (MOD) Waters - TOC Duplicates | 9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | | | |
| G6M-18-01-FAL20 (680-191150-1) | 11/5/20 | 10:35 Eastern | | Water | | | X | X | X | | 3 | |
| EPA-PZ-2012-2A-FAL20 (680-191150-4) | 11/5/20 | 11:15 Eastern | | Water | | | X | | | X | 2 | |
| EPA-PZ-2012-2B-FAL20 (680-191150-5) | 11/5/20 | 12:50 Eastern | | Water | | | X | | | X | 2 | |
| PZ-12-07-FAL20 (680-191150-6) | 11/5/20 | 13:20 Eastern | | Water | | | X | | | X | 2 | |
| PZ-12-08-FAL20 (680-191150-7) | 11/5/20 | 14:30 Eastern | | Water | | | X | | | X | 2 | |

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* |
| Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 | Special Instructions/QC Requirements: |

| | | | |
|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |

| | | | | | |
|---|---|---|---|---|---|
| Relinquished by: | Date/Time: 11-6-2020/1500 | Company | Received by: | Date/Time: 11/7/20 1020 | Company: ETA-Den |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| | | |
|---|---|---|
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: 1334404 | Cooler Temperature(s) °C and Other Remarks: 1.4 IR# 11-0.3 |

Ver: 01/16/2019

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191150-1

**Login Number: 191150**
**List Number: 1**
**Creator: Sims, Robert D**

**List Source: Eurofins TestAmerica, Savannah**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | False | Received Trip Blank(s) not listed on COC. |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-191150-1

**Login Number: 191150**
**List Number: 2**
**Creator: Pottruff, Reed W**

**List Source: Eurofins TestAmerica, Denver**
**List Creation: 11/07/20 01:19 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | N/A | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Attachment 6

## Data Validation Report

**Dissolved Metals**
SW 846/6010C/6020A
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 280-101020-1 |
| Laboratory: Test America, Denver, CO | Date: 09/27/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 280-101020-1 | SB-2017-05-22-24 | 9/7/2017 | Dissolved As, Fe and Mn | Groundwater |
| 280-101020-2 | SB-2017-05-32-34 | 9/7/2017 | Dissolved As, Fe and Mn | Groundwater |
| 280-101020-3 | SB-2017-02-32-34 | 9/7/2017 | Dissolved As, Fe and Mn | Groundwater |
| 280-101020-4 | SB-2017-02-42-44 | 9/7/2017 | Dissolved As, Fe and Mn | Groundwater |
| 280-101020-5 | SB-2017-02-52-54 | 9/7/2017 | Dissolved As, Fe and Mn | Groundwater |
| 280-101020-6 | SB-2017-02-62-64 | 9/7/2017 | Dissolved As, Fe and Mn | Groundwater |
| 280-101020-7 | SB-2017-02-72-74 | 9/7/2017 | Dissolved As, Fe and Mn | Groundwater |
| 280-101020-8 | SB-2017-05-42-44 | 9/8/2017 | Dissolved As, Fe and Mn | Groundwater |
| 280-101020-9 | SB-2017-05-52-54 | 9/8/2017 | Dissolved As, Fe and Mn | Groundwater |
| 280-101020-10 | SB-2017-05-62-64 | 9/8/2017 | Dissolved As, Fe and Mn | Groundwater |
| 280-101020-11 | SB-2017-05-72-74 | 9/8/2017 | Dissolved As, Fe and Mn | Groundwater |

Summary - Data validation was performed on the data for eleven (11) groundwater profile samples collected from capture zone locations on 9/7 and 9/8/2017 during drilling activities at Shepley's Hill. All samples were submitted for dissolved metals analyses by Method SW846/6010C for iron and manganese and Method SW846/6020A for arsenic. Samples were filtered in the field and preserved for sample shipment. Samples were shipped directly to Test America-Denver due to the closure of Test America-Savannah owing to Hurricane Irma.

Sample Delivery and Condition – All samples arrived at the laboratory on 9/9/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the 6-month holding time required for preserved aqueous samples.

*Qualification:* None required

Laboratory Control Sample – The LCS recoveries for the reported target analytes met all %R control limits.

*Qualification:* None required.

MS/MSD – Sample SB-2017-02-62-64 (Lab Sample ID: 280-101020-6) was spiked and analyzed as MS/MSD samples. The MS/MSD %Rs for iron were outside control limits. The native sample results for iron were greater than four (4) times the spike level and the %Rs could not be calculated. The %Rs and RPDs for the remaining analytes were within control limits.

*Qualification:* None required.

Method Blank – The method blanks associated and analyzed with these samples were non-detect for all target analytes.

*Qualification:* None required.

Field Duplicate – Field duplicate samples were not submitted with this sample set.

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "PQL U." Analyte detections below the PQL were reported as J qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table -** The dissolved metals results reported in this SDG are acceptable as reported. The data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value (µg/L) | Lab Qualifier | Validated Value | Validation Qualifier (µg/L) |
|---|---|---|---|---|---|---|
| 280-101020-1 | SB-2017-05-22-24 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 280-101020-2 | SB-2017-05-32-34 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 280-101020-3 | SB-2017-02-32-34 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 280-101020-4 | SB-2017-02-42-44 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 280-101020-5 | SB-2017-02-52-54 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 280-101020-6 | SB-2017-02-62-64 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 280-101020-7 | SB-2017-02-72-74 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 280-101020-8 | SB-2017-05-42-44 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 280-101020-9 | SB-2017-05-52-54 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 280-101020-10 | SB-2017-05-62-64 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 280-101020-11 | SB-2017-05-72-74 | Dissolved As, Fe and Mn | No qualifications needed. | | | |

**Miscellaneous Chemistry Parameters**
Alkalinity (SM2320B), Sulfate/Chloride (SW9056A) and Dissolved Organic Carbon (DOC) (SW9060)
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 280-101020-1 |
| Laboratory: Test America, Denver, CO | Date: 09/27/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 280-101020-1 | SB-2017-05-22-24 | 9/7/2017 | Miscellaneous Parameters | Groundwater |
| 280-101020-2 | SB-2017-05-32-34 | 9/7/2017 | Miscellaneous Parameters | Groundwater |
| 280-101020-3 | SB-2017-02-32-34 | 9/7/2017 | Miscellaneous Parameters | Groundwater |
| 280-101020-4 | SB-2017-02-42-44 | 9/7/2017 | Miscellaneous Parameters | Groundwater |
| 280-101020-5 | SB-2017-02-52-54 | 9/7/2017 | Miscellaneous Parameters | Groundwater |
| 280-101020-6 | SB-2017-02-62-64 | 9/7/2017 | Miscellaneous Parameters | Groundwater |
| 280-101020-7 | SB-2017-02-72-74 | 9/7/2017 | Miscellaneous Parameters | Groundwater |
| 280-101020-8 | SB-2017-05-42-44 | 9/8/2017 | Miscellaneous Parameters | Groundwater |
| 280-101020-9 | SB-2017-05-52-54 | 9/8/2017 | Miscellaneous Parameters | Groundwater |
| 280-101020-10 | SB-2017-05-62-64 | 9/8/2017 | Miscellaneous Parameters | Groundwater |
| 280-101020-11 | SB-2017-05-72-74 | 9/8/2017 | Miscellaneous Parameters | Groundwater |

Summary - Data validation was performed on the data for eleven (11) groundwater profile samples collected from capture zone locations on 9/7 and 9/8/2017 during drilling activities at Shepley's Hill. All samples were submitted for the miscellaneous wet chemistry analyses listed above. Samples submitted for dissolved organic carbon (DOC) analyses were field filtered. Samples were shipped directly to Test America-Denver due to the closure of Test America-Savannah owing to Hurricane Irma.

Sample Delivery and Condition – All samples arrived at the laboratory on 9/9/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required.

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the respective holding times required for preserved aqueous samples.

*Qualification:* None required.

Method Blank –The method blanks for DOC, chloride and sulfate were free from contamination.

Low level contamination was detected in the method blanks prepared and analyzed for alkalinity at 2.63 and 3.4 mg/L. All alkalinity sample results were greater than five times the blank levels.

*Qualification:* None required.

Laboratory Control Sample – The LCS %R results for all methods associated with these samples met the control limits.

*Qualification:* None required.

MS/MSD – Sample SB-2017-02-62-64 (Lab Sample ID: 280-101026-6) was spiked and analyzed as MS/MSD samples for DOC, chloride and sulfate. The %Rs and RPDs for the spiked analytes were within control limits.

*Qualification:* None required.

Field Duplicate – Field duplicate samples were not submitted with this data set.

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "LOQ U." Analyte detections below the LOQ were reported as J- qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table** - The miscellaneous parameter results reported in this SDG are acceptable as reported. The data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value (mg/L) | Lab Qualifier | Validated Value | Validation Qualifier (mg/L) |
|---|---|---|---|---|---|---|
| 280-101020-1 | SB-2017-05-22-24 | Miscellaneous Parameters | No qualifications needed. | | | |
| 280-101020-2 | SB-2017-05-32-34 | Miscellaneous Parameters | No qualifications needed. | | | |
| 280-101020-3 | SB-2017-02-32-34 | Miscellaneous Parameters | No qualifications needed. | | | |
| 280-101020-4 | SB-2017-02-42-44 | Miscellaneous Parameters | No qualifications needed. | | | |
| 280-101020-5 | SB-2017-02-52-54 | Miscellaneous Parameters | No qualifications needed. | | | |
| 280-101020-6 | SB-2017-02-62-64 | Miscellaneous Parameters | No qualifications needed. | | | |
| 280-101020-7 | SB-2017-02-72-74 | Miscellaneous Parameters | No qualifications needed. | | | |
| 280-101020-8 | SB-2017-05-42-44 | Miscellaneous Parameters | No qualifications needed. | | | |
| 280-101020-9 | SB-2017-05-52-54 | Miscellaneous Parameters | No qualifications needed. | | | |
| 280-101020-10 | SB-2017-05-62-64 | Miscellaneous Parameters | No qualifications needed. | | | |
| 280-101020-11 | SB-2017-05-72-74 | Miscellaneous Parameters | No qualifications needed. | | | |

**SHL 2017 Drilling Validated Data - 101020**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 280-101020-1 | SB-2017-05-22-24 | 9/7/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 350 | | ug/L | 100 | 85 | 22 |
| 280-101020-1 | SB-2017-05-22-24 | 9/7/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 210 | | ug/L | 10 | 1 | 0.26 |
| 280-101020-1 | SB-2017-05-22-24 | 9/7/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1.6 | J | ug/L | 5 | 1 | 0.33 |
| 280-101020-1 | SB-2017-05-22-24 | 9/7/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 22 | | mg/L | 3 | 0.5 | 0.25 |
| 280-101020-1 | SB-2017-05-22-24 | 9/7/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.9 | J | mg/L | 5 | 0.5 | 0.23 |
| 280-101020-1 | SB-2017-05-22-24 | 9/7/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 8.2 | | mg/L | 1 | 0.5 | 0.16 |
| 280-101020-1 | SB-2017-05-22-24 | 9/7/2017 | SM 2320B | Total/NA | | Alkalinity | 56 | | mg/L | 5 | 3.2 | 1.1 |
| 280-101020-2 | SB-2017-05-32-34 | 9/7/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 1,700 | | ug/L | 100 | 85 | 22 |
| 280-101020-2 | SB-2017-05-32-34 | 9/7/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 95 | | ug/L | 10 | 1 | 0.26 |
| 280-101020-2 | SB-2017-05-32-34 | 9/7/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3.8 | J | ug/L | 5 | 1 | 0.33 |
| 280-101020-2 | SB-2017-05-32-34 | 9/7/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 2 | J | mg/L | 3 | 0.5 | 0.25 |
| 280-101020-2 | SB-2017-05-32-34 | 9/7/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.5 | J | mg/L | 5 | 0.5 | 0.23 |
| 280-101020-2 | SB-2017-05-32-34 | 9/7/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.4 | | mg/L | 1 | 0.5 | 0.16 |
| 280-101020-2 | SB-2017-05-32-34 | 9/7/2017 | SM 2320B | Total/NA | | Alkalinity | 20 | | mg/L | 5 | 3.2 | 1.1 |
| 280-101020-3 | SB-2017-02-32-34 | 9/7/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 61 | J | ug/L | 100 | 85 | 22 |
| 280-101020-3 | SB-2017-02-32-34 | 9/7/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 51 | | ug/L | 10 | 1 | 0.26 |
| 280-101020-3 | SB-2017-02-32-34 | 9/7/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 0.87 | J | ug/L | 5 | 1 | 0.33 |
| 280-101020-3 | SB-2017-02-32-34 | 9/7/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 3.6 | | mg/L | 3 | 0.5 | 0.25 |
| 280-101020-3 | SB-2017-02-32-34 | 9/7/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 4 | J | mg/L | 5 | 0.5 | 0.23 |
| 280-101020-3 | SB-2017-02-32-34 | 9/7/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.1 | | mg/L | 1 | 0.5 | 0.16 |
| 280-101020-3 | SB-2017-02-32-34 | 9/7/2017 | SM 2320B | Total/NA | | Alkalinity | 21 | | mg/L | 5 | 3.2 | 1.1 |
| 280-101020-4 | SB-2017-02-42-44 | 9/7/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 1,400 | | ug/L | 100 | 85 | 22 |
| 280-101020-4 | SB-2017-02-42-44 | 9/7/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 110 | | ug/L | 10 | 1 | 0.26 |
| 280-101020-4 | SB-2017-02-42-44 | 9/7/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 0.77 | J | ug/L | 5 | 1 | 0.33 |
| 280-101020-4 | SB-2017-02-42-44 | 9/7/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 6.7 | | mg/L | 3 | 0.5 | 0.25 |
| 280-101020-4 | SB-2017-02-42-44 | 9/7/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 9 | | mg/L | 5 | 0.5 | 0.23 |
| 280-101020-4 | SB-2017-02-42-44 | 9/7/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.8 | | mg/L | 1 | 0.5 | 0.16 |
| 280-101020-4 | SB-2017-02-42-44 | 9/7/2017 | SM 2320B | Total/NA | | Alkalinity | 35 | | mg/L | 5 | 3.2 | 1.1 |
| 280-101020-5 | SB-2017-02-52-54 | 9/7/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 7,100 | | ug/L | 100 | 85 | 22 |
| 280-101020-5 | SB-2017-02-52-54 | 9/7/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 690 | | ug/L | 10 | 1 | 0.26 |
| 280-101020-5 | SB-2017-02-52-54 | 9/7/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 6.3 | | ug/L | 5 | 1 | 0.33 |
| 280-101020-5 | SB-2017-02-52-54 | 9/7/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 47 | | mg/L | 3 | 0.5 | 0.25 |
| 280-101020-5 | SB-2017-02-52-54 | 9/7/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 4.8 | J | mg/L | 5 | 0.5 | 0.23 |
| 280-101020-5 | SB-2017-02-52-54 | 9/7/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.2 | | mg/L | 1 | 0.5 | 0.16 |
| 280-101020-5 | SB-2017-02-52-54 | 9/7/2017 | SM 2320B | Total/NA | | Alkalinity | 56 | | mg/L | 5 | 3.2 | 1.1 |
| 280-101020-6 | SB-2017-02-62-64 | 9/7/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 14,000 | | ug/L | 100 | 85 | 22 |
| 280-101020-6 | SB-2017-02-62-64 | 9/7/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 640 | J | ug/L | 10 | 1 | 0.26 |
| 280-101020-6 | SB-2017-02-62-64 | 9/7/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 11 | | ug/L | 5 | 1 | 0.33 |
| 280-101020-6 | SB-2017-02-62-64 | 9/7/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 28 | | mg/L | 3 | 0.5 | 0.25 |
| 280-101020-6 | SB-2017-02-62-64 | 9/7/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 1.7 | J | mg/L | 5 | 0.5 | 0.23 |
| 280-101020-6 | SB-2017-02-62-64 | 9/7/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.6 | | mg/L | 1 | 0.5 | 0.16 |
| 280-101020-6 | SB-2017-02-62-64 | 9/7/2017 | SM 2320B | Total/NA | | Alkalinity | 69 | | mg/L | 5 | 3.2 | 1.1 |
| 280-101020-7 | SB-2017-02-72-74 | 9/7/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 16,000 | | ug/L | 100 | 85 | 22 |

**SHL 2017 Drilling Validated Data - 101020**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 280-101020-7 | SB-2017-02-72-74 | 9/7/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 830 | | ug/L | 10 | 1 | 0.26 |
| 280-101020-7 | SB-2017-02-72-74 | 9/7/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 19 | | ug/L | 5 | 1 | 0.33 |
| 280-101020-7 | SB-2017-02-72-74 | 9/7/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 5.8 | | mg/L | 3 | 0.5 | 0.25 |
| 280-101020-7 | SB-2017-02-72-74 | 9/7/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 6.8 | | mg/L | 5 | 0.5 | 0.23 |
| 280-101020-7 | SB-2017-02-72-74 | 9/7/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.4 | | mg/L | 1 | 0.5 | 0.16 |
| 280-101020-7 | SB-2017-02-72-74 | 9/7/2017 | SM 2320B | Total/NA | | Alkalinity | 78 | | mg/L | 5 | 3.2 | 1.1 |
| 280-101020-8 | SB-2017-05-42-44 | 9/8/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 4,100 | | ug/L | 100 | 85 | 22 |
| 280-101020-8 | SB-2017-05-42-44 | 9/8/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 400 | | ug/L | 10 | 1 | 0.26 |
| 280-101020-8 | SB-2017-05-42-44 | 9/8/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1.1 | J | ug/L | 5 | 1 | 0.33 |
| 280-101020-8 | SB-2017-05-42-44 | 9/8/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 31 | | mg/L | 3 | 0.5 | 0.25 |
| 280-101020-8 | SB-2017-05-42-44 | 9/8/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.4 | J | mg/L | 5 | 0.5 | 0.23 |
| 280-101020-8 | SB-2017-05-42-44 | 9/8/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.1 | | mg/L | 1 | 0.5 | 0.16 |
| 280-101020-8 | SB-2017-05-42-44 | 9/8/2017 | SM 2320B | Total/NA | | Alkalinity | 49 | | mg/L | 5 | 3.2 | 1.1 |
| 280-101020-9 | SB-2017-05-52-54 | 9/8/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 6,600 | | ug/L | 100 | 85 | 22 |
| 280-101020-9 | SB-2017-05-52-54 | 9/8/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 380 | | ug/L | 10 | 1 | 0.26 |
| 280-101020-9 | SB-2017-05-52-54 | 9/8/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 9.7 | | ug/L | 5 | 1 | 0.33 |
| 280-101020-9 | SB-2017-05-52-54 | 9/8/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 15 | | mg/L | 3 | 0.5 | 0.25 |
| 280-101020-9 | SB-2017-05-52-54 | 9/8/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 5.6 | | mg/L | 5 | 0.5 | 0.23 |
| 280-101020-9 | SB-2017-05-52-54 | 9/8/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.9 | | mg/L | 1 | 0.5 | 0.16 |
| 280-101020-9 | SB-2017-05-52-54 | 9/8/2017 | SM 2320B | Total/NA | | Alkalinity | 45 | | mg/L | 5 | 3.2 | 1.1 |
| 280-101020-10 | SB-2017-05-62-64 | 9/8/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 11,000 | | ug/L | 100 | 85 | 22 |
| 280-101020-10 | SB-2017-05-62-64 | 9/8/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 300 | | ug/L | 10 | 1 | 0.26 |
| 280-101020-10 | SB-2017-05-62-64 | 9/8/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 25 | | ug/L | 5 | 1 | 0.33 |
| 280-101020-10 | SB-2017-05-62-64 | 9/8/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 2 | J | mg/L | 3 | 0.5 | 0.25 |
| 280-101020-10 | SB-2017-05-62-64 | 9/8/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 4.5 | J | mg/L | 5 | 0.5 | 0.23 |
| 280-101020-10 | SB-2017-05-62-64 | 9/8/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.2 | | mg/L | 1 | 0.5 | 0.16 |
| 280-101020-10 | SB-2017-05-62-64 | 9/8/2017 | SM 2320B | Total/NA | | Alkalinity | 51 | | mg/L | 5 | 3.2 | 1.1 |
| 280-101020-11 | SB-2017-05-72-74 | 9/8/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 30,000 | | ug/L | 100 | 85 | 22 |
| 280-101020-11 | SB-2017-05-72-74 | 9/8/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,400 | | ug/L | 10 | 1 | 0.26 |
| 280-101020-11 | SB-2017-05-72-74 | 9/8/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 82 | | ug/L | 5 | 1 | 0.33 |
| 280-101020-11 | SB-2017-05-72-74 | 9/8/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 4.9 | | mg/L | 3 | 0.5 | 0.25 |
| 280-101020-11 | SB-2017-05-72-74 | 9/8/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 5.1 | | mg/L | 5 | 0.5 | 0.23 |
| 280-101020-11 | SB-2017-05-72-74 | 9/8/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.5 | | mg/L | 1 | 0.5 | 0.16 |
| 280-101020-11 | SB-2017-05-72-74 | 9/8/2017 | SM 2320B | Total/NA | | Alkalinity | 100 | | mg/L | 5 | 3.2 | 1.1 |

Notes:

mg/l = milligram per liter

µg/L = microgram per liter

LOQ = Limit of Quantitation

LOD = Limit of Detection

DL = Method Detection Limit

**Dissolved Metals**
SW 846/6010C/6020A
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-142686-1 |
| Laboratory: Test America, Savannah, GA | Date: 09/21/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-142686-1 | SB-2017-10-72-74 | 8/25/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-2 | SB-2017-12-42-44 | 8/28/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-3 | SB-2017-12-52-54 | 8/28/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-4 | SB-2017-11-22-24 | 8/28/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-5 | SB-2017-11-32-34 | 8/28/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-6 | SB-2017-11-42-44 | 8/28/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-7 | SB-2017-DUP-04 | 8/28/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-8 | SB-2017-11-52-54 | 8/28/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-9 | SB-2017-12-62-64 | 8/28/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-10 | SB-2017-11-62-64 | 8/29/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-11 | SB-2017-11-72-74 | 8/29/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-12 | SB-2017-01-22-24 | 8/29/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-13 | SB-2017-01-32-34 | 8/29/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-14 | SB-2017-12-72-74 | 8/29/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-15 | SB-2017-12-82-84 | 8/29/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-16 | SB-2017-12-92-94 | 8/29/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-17 | SB-2017-12-99-101 | 8/30/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-18 | SB-2017-01-42-44 | 8/30/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-19 | SB-2017-01-52-54 | 8/30/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-20 | SB-2017-01-62-64 | 8/30/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142686-21 | SB-2017-DUP-05 | 8/30/2017 | Dissolved As, Fe, Mn | Groundwater |

Summary - Data validation was performed on the data for nineteen (19) groundwater profile samples and two (2) field duplicate samples collected from upgradient and capture zone locations on 8/25, 8/28, 8/29 and 8/30/2017 during drilling activities at Shepley's Hill. All samples were submitted for dissolved metals analyses by Method SW846/6010C for iron and manganese and Method SW846/6020A for arsenic. Samples were filtered in the field and preserved for sample shipment.

Sample Delivery and Condition – All samples arrived at the laboratory on 8/31/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the 6-month holding time required for preserved aqueous samples.

*Qualification:* None required

Laboratory Control Sample – The LCS recoveries for the reported target analytes met all %R control limits.

*Qualification:* None required.

MS/MSD – Two sets of MS/MSD samples were submitted with this sample set. Sample SB-2017-11-42-44 (Lab Sample ID: 680-142686-6) and sample SB-2017-01-52-54 (Lab Sample ID: 680-142686-19) were spiked and analyzed as MS/MSD samples. The %Rs and RPDs for manganese in both sets of MS/MSD samples were within control limits. The results for iron in both samples were greater than four (4) times the MS spike levels and the %Rs could not be accurately calculated. The MS %R for arsenic from sample SB-2017-11-42-44 and the MS/MSD %Rs from sample SB-2017-01-52-54 were below control limits. These low spike recoveries are likely due to matrix effects.

*Qualification:* The results for arsenic in samples SB-2017-11-42-44 (Lab Sample ID: 680-142686-6) and SB-2017-01-52-54 (Lab Sample ID: 680-142686-19) were qualified as estimated (J).

Method Blank – The method blanks associated and analyzed with these samples were non-detect for all target analytes.

*Qualification:* None required.

Field Duplicate – Two set of field duplicate samples were submitted with this sample set. Sample SB-2017-DUP-04 (Lab Sample ID: 680-142686-7) was the field duplicate sample of SB-2017-11-32-34 (Lab Sample ID: 680-142686-5). Sample SB-2017-DUP-05 (Lab Sample ID: 680-142686-21) was the field duplicate sample of SB-2017-01-82-84 (Lab Sample ID: 680-142686-20). Detected results were comparable for all analytes with RPDs less than 20%. FD sample results are summarized in the table below.

| Lab Sample ID | 680-142686-20 | 680-142686-21 | |
|---|---|---|---|
| Client Sample ID | SB-2017-01-62-64 | SB-2017-DUP-05 | |
| Collection Date | 8/30/2017 | 8/30/2017 | |
| **Analyte** | **Result (µg/L)** | **Result (µg/L)** | **RPD (%)** |
| Iron | 71,000 | 74,000 | 4.1 |
| Manganese | 2,000 | 2,100 | 4.9 |
| Arsenic | 81 | 96 | 16.9 |
| Lab Sample ID | 680-142686-5 | 680-142686-7 | |
| Client Sample ID | SB-2017-11-32-34 | SB-2017-DUP-04 | |
| Collection Date | 8/28/2017 | 8/28/2017 | |
| **Analyte** | **Result (µg/L)** | **Result (µg/L)** | **RPD (%)** |
| Iron | 20,000 | 19,000 | 5.1 |
| Manganese | 2,100 | 2,000 | 4.9 |
| Arsenic | 160 | 150 | 6.5 |

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "PQL U." Analyte detections below the PQL were reported as J qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table -** The dissolved metals results reported in this SDG are acceptable with the noted qualifications and the data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value (µg/L) | Lab Qualifier | Validated Value (µg/L) | Validation Qualifier |
|---|---|---|---|---|---|---|
| 680-142686-1 | SB-2017-10-72-74 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-2 | SB-2017-12-42-44 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-3 | SB-2017-12-52-54 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-4 | SB-2017-11-22-24 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-5 | SB-2017-11-32-34 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-6 | SB-2017-11-42-44 | Dissolved As, Fe, Mn | 63 | J | 63 | J |
| 680-142686-7 | SB-2017-DUP-04 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-8 | SB-2017-11-52-54 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-9 | SB-2017-12-62-64 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-10 | SB-2017-11-62-64 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-11 | SB-2017-11-72-74 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-12 | SB-2017-01-22-24 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-13 | SB-2017-01-32-34 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-14 | SB-2017-12-72-74 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-15 | SB-2017-12-82-84 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-16 | SB-2017-12-92-94 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-17 | SB-2017-12-99-101 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-18 | SB-2017-01-42-44 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-19 | SB-2017-01-52-54 | Dissolved As | 130 | J | 130 | J |
| 680-142686-20 | SB-2017-01-62-64 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142686-21 | SB-2017-DUP-05 | Dissolved As, Fe, Mn | No qualifications needed. | | | |

**Miscellaneous Chemistry Parameters**
Alkalinity (SM2320B), Sulfate/Chloride (SW9056A) and Dissolved Organic Carbon (DOC) (SW9060), pH (SW9040C)
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-142686-1 |
| Laboratory: Test America, Savannah, GA | Date: 09/08/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-142686-1 | SB-2017-10-72-74 | 8/25/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-2 | SB-2017-12-42-44 | 8/28/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-3 | SB-2017-12-52-54 | 8/28/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-4 | SB-2017-11-22-24 | 8/28/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-5 | SB-2017-11-32-34 | 8/28/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-6 | SB-2017-11-42-44 | 8/28/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-7 | SB-2017-DUP-04 | 8/28/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-8 | SB-2017-11-52-54 | 8/28/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-9 | SB-2017-12-62-64 | 8/28/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-10 | SB-2017-11-62-64 | 8/29/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-11 | SB-2017-11-72-74 | 8/29/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-12 | SB-2017-01-22-24 | 8/29/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-13 | SB-2017-01-32-34 | 8/29/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-14 | SB-2017-12-72-74 | 8/29/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-15 | SB-2017-12-82-84 | 8/29/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-16 | SB-2017-12-92-94 | 8/29/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-17 | SB-2017-12-99-101 | 8/30/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-18 | SB-2017-01-42-44 | 8/30/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-19 | SB-2017-01-52-54 | 8/30/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-20 | SB-2017-01-62-64 | 8/30/2017 | Miscellaneous Parameters | Groundwater |
| 680-142686-21 | SB-2017-DUP-05 | 8/30/2017 | Miscellaneous Parameters | Groundwater |

Summary - Data validation was performed on the data for nineteen (19) groundwater profile samples and two (2) field duplicate samples collected from upgradient and capture zone locations on 8/25, 8/28, 8/29 and 8/30/2017 during drilling activities at Shepley's Hill. All samples were submitted for the miscellaneous wet chemistry analyses listed above. Three samples were analyzed at the laboratory for pH to confirm erroneous field readings. Samples submitted for dissolved organic carbon (DOC) analyses were field filtered. The samples submitted for alkalinity and DOC analyses were shipped to Test America Denver for analysis.

Sample Delivery and Condition – All samples arrived at the laboratory on 8/31/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible

COCs were corrected prior to sample reporting.

*Qualification:* None required.

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the respective holding times required for preserved aqueous samples.

*Qualification:* None required.

Method Blank –The method blanks for DOC, chloride and sulfate were free from contamination. Low level contamination was detected in the method blanks prepared and analyzed for alkalinity ranging from 2.48 to 3.47 mg/L. All reported alkalinity sample results were greater than ten times the blank levels.

*Qualification:* None required.

Laboratory Control Sample – The LCS %R results for all methods associated with these samples met the control limits.

*Qualification:* None required.

MS/MSD – Two sets of MS/MSD samples were submitted with this sample set. Sample SB-2017-11-42-44 (Lab Sample ID: 680-142686-6) and sample SB-2017-01-52-54 (Lab Sample ID: 680-142686-19) were spiked and analyzed as MS/MSD samples for chloride, sulfate and DOC. The MS/MSD %Rs and RPDs were within control limits.

*Qualification:* None required.

Field Duplicate – Two set of field duplicate samples were submitted with this sample set. Sample SB-2017-DUP-04 (Lab Sample ID: 680-142686-7) was the field duplicate sample of SB-2017-11-32-34 (Lab Sample ID: 680-142686-5). Sample SB-2017-DUP-05 (Lab Sample ID: 680-142686-21) was the field duplicate sample of SB-2017-01-82-84 (Lab Sample ID: 680-142686-20). Detected results were comparable for all analytes with RPDs less than 10%. FD sample results are summarized in the table below.

| Lab Sample ID | 680-142686-5 | 680-142686-7 | |
|---|---|---|---|
| Client Sample ID | SB-2017-11-32-34 | SB-2017-DUP-04 | |
| Collection Date | 8/28/2017 | 8/28/2017 | |
| **Analyte** | **Result (mg/L)** | **Result (mg/L)** | **RPD (%)** |
| Chloride | 1.5 | 1.5 | 0 |
| Sulfate | 3.8 | 3.6 | 5.4 |
| DOC | 1.9 | 1.9 | 0 |
| Alkalinity | 35 | 41 | 15.8 |
| Lab Sample ID | 680-142686-20 | 680-142686-21 | |
| Client Sample ID | SB-2017-01-62-64 | SB-2017-DUP-05 | |
| Collection Date | 8/30/2017 | 8/30/2017 | |
| **Analyte** | **Result (mg/L)** | **Result (mg/L)** | **RPD (%)** |
| Chloride | 6.7 | 6.7 | 0 |
| Sulfate | 0.4 | 0.42 | 4.9 |
| DOC | 7.8 | 7.7 | 1.3 |
| Alkalinity | 330 | 320 | 3.1 |

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "LOQ U." Analyte detections below the LOQ were reported as J-qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table** - The miscellaneous parameter results reported in this SDG are acceptable as reported. The data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value (mg/L) | Lab Qualifier | Validated Value (mg/L) | Validation Qualifier |
|---|---|---|---|---|---|---|
| 680-142686-1 | SB-2017-10-72-74 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-2 | SB-2017-12-42-44 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-3 | SB-2017-12-52-54 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-4 | SB-2017-11-22-24 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-5 | SB-2017-11-32-34 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-6 | SB-2017-11-42-44 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-7 | SB-2017-DUP-04 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-8 | SB-2017-11-52-54 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-9 | SB-2017-12-62-64 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-10 | SB-2017-11-62-64 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-11 | SB-2017-11-72-74 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-12 | SB-2017-01-22-24 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-13 | SB-2017-01-32-34 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-14 | SB-2017-12-72-74 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-15 | SB-2017-12-82-84 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-16 | SB-2017-12-92-94 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-17 | SB-2017-12-99-101 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-18 | SB-2017-01-42-44 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-19 | SB-2017-01-52-54 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-20 | SB-2017-01-62-64 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142686-21 | SB-2017-DUP-05 | Miscellaneous Parameters | No qualifications needed. | | | |

**SHL 2017 Drilling Validated Data - 142686**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142686-1 | SB-2017-10-72-74 | 8/25/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 48,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-1 | SB-2017-10-72-74 | 8/25/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 5,600 | | ug/L | 10 | 3 | 1 |
| 680-142686-1 | SB-2017-10-72-74 | 8/25/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 2,500 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-1 | SB-2017-10-72-74 | 8/25/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 22 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-1 | SB-2017-10-72-74 | 8/25/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 14 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-1 | SB-2017-10-72-74 | 8/25/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.8 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-1 | SB-2017-10-72-74 | 8/25/2017 | SM 2320B | Total/NA | | Alkalinity | 180 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-2 | SB-2017-12-42-44 | 8/28/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 7,800 | | ug/L | 50 | 50 | 17 |
| 680-142686-2 | SB-2017-12-42-44 | 8/28/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 5,400 | | ug/L | 10 | 3 | 1 |
| 680-142686-2 | SB-2017-12-42-44 | 8/28/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 5.3 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-2 | SB-2017-12-42-44 | 8/28/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 1.2 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-2 | SB-2017-12-42-44 | 8/28/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 7.9 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-2 | SB-2017-12-42-44 | 8/28/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.1 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-2 | SB-2017-12-42-44 | 8/28/2017 | SM 2320B | Total/NA | | Alkalinity | 53 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-3 | SB-2017-12-52-54 | 8/28/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 21,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-3 | SB-2017-12-52-54 | 8/28/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,300 | | ug/L | 10 | 3 | 1 |
| 680-142686-3 | SB-2017-12-52-54 | 8/28/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 90 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-3 | SB-2017-12-52-54 | 8/28/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 4.2 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-3 | SB-2017-12-52-54 | 8/28/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 6 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-3 | SB-2017-12-52-54 | 8/28/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-3 | SB-2017-12-52-54 | 8/28/2017 | SM 2320B | Total/NA | | Alkalinity | 64 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-4 | SB-2017-11-22-24 | 8/28/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 15,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-4 | SB-2017-11-22-24 | 8/28/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 840 | | ug/L | 10 | 3 | 1 |
| 680-142686-4 | SB-2017-11-22-24 | 8/28/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 62 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-4 | SB-2017-11-22-24 | 8/28/2017 | 9040C | NA | | pH | 6.9 | HF | SU | | | |
| 680-142686-4 | SB-2017-11-22-24 | 8/28/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 0.52 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-4 | SB-2017-11-22-24 | 8/28/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.3 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-4 | SB-2017-11-22-24 | 8/28/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.6 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-4 | SB-2017-11-22-24 | 8/28/2017 | SM 2320B | Total/NA | | Alkalinity | 26 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-5 | SB-2017-11-32-34 | 8/28/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 20,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-5 | SB-2017-11-32-34 | 8/28/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,100 | | ug/L | 10 | 3 | 1 |
| 680-142686-5 | SB-2017-11-32-34 | 8/28/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 160 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-5 | SB-2017-11-32-34 | 8/28/2017 | 9040C | NA | | pH | 6.9 | HF | SU | | | |
| 680-142686-5 | SB-2017-11-32-34 | 8/28/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 1.5 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-5 | SB-2017-11-32-34 | 8/28/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.8 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-5 | SB-2017-11-32-34 | 8/28/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.9 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-5 | SB-2017-11-32-34 | 8/28/2017 | SM 2320B | Total/NA | | Alkalinity | 35 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-6 | SB-2017-11-42-44 | 8/28/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 29,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-6 | SB-2017-11-42-44 | 8/28/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 590 | | ug/L | 10 | 3 | 1 |
| 680-142686-6 | SB-2017-11-42-44 | 8/28/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 63 | J | ug/L | 3 | 3 | 1.5 |

**SHL 2017 Drilling Validated Data - 142686**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142686-6 | SB-2017-11-42-44 | 8/28/2017 | 9040C | NA | | pH | 7 | HF | SU | | | |
| 680-142686-6 | SB-2017-11-42-44 | 8/28/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 6.8 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-6 | SB-2017-11-42-44 | 8/28/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 5.9 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-6 | SB-2017-11-42-44 | 8/28/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-6 | SB-2017-11-42-44 | 8/28/2017 | SM 2320B | Total/NA | | Alkalinity | 110 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-7 | SB-2017-DUP-04 | 8/28/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 19,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-7 | SB-2017-DUP-04 | 8/28/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,000 | | ug/L | 10 | 3 | 1 |
| 680-142686-7 | SB-2017-DUP-04 | 8/28/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 150 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-7 | SB-2017-DUP-04 | 8/28/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 1.5 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-7 | SB-2017-DUP-04 | 8/28/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.6 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-7 | SB-2017-DUP-04 | 8/28/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.9 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-7 | SB-2017-DUP-04 | 8/28/2017 | SM 2320B | Total/NA | | Alkalinity | 41 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-8 | SB-2017-11-52-54 | 8/28/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 71,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-8 | SB-2017-11-52-54 | 8/28/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 3,500 | | ug/L | 10 | 3 | 1 |
| 680-142686-8 | SB-2017-11-52-54 | 8/28/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 160 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-8 | SB-2017-11-52-54 | 8/28/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 27 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-8 | SB-2017-11-52-54 | 8/28/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 1.5 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-8 | SB-2017-11-52-54 | 8/28/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 5 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-8 | SB-2017-11-52-54 | 8/28/2017 | SM 2320B | Total/NA | | Alkalinity | 290 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-9 | SB-2017-12-62-64 | 8/28/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 34,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-9 | SB-2017-12-62-64 | 8/28/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,300 | | ug/L | 10 | 3 | 1 |
| 680-142686-9 | SB-2017-12-62-64 | 8/28/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 110 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-9 | SB-2017-12-62-64 | 8/28/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 13 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-9 | SB-2017-12-62-64 | 8/28/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.3 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-9 | SB-2017-12-62-64 | 8/28/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.6 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-9 | SB-2017-12-62-64 | 8/28/2017 | SM 2320B | Total/NA | | Alkalinity | 110 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-10 | SB-2017-11-62-64 | 8/29/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 98,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-10 | SB-2017-11-62-64 | 8/29/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 990 | | ug/L | 10 | 3 | 1 |
| 680-142686-10 | SB-2017-11-62-64 | 8/29/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 430 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-10 | SB-2017-11-62-64 | 8/29/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 16 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-10 | SB-2017-11-62-64 | 8/29/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 0.55 | J | mg/L | 1 | 1 | 0.4 |
| 680-142686-10 | SB-2017-11-62-64 | 8/29/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.5 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-10 | SB-2017-11-62-64 | 8/29/2017 | SM 2320B | Total/NA | | Alkalinity | 250 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-11 | SB-2017-11-72-74 | 8/29/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 60,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-11 | SB-2017-11-72-74 | 8/29/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,500 | | ug/L | 10 | 3 | 1 |
| 680-142686-11 | SB-2017-11-72-74 | 8/29/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1,900 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-11 | SB-2017-11-72-74 | 8/29/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 23 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-11 | SB-2017-11-72-74 | 8/29/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 16 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-11 | SB-2017-11-72-74 | 8/29/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.2 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-11 | SB-2017-11-72-74 | 8/29/2017 | SM 2320B | Total/NA | | Alkalinity | 180 | | mg/L | 5 | 3.2 | 1.1 |

**SHL 2017 Drilling Validated Data - 142686**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142686-12 | SB-2017-01-22-24 | 8/29/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 13,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-12 | SB-2017-01-22-24 | 8/29/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 580 | | ug/L | 10 | 3 | 1 |
| 680-142686-12 | SB-2017-01-22-24 | 8/29/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 51 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-12 | SB-2017-01-22-24 | 8/29/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 1.8 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-12 | SB-2017-01-22-24 | 8/29/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 5 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-12 | SB-2017-01-22-24 | 8/29/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 5.9 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-12 | SB-2017-01-22-24 | 8/29/2017 | SM 2320B | Total/NA | | Alkalinity | 87 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-13 | SB-2017-01-32-34 | 8/29/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 2,200 | | ug/L | 50 | 50 | 17 |
| 680-142686-13 | SB-2017-01-32-34 | 8/29/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 82 | | ug/L | 10 | 3 | 1 |
| 680-142686-13 | SB-2017-01-32-34 | 8/29/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3.9 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-13 | SB-2017-01-32-34 | 8/29/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 0.82 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-13 | SB-2017-01-32-34 | 8/29/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.1 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-13 | SB-2017-01-32-34 | 8/29/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.5 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-13 | SB-2017-01-32-34 | 8/29/2017 | SM 2320B | Total/NA | | Alkalinity | 35 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-14 | SB-2017-12-72-74 | 8/29/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 39,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-14 | SB-2017-12-72-74 | 8/29/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,700 | | ug/L | 10 | 3 | 1 |
| 680-142686-14 | SB-2017-12-72-74 | 8/29/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 87 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-14 | SB-2017-12-72-74 | 8/29/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 14 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-14 | SB-2017-12-72-74 | 8/29/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.9 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-14 | SB-2017-12-72-74 | 8/29/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-14 | SB-2017-12-72-74 | 8/29/2017 | SM 2320B | Total/NA | | Alkalinity | 120 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-15 | SB-2017-12-82-84 | 8/29/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 5,900 | | ug/L | 50 | 50 | 17 |
| 680-142686-15 | SB-2017-12-82-84 | 8/29/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 16,000 | | ug/L | 10 | 3 | 1 |
| 680-142686-15 | SB-2017-12-82-84 | 8/29/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 5.1 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-15 | SB-2017-12-82-84 | 8/29/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 23 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-15 | SB-2017-12-82-84 | 8/29/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 1.3 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-15 | SB-2017-12-82-84 | 8/29/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.1 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-15 | SB-2017-12-82-84 | 8/29/2017 | SM 2320B | Total/NA | | Alkalinity | 210 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-16 | SB-2017-12-92-94 | 8/29/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 13,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-16 | SB-2017-12-92-94 | 8/29/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 12,000 | | ug/L | 10 | 3 | 1 |
| 680-142686-16 | SB-2017-12-92-94 | 8/29/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 18 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-16 | SB-2017-12-92-94 | 8/29/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 32 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-16 | SB-2017-12-92-94 | 8/29/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 5.2 | | mg/L | 1 | 1 | 0.4 |
| 680-142686-16 | SB-2017-12-92-94 | 8/29/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-16 | SB-2017-12-92-94 | 8/29/2017 | SM 2320B | Total/NA | | Alkalinity | 220 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-17 | SB-2017-12-99-101 | 8/30/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 960 | | ug/L | 50 | 50 | 17 |
| 680-142686-17 | SB-2017-12-99-101 | 8/30/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 15,000 | | ug/L | 10 | 3 | 1 |
| 680-142686-17 | SB-2017-12-99-101 | 8/30/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 5.1 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-17 | SB-2017-12-99-101 | 8/30/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 35 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-17 | SB-2017-12-99-101 | 8/30/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 7.9 | | mg/L | 1 | 1 | 0.4 |

**SHL 2017 Drilling Validated Data - 142686**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142686-17 | SB-2017-12-99-101 | 8/30/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.7 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-17 | SB-2017-12-99-101 | 8/30/2017 | SM 2320B | Total/NA | | Alkalinity | 280 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-18 | SB-2017-01-42-44 | 8/30/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 85,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-18 | SB-2017-01-42-44 | 8/30/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,700 | | ug/L | 10 | 3 | 1 |
| 680-142686-18 | SB-2017-01-42-44 | 8/30/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 47 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-18 | SB-2017-01-42-44 | 8/30/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 11 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-18 | SB-2017-01-42-44 | 8/30/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 0.7 | J | mg/L | 1 | 1 | 0.4 |
| 680-142686-18 | SB-2017-01-42-44 | 8/30/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 17 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-18 | SB-2017-01-42-44 | 8/30/2017 | SM 2320B | Total/NA | | Alkalinity | 450 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-19 | SB-2017-01-52-54 | 8/30/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 83,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-19 | SB-2017-01-52-54 | 8/30/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,600 | | ug/L | 10 | 3 | 1 |
| 680-142686-19 | SB-2017-01-52-54 | 8/30/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 130 | J | ug/L | 3 | 3 | 1.5 |
| 680-142686-19 | SB-2017-01-52-54 | 8/30/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 5.4 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-19 | SB-2017-01-52-54 | 8/30/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 0.65 | J | mg/L | 1 | 1 | 0.4 |
| 680-142686-19 | SB-2017-01-52-54 | 8/30/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 6.9 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-19 | SB-2017-01-52-54 | 8/30/2017 | SM 2320B | Total/NA | | Alkalinity | 310 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-20 | SB-2017-01-62-64 | 8/30/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 71,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-20 | SB-2017-01-62-64 | 8/30/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,000 | | ug/L | 10 | 3 | 1 |
| 680-142686-20 | SB-2017-01-62-64 | 8/30/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 81 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-20 | SB-2017-01-62-64 | 8/30/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 6.7 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-20 | SB-2017-01-62-64 | 8/30/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 0.4 | J | mg/L | 1 | 1 | 0.4 |
| 680-142686-20 | SB-2017-01-62-64 | 8/30/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 7.8 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-20 | SB-2017-01-62-64 | 8/30/2017 | SM 2320B | Total/NA | | Alkalinity | 330 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142686-21 | SB-2017-DUP-05 | 8/30/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 74,000 | | ug/L | 50 | 50 | 17 |
| 680-142686-21 | SB-2017-DUP-05 | 8/30/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,100 | | ug/L | 10 | 3 | 1 |
| 680-142686-21 | SB-2017-DUP-05 | 8/30/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 96 | | ug/L | 3 | 3 | 1.5 |
| 680-142686-21 | SB-2017-DUP-05 | 8/30/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 6.7 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142686-21 | SB-2017-DUP-05 | 8/30/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 0.42 | J | mg/L | 1 | 1 | 0.4 |
| 680-142686-21 | SB-2017-DUP-05 | 8/30/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 7.7 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142686-21 | SB-2017-DUP-05 | 8/30/2017 | SM 2320B | Total/NA | | Alkalinity | 320 | | mg/L | 5 | 3.2 | 1.1 |

Notes:

mg/l = milligram per liter

µg/L = microgram per liter

LOQ = Limit of Quantitation

LOD = Limit of Detection

DL = Method Detection Limit

**Dissolved Metals**
SW 846/6010C/6020A
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-142774-1 |
| Laboratory: Test America, Savannah, GA | Date: 09/21/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-142774-1 | SB-2017-06-55-57A | 8/31/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142774-2 | SB-2017-03-22-24 | 8/31/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142774-3 | SB-2017-03-32-34 | 8/31/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142774-4 | SB-2017-03-42-44 | 9/1/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142774-5 | SB-2017-03-52-54 | 9/1/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142774-6 | SB-2017-03-62-64 | 9/1/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142774-7 | SB-2017-0-DUP-06 | 9/1/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142774-8 | SB-2017-04-32-34 | 9/1/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142774-9 | SB-2017-04-42-44 | 9/1/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142774-10 | SB-2017-04-22-24 | 8/31/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142774-11 | SB-2017-01-92-94 | 8/31/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142774-12 | SB-2017-01-72-74 | 8/31/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142774-13 | SB-2017-01-82-84 | 8/30/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142774-14 | SB-2017-01-98-100 | 8/31/2017 | Dissolved As, Fe, Mn | Groundwater |

Summary - Data validation was performed on the data for thirteen (13) groundwater profile samples and one (1) field duplicate sample collected from capture zone locations on 8/30, 8/31 and 9/1/2017 during drilling activities at Shepley's Hill. All samples were submitted for dissolved metals analyses by Method SW846/6010C for iron and manganese and Method SW846/6020A for arsenic. Samples were filtered in the field and preserved for sample shipment.

Sample Delivery and Condition – All samples arrived at the laboratory on 9/2/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample SB-2017-03-62-64 (Lab Sample ID: 680-142774-6) was logged in as SB-2017-03-62-44; the sample ID was corrected during data validation.

*Qualification:* None required

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the 6-month holding time required for preserved aqueous samples.

*Qualification:* None required

Laboratory Control Sample – The LCS recoveries for the reported target analytes met all %R control limits.

*Qualification:* None required.

MS/MSD – Matrix spike samples were not submitted with this sample set.

*Qualification:* None required.

Method Blank – The method blanks associated and analyzed with these samples were non-detect for all target analytes.

*Qualification:* None required.

Field Duplicate – Sample SB-2017-DUP-06 (Lab Sample ID: 680-142774-7) was the field duplicate sample of SB-2017-03-62-64 (Lab Sample ID: 680-142774-6). Detected results were comparable for all analytes with RPDs less than 10%. FD sample results are summarized in the table below.

| Lab Sample ID | 680-142774-6 | 680-142774-7 | |
|---|---|---|---|
| Client Sample ID | SB-2017-03-62-64 | SB-2017-0-DUP-06 | |
| Collection Date | 9/1/2017 | 9/1/2017 | |
| **Analyte** | **Result (µg/L)** | **Result (µg/L)** | **RPD (%)** |
| Iron | 8300 | 8200 | 1.2 |
| Manganese | 560 | 550 | 1.8 |
| Arsenic | 13 | 14 | 7.4 |

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "PQL U." Analyte detections below the PQL were reported as J qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table -** The dissolved metals results reported in this SDG are acceptable as reported. No qualifications were required and the data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value | Lab Qualifier | Validated Value | Validation Qualifier |
|---|---|---|---|---|---|---|
| 680-142774-1 | SB-2017-06-55-57A | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142774-2 | SB-2017-03-22-24 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142774-3 | SB-2017-03-32-34 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142774-4 | SB-2017-03-42-44 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142774-5 | SB-2017-03-52-54 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142774-6 | SB-2017-03-62-64 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142774-7 | SB-2017-0-DUP-06 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142774-8 | SB-2017-04-32-34 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142774-9 | SB-2017-04-42-44 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142774-10 | SB-2017-04-22-24 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142774-11 | SB-2017-01-92-94 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142774-12 | SB-2017-01-72-74 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142774-13 | SB-2017-01-82-84 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142774-14 | SB-2017-01-98-100 | Dissolved As, Fe, Mn | No qualifications needed. | | | |

**Miscellaneous Chemistry Parameters**
Alkalinity (SM2320B), Sulfate/Chloride (SW9056A) and Dissolved Organic Carbon (DOC) (SW9060)
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-142774-1 |
| Laboratory: Test America, Savannah, GA | Date: 09/21/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-142774-1 | SB-2017-06-55-57A | 8/31/2017 | Miscellaneous Parameters | Groundwater |
| 680-142774-2 | SB-2017-03-22-24 | 8/31/2017 | Miscellaneous Parameters | Groundwater |
| 680-142774-3 | SB-2017-03-32-34 | 8/31/2017 | Miscellaneous Parameters | Groundwater |
| 680-142774-4 | SB-2017-03-42-44 | 9/1/2017 | Miscellaneous Parameters | Groundwater |
| 680-142774-5 | SB-2017-03-52-54 | 9/1/2017 | Miscellaneous Parameters | Groundwater |
| 680-142774-6 | SB-2017-03-62-64 | 9/1/2017 | Miscellaneous Parameters | Groundwater |
| 680-142774-7 | SB-2017-0-DUP-06 | 9/1/2017 | Miscellaneous Parameters | Groundwater |
| 680-142774-8 | SB-2017-04-32-34 | 9/1/2017 | Miscellaneous Parameters | Groundwater |
| 680-142774-9 | SB-2017-04-42-44 | 9/1/2017 | Miscellaneous Parameters | Groundwater |
| 680-142774-10 | SB-2017-04-22-24 | 8/31/2017 | Miscellaneous Parameters | Groundwater |
| 680-142774-11 | SB-2017-01-92-94 | 8/31/2017 | Miscellaneous Parameters | Groundwater |
| 680-142774-12 | SB-2017-01-72-74 | 8/31/2017 | Miscellaneous Parameters | Groundwater |
| 680-142774-13 | SB-2017-01-82-84 | 8/30/2017 | Miscellaneous Parameters | Groundwater |
| 680-142774-14 | SB-2017-01-98-100 | 8/31/2017 | Miscellaneous Parameters | Groundwater |

Summary - Data validation was performed on the data for thirteen (13) groundwater profile samples and one (1) field duplicate sample collected from capture zone locations on 8/30, 8/31 and 9/01/2017 during drilling activities at Shepley's Hill. All samples were submitted for the miscellaneous wet chemistry analyses listed above. Samples submitted for dissolved organic carbon (DOC) analyses were field filtered. The samples submitted for alkalinity and DOC analyses were shipped to Test America Denver for analysis.

Sample Delivery and Condition – All samples arrived at the laboratory on 9/02/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample SB-2017-03-62-64 (Lab Sample ID: 680-142774-6) was logged in as SB-2017-03-62-44; the sample ID was corrected during data validation.

*Qualification:* None required.

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the respective holding times required for preserved aqueous samples.

*Qualification:* None required.

Method Blank –The method blanks for chloride and sulfate were free from contamination. Low level contamination was detected in the method blanks prepared and analyzed for alkalinity at 2.87 and 3.30 mg/L. All reported alkalinity sample results were greater than ten times the blank levels. DOC was reported in the method blank prepared and analyzed with these samples at 0.224 mg/L; the results for DOC in all but three samples were above five times the blank level.

*Qualification:* The low-level result for DOC in samples SB-2017-03-22-24, SB-2017-04-42-44 and SB-2017-04-22-24, (Lab Sample IDs: 680-142774-2, -9 and -10) were qualified as non-detect.

Laboratory Control Sample – The LCS %R results for all methods associated with these samples met the control limits.

*Qualification:* None required.

MS/MSD – MS/MSD samples were not submitted with this sample set.

*Qualification:* None required.

Field Duplicate – Sample SB-2017-DUP-06 (Lab Sample ID: 680-142774-7) was the field duplicate sample of SB-2017-03-62-64 (Lab Sample ID: 680-142774-6). Detected results were comparable for all analytes with RPDs less than 10%. FD sample results are summarized in the table below.

| Lab Sample ID | 680-142774-6 | 680-142774-7 | |
|---|---|---|---|
| Client Sample ID | SB-2017-03-62-64 | SB-2017-0-DUP-06 | |
| Collection Date | 9/1/2017 | 9/1/2017 | |
| **Analyte** | **Result (mg/L)** | **Result (mg/L)** | **RPD (%)** |
| Chloride | 17 | 17 | 0 |
| Sulfate | 3.3 | 3.3 | 0 |
| DOC | 3.1 | 3.0 | 3.3 |
| Alkalinity | 63 | 63 | 0 |

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "LOQ U." Analyte detections below the LOQ were reported as J-qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table** - The miscellaneous parameter results reported in this SDG are acceptable with the noted qualifications and the data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value (mg/L) | Lab Qualifier | Validated Value (mg/L) | Validation Qualifier |
|---|---|---|---|---|---|---|
| 680-142774-1 | SB-2017-06-55-57A | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142774-2 | SB-2017-03-22-24 | DOC | 1.1 | | 1.1 | U |
| 680-142774-3 | SB-2017-03-32-34 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142774-4 | SB-2017-03-42-44 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142774-5 | SB-2017-03-52-54 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142774-6 | SB-2017-03-62-64 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142774-7 | SB-2017-0-DUP-06 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142774-8 | SB-2017-04-32-34 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142774-9 | SB-2017-04-42-44 | DOC | 0.92 | J | 1.0 | U |
| 680-142774-10 | SB-2017-04-22-24 | DOC | 1.0 | | 1.0 | U |
| 680-142774-11 | SB-2017-01-92-94 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142774-12 | SB-2017-01-72-74 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142774-13 | SB-2017-01-82-84 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142774-14 | SB-2017-01-98-100 | Miscellaneous Parameters | No qualifications needed. | | | |

**SHL 2017 Drilling Validated Data - 142774**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142774-1 | SB-2017-06-55-57A | 8/31/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 39 | J | ug/L | 50 | 50 | 17 |
| 680-142774-1 | SB-2017-06-55-57A | 8/31/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 100 | | ug/L | 10 | 3 | 1 |
| 680-142774-1 | SB-2017-06-55-57A | 8/31/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3.6 | | ug/L | 3 | 3 | 1.5 |
| 680-142774-1 | SB-2017-06-55-57A | 8/31/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 2.3 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142774-1 | SB-2017-06-55-57A | 8/31/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 4.9 | | mg/L | 1 | 1 | 0.4 |
| 680-142774-1 | SB-2017-06-55-57A | 8/31/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142774-1 | SB-2017-06-55-57A | 8/31/2017 | SM 2320B | Total/NA | | Alkalinity | 42 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142774-2 | SB-2017-03-22-24 | 8/31/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 24 | J | ug/L | 50 | 50 | 17 |
| 680-142774-2 | SB-2017-03-22-24 | 8/31/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 24 | | ug/L | 10 | 3 | 1 |
| 680-142774-2 | SB-2017-03-22-24 | 8/31/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3 | U | ug/L | 3 | 3 | 1.5 |
| 680-142774-2 | SB-2017-03-22-24 | 8/31/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 2.7 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142774-2 | SB-2017-03-22-24 | 8/31/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.7 | | mg/L | 1 | 1 | 0.4 |
| 680-142774-2 | SB-2017-03-22-24 | 8/31/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.1 | U | mg/L | 1 | 0.5 | 0.16 |
| 680-142774-2 | SB-2017-03-22-24 | 8/31/2017 | SM 2320B | Total/NA | | Alkalinity | 37 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142774-3 | SB-2017-03-32-34 | 8/31/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 840 | | ug/L | 50 | 50 | 17 |
| 680-142774-3 | SB-2017-03-32-34 | 8/31/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 36 | | ug/L | 10 | 3 | 1 |
| 680-142774-3 | SB-2017-03-32-34 | 8/31/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 9.3 | | ug/L | 3 | 3 | 1.5 |
| 680-142774-3 | SB-2017-03-32-34 | 8/31/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 14 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142774-3 | SB-2017-03-32-34 | 8/31/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 14 | | mg/L | 1 | 1 | 0.4 |
| 680-142774-3 | SB-2017-03-32-34 | 8/31/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.9 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142774-3 | SB-2017-03-32-34 | 8/31/2017 | SM 2320B | Total/NA | | Alkalinity | 40 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142774-4 | SB-2017-03-42-44 | 9/1/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 5,200 | | ug/L | 50 | 50 | 17 |
| 680-142774-4 | SB-2017-03-42-44 | 9/1/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 300 | | ug/L | 10 | 3 | 1 |
| 680-142774-4 | SB-2017-03-42-44 | 9/1/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1.7 | J | ug/L | 3 | 3 | 1.5 |
| 680-142774-4 | SB-2017-03-42-44 | 9/1/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 37 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142774-4 | SB-2017-03-42-44 | 9/1/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 8.4 | | mg/L | 1 | 1 | 0.4 |
| 680-142774-4 | SB-2017-03-42-44 | 9/1/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.7 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142774-4 | SB-2017-03-42-44 | 9/1/2017 | SM 2320B | Total/NA | | Alkalinity | 41 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142774-5 | SB-2017-03-52-54 | 9/1/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 8,200 | | ug/L | 50 | 50 | 17 |
| 680-142774-5 | SB-2017-03-52-54 | 9/1/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 390 | | ug/L | 10 | 3 | 1 |
| 680-142774-5 | SB-2017-03-52-54 | 9/1/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 5.8 | | ug/L | 3 | 3 | 1.5 |
| 680-142774-5 | SB-2017-03-52-54 | 9/1/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 14 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142774-5 | SB-2017-03-52-54 | 9/1/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.7 | | mg/L | 1 | 1 | 0.4 |
| 680-142774-5 | SB-2017-03-52-54 | 9/1/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 4.1 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142774-5 | SB-2017-03-52-54 | 9/1/2017 | SM 2320B | Total/NA | | Alkalinity | 53 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142774-6 | SB-2017-03-62-64 | 9/1/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 8,300 | | ug/L | 50 | 50 | 17 |
| 680-142774-6 | SB-2017-03-62-64 | 9/1/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 560 | | ug/L | 10 | 3 | 1 |
| 680-142774-6 | SB-2017-03-62-64 | 9/1/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 13 | | ug/L | 3 | 3 | 1.5 |

**SHL 2017 Drilling Validated Data - 142774**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142774-6 | SB-2017-03-62-64 | 9/1/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 17 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142774-6 | SB-2017-03-62-64 | 9/1/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.3 | | mg/L | 1 | 1 | 0.4 |
| 680-142774-6 | SB-2017-03-62-64 | 9/1/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.1 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142774-6 | SB-2017-03-62-64 | 9/1/2017 | SM 2320B | Total/NA | | Alkalinity | 63 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142774-7 | SB-2017-0-DUP-06 | 9/1/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 8,200 | | ug/L | 50 | 50 | 17 |
| 680-142774-7 | SB-2017-0-DUP-06 | 9/1/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 550 | | ug/L | 10 | 3 | 1 |
| 680-142774-7 | SB-2017-0-DUP-06 | 9/1/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 14 | | ug/L | 3 | 3 | 1.5 |
| 680-142774-7 | SB-2017-0-DUP-06 | 9/1/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 17 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142774-7 | SB-2017-0-DUP-06 | 9/1/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.3 | | mg/L | 1 | 1 | 0.4 |
| 680-142774-7 | SB-2017-0-DUP-06 | 9/1/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142774-7 | SB-2017-0-DUP-06 | 9/1/2017 | SM 2320B | Total/NA | | Alkalinity | 63 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142774-8 | SB-2017-04-32-34 | 9/1/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 50 | U | ug/L | 50 | 50 | 17 |
| 680-142774-8 | SB-2017-04-32-34 | 9/1/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 26 | | ug/L | 10 | 3 | 1 |
| 680-142774-8 | SB-2017-04-32-34 | 9/1/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 2.7 | J | ug/L | 3 | 3 | 1.5 |
| 680-142774-8 | SB-2017-04-32-34 | 9/1/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 1.1 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142774-8 | SB-2017-04-32-34 | 9/1/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.8 | | mg/L | 1 | 1 | 0.4 |
| 680-142774-8 | SB-2017-04-32-34 | 9/1/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.5 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142774-8 | SB-2017-04-32-34 | 9/1/2017 | SM 2320B | Total/NA | | Alkalinity | 30 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142774-9 | SB-2017-04-42-44 | 9/1/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 3,200 | | ug/L | 50 | 50 | 17 |
| 680-142774-9 | SB-2017-04-42-44 | 9/1/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 390 | | ug/L | 10 | 3 | 1 |
| 680-142774-9 | SB-2017-04-42-44 | 9/1/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3 | U | ug/L | 3 | 3 | 1.5 |
| 680-142774-9 | SB-2017-04-42-44 | 9/1/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 11 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142774-9 | SB-2017-04-42-44 | 9/1/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 1.6 | | mg/L | 1 | 1 | 0.4 |
| 680-142774-9 | SB-2017-04-42-44 | 9/1/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.0 | U | mg/L | 1 | 0.5 | 0.16 |
| 680-142774-9 | SB-2017-04-42-44 | 9/1/2017 | SM 2320B | Total/NA | | Alkalinity | 36 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142774-10 | SB-2017-04-22-24 | 8/31/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 43 | J | ug/L | 50 | 50 | 17 |
| 680-142774-10 | SB-2017-04-22-24 | 8/31/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 25 | | ug/L | 10 | 3 | 1 |
| 680-142774-10 | SB-2017-04-22-24 | 8/31/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1.9 | J | ug/L | 3 | 3 | 1.5 |
| 680-142774-10 | SB-2017-04-22-24 | 8/31/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 2.7 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142774-10 | SB-2017-04-22-24 | 8/31/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.4 | | mg/L | 1 | 1 | 0.4 |
| 680-142774-10 | SB-2017-04-22-24 | 8/31/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.0 | U | mg/L | 1 | 0.5 | 0.16 |
| 680-142774-10 | SB-2017-04-22-24 | 8/31/2017 | SM 2320B | Total/NA | | Alkalinity | 9.9 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142774-11 | SB-2017-01-92-94 | 8/31/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 26,000 | | ug/L | 50 | 50 | 17 |
| 680-142774-11 | SB-2017-01-92-94 | 8/31/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 7,700 | | ug/L | 10 | 3 | 1 |
| 680-142774-11 | SB-2017-01-92-94 | 8/31/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 2,100 | | ug/L | 3 | 3 | 1.5 |
| 680-142774-11 | SB-2017-01-92-94 | 8/31/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 11 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142774-11 | SB-2017-01-92-94 | 8/31/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 6.3 | | mg/L | 1 | 1 | 0.4 |
| 680-142774-11 | SB-2017-01-92-94 | 8/31/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.6 | | mg/L | 1 | 0.5 | 0.16 |

**SHL 2017 Drilling Validated Data - 142774**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142774-11 | SB-2017-01-92-94 | 8/31/2017 | SM 2320B | Total/NA | | Alkalinity | 280 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142774-12 | SB-2017-01-72-74 | 8/31/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 13,000 | | ug/L | 50 | 50 | 17 |
| 680-142774-12 | SB-2017-01-72-74 | 8/31/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 730 | | ug/L | 10 | 3 | 1 |
| 680-142774-12 | SB-2017-01-72-74 | 8/31/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 26 | | ug/L | 3 | 3 | 1.5 |
| 680-142774-12 | SB-2017-01-72-74 | 8/31/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 17 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142774-12 | SB-2017-01-72-74 | 8/31/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 6.7 | | mg/L | 1 | 1 | 0.4 |
| 680-142774-12 | SB-2017-01-72-74 | 8/31/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.5 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142774-12 | SB-2017-01-72-74 | 8/31/2017 | SM 2320B | Total/NA | | Alkalinity | 63 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142774-13 | SB-2017-01-82-84 | 8/30/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 55,000 | | ug/L | 50 | 50 | 17 |
| 680-142774-13 | SB-2017-01-82-84 | 8/30/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,600 | | ug/L | 10 | 3 | 1 |
| 680-142774-13 | SB-2017-01-82-84 | 8/30/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 280 | | ug/L | 3 | 3 | 1.5 |
| 680-142774-13 | SB-2017-01-82-84 | 8/30/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 10 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142774-13 | SB-2017-01-82-84 | 8/30/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 10 | | mg/L | 1 | 1 | 0.4 |
| 680-142774-13 | SB-2017-01-82-84 | 8/30/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 6.5 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142774-13 | SB-2017-01-82-84 | 8/30/2017 | SM 2320B | Total/NA | | Alkalinity | 220 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142774-14 | SB-2017-01-98-100 | 8/31/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 37,000 | | ug/L | 50 | 50 | 17 |
| 680-142774-14 | SB-2017-01-98-100 | 8/31/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 7,100 | | ug/L | 10 | 3 | 1 |
| 680-142774-14 | SB-2017-01-98-100 | 8/31/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3,100 | | ug/L | 3 | 3 | 1.5 |
| 680-142774-14 | SB-2017-01-98-100 | 8/31/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 11 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142774-14 | SB-2017-01-98-100 | 8/31/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 6.1 | | mg/L | 1 | 1 | 0.4 |
| 680-142774-14 | SB-2017-01-98-100 | 8/31/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 4.4 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142774-14 | SB-2017-01-98-100 | 8/31/2017 | SM 2320B | Total/NA | | Alkalinity | 270 | | mg/L | 5 | 3.2 | 1.1 |

Notes:

mg/l = milligram per liter

µg/L = microgram per liter

LOQ = Limit of Quantitation

LOD = Limit of Detection

DL = Method Detection Limit

Qualifed Result

**Dissolved Metals**
SW 846/6010C/6020A
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-142881-1 |
| Laboratory: Test America, Savannah, GA | Date: 09/22/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-142881-1 | SB-2017-04-52-54 | 9/1/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142881-2 | SB-2017-03-72-74 | 9/1/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142881-3 | SB-2017-04-62-64 | 9/5/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142881-4 | SB-2017-04-72-74 | 9/5/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142881-5 | SB-2017-03-82-84 | 9/5/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142881-6 | SB-2017-04-82-84 | 9/5/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142881-7 | SB-2017-03-92-94 | 9/5/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142881-8 | SB-2017-04-92-94 | 9/5/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142881-9 | SB-2017-03-102-104 | 9/5/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142881-10 | SB-2017-04-102-104 | 9/6/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142881-11 | SB-2017-04-108-110 | 9/6/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142881-12 | SB-2017-02-22-24 | 9/6/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142881-13 | FD-07 | 9/6/2017 | Dissolved As, Fe, Mn | Groundwater |

Summary - Data validation was performed on the data for twelve (12) groundwater profile samples and one (1) field duplicate sample collected from capture zone locations on 9/1, 9/5 and 9/6/2017 during drilling activities at Shepley's Hill. All samples were submitted for dissolved metals analyses by Method SW846/6010C for iron and manganese and Method SW846/6020A for arsenic. Samples were filtered in the field and preserved for sample shipment.

Sample Delivery and Condition – All samples arrived at the laboratory on 9/7/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the 6-month holding time required for preserved aqueous samples.

*Qualification:* None required

Laboratory Control Sample – The LCS recoveries for the reported target analytes met all %R control limits.

*Qualification:* None required.

MS/MSD – Sample SB-2017-04-52-54 (Lab Sample ID: 680-142881-1) was spiked and analyzed as MS/MSD samples. The MSD %R and RPD for iron were above control limits. The %Rs and RPDs for the remaining analytes were within control limits.

*Qualification:* The result for iron in the spiked sample was qualified as estimated (J).

Method Blank – The method blanks associated and analyzed with these samples were non-detect for all target analytes.

*Qualification:* None required.

Field Duplicate – Sample FD-07 (Lab Sample ID: 680-142881-13) was the field duplicate sample of SB-2017-04-102-104 (Lab Sample ID: 680-142881-10). Detected results were comparable for all analytes with RPDs less than 20%. FD sample results are summarized in the table below.

| Lab Sample ID | 680-142881-10 | 680-142881-13 | |
|---|---|---|---|
| Client Sample ID | SB-2017-04-102-104 | FD-07 | |
| Collection Date | 9/6/2017 | 9/6/2017 | |
| **Analyte** | **Result (µg/L)** | **Result (µg/L)** | **RPD (%)** |
| Iron | 40,000 | 37,000 | 7.8 |
| Manganese | 1,700 | 1,700 | 0 |
| Arsenic | 2,900 | 3,300 | 12.9 |

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "PQL U." Analyte detections below the PQL were reported as J qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table -** The dissolved metals results reported in this SDG are acceptable with the noted qualifications and the data may be used for its intended purpose.

| **Lab Sample ID** | **Client Sample ID** | **Analysis** | **Lab Value (µg/L)** | **Lab Qualifier** | **Validated Value** | **Validation Qualifier (µg/L)** |
|---|---|---|---|---|---|---|
| 680-142881-1 | SB-2017-04-52-54 | Dissolved Fe | 1,600 | J | 1,600 | J |
| 680-142881-2 | SB-2017-03-72-74 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142881-3 | SB-2017-04-62-64 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142881-4 | SB-2017-04-72-74 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142881-5 | SB-2017-03-82-84 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142881-6 | SB-2017-04-82-84 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142881-7 | SB-2017-03-92-94 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142881-8 | SB-2017-04-92-94 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142881-9 | SB-2017-03-102-104 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142881-10 | SB-2017-04-102-104 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142881-11 | SB-2017-04-108-110 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142881-12 | SB-2017-02-22-24 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142881-13 | FD-07 | Dissolved As, Fe, Mn | No qualifications needed. | | | |

**Miscellaneous Chemistry Parameters**
Alkalinity (SM2320B), Sulfate/Chloride (SW9056A) and Dissolved Organic Carbon (DOC) (SW9060)
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-142881-1 |
| Laboratory: Test America, Savannah, GA | Date: 09/22/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-142881-1 | SB-2017-04-52-54 | 9/1/2017 | Miscellaneous Parameters | Groundwater |
| 680-142881-2 | SB-2017-03-72-74 | 9/1/2017 | Miscellaneous Parameters | Groundwater |
| 680-142881-3 | SB-2017-04-62-64 | 9/5/2017 | Miscellaneous Parameters | Groundwater |
| 680-142881-4 | SB-2017-04-72-74 | 9/5/2017 | Miscellaneous Parameters | Groundwater |
| 680-142881-5 | SB-2017-03-82-84 | 9/5/2017 | Miscellaneous Parameters | Groundwater |
| 680-142881-6 | SB-2017-04-82-84 | 9/5/2017 | Miscellaneous Parameters | Groundwater |
| 680-142881-7 | SB-2017-03-92-94 | 9/5/2017 | Miscellaneous Parameters | Groundwater |
| 680-142881-8 | SB-2017-04-92-94 | 9/5/2017 | Miscellaneous Parameters | Groundwater |
| 680-142881-9 | SB-2017-03-102-104 | 9/5/2017 | Miscellaneous Parameters | Groundwater |
| 680-142881-10 | SB-2017-04-102-104 | 9/6/2017 | Miscellaneous Parameters | Groundwater |
| 680-142881-11 | SB-2017-04-108-110 | 9/6/2017 | Miscellaneous Parameters | Groundwater |
| 680-142881-12 | SB-2017-02-22-24 | 9/6/2017 | Miscellaneous Parameters | Groundwater |
| 680-142881-13 | FD-07 | 9/6/2017 | Miscellaneous Parameters | Groundwater |

Summary - Data validation was performed on the data for twelve (12) groundwater profile samples and one (1) field duplicate sample collected from capture zone locations on 9/1, 9/5 and 9/06/2017 during drilling activities at Shepley's Hill. All samples were submitted for the miscellaneous wet chemistry analyses listed above. Samples submitted for dissolved organic carbon (DOC) analyses were field filtered. The samples submitted for alkalinity and DOC analyses were shipped to Test America Denver for analysis.

Sample Delivery and Condition – All samples arrived at the laboratory on 9/07/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required.

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the respective holding times required for

preserved aqueous samples.

*Qualification:* None required.

Method Blank –The method blanks for DOC, chloride and sulfate were free from contamination. Low level contamination was detected in the method blanks prepared and analyzed for alkalinity at 2.85 and 3.18 mg/L. All reported alkalinity sample results were greater than ten times the blank levels.

*Qualification:* None required.

Laboratory Control Sample – The LCS %R results for all methods associated with these samples met the control limits.

*Qualification:* None required.

MS/MSD – Sample SB-2017-04-52-54 (Lab Sample ID: 680-142881-1) was spiked and analyzed as MS/MSD samples for DOC, chloride and sulfate. All %Rs and RPDs for the spiked analytes were within control limits.

*Qualification:* None required.

Field Duplicate – Sample FD-07 (Lab Sample ID: 680-142881-13) was the field duplicate sample of SB-2017-04-102-104 (Lab Sample ID: 680-142881-10). Detected results were comparable for all analytes with RPDs less than 10%. FD sample results are summarized in the table below.

| Lab Sample ID | 680-142881-10 | 680-142881-13 | |
|---|---|---|---|
| Client Sample ID | SB-2017-04-102-104 | FD-07 | |
| Collection Date | 9/6/2017 | 9/6/2017 | |
| **Analyte** | **Result (mg/L)** | **Result (mg/L)** | **RPD (%)** |
| Chloride | 17 | 17 | 0 |
| Sulfate | 3.0 J | 3.1 J | 3.3 |
| DOC | 2.6 | 2.5 | 3.9 |
| Alkalinity | 290 | 280 | 3.5 |

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as “ND”; these results should be considered the equivalent of “LOQ U.” Analyte detections below the LOQ were reported as J- qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**<u>Qualification Summary Table</u>** - The miscellaneous parameter results reported in this SDG are acceptable as reported. The data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value | Lab Qualifier | Validated Value | Validation Qualifier |
|---|---|---|---|---|---|---|
| 680-142881-1 | SB-2017-04-52-54 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142881-2 | SB-2017-03-72-74 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142881-3 | SB-2017-04-62-64 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142881-4 | SB-2017-04-72-74 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142881-5 | SB-2017-03-82-84 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142881-6 | SB-2017-04-82-84 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142881-7 | SB-2017-03-92-94 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142881-8 | SB-2017-04-92-94 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142881-9 | SB-2017-03-102-104 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142881-10 | SB-2017-04-102-104 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142881-11 | SB-2017-04-108-110 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142881-12 | SB-2017-02-22-24 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142881-13 | FD-07 | Miscellaneous Parameters | No qualifications needed. | | | |

**SHL 2017 Drilling Validated Data - 142881**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142881-1 | SB-2017-04-52-54 | 9/1/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 1,600 | J | ug/L | 100 | 85 | 22 |
| 680-142881-1 | SB-2017-04-52-54 | 9/1/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 300 | | ug/L | 10 | 1 | 0.26 |
| 680-142881-1 | SB-2017-04-52-54 | 9/1/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1.8 | J | ug/L | 5 | 1 | 0.33 |
| 680-142881-1 | SB-2017-04-52-54 | 9/1/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 3 | | mg/L | 3 | 0.5 | 0.25 |
| 680-142881-1 | SB-2017-04-52-54 | 9/1/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.6 | J | mg/L | 5 | 0.5 | 0.23 |
| 680-142881-1 | SB-2017-04-52-54 | 9/1/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.6 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142881-1 | SB-2017-04-52-54 | 9/1/2017 | SM 2320B | Total/NA | | Alkalinity | 45 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142881-2 | SB-2017-03-72-74 | 9/1/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 21,000 | | ug/L | 100 | 85 | 22 |
| 680-142881-2 | SB-2017-03-72-74 | 9/1/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,100 | | ug/L | 10 | 1 | 0.26 |
| 680-142881-2 | SB-2017-03-72-74 | 9/1/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 86 | | ug/L | 5 | 1 | 0.33 |
| 680-142881-2 | SB-2017-03-72-74 | 9/1/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 4.7 | | mg/L | 3 | 0.5 | 0.25 |
| 680-142881-2 | SB-2017-03-72-74 | 9/1/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 6 | | mg/L | 5 | 0.5 | 0.23 |
| 680-142881-2 | SB-2017-03-72-74 | 9/1/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.6 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142881-2 | SB-2017-03-72-74 | 9/1/2017 | SM 2320B | Total/NA | | Alkalinity | 73 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142881-3 | SB-2017-04-62-64 | 9/5/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 5,400 | | ug/L | 100 | 85 | 22 |
| 680-142881-3 | SB-2017-04-62-64 | 9/5/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 320 | | ug/L | 10 | 1 | 0.26 |
| 680-142881-3 | SB-2017-04-62-64 | 9/5/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 10 | | ug/L | 5 | 1 | 0.33 |
| 680-142881-3 | SB-2017-04-62-64 | 9/5/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 16 | | mg/L | 3 | 0.5 | 0.25 |
| 680-142881-3 | SB-2017-04-62-64 | 9/5/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.5 | J | mg/L | 5 | 0.5 | 0.23 |
| 680-142881-3 | SB-2017-04-62-64 | 9/5/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.2 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142881-3 | SB-2017-04-62-64 | 9/5/2017 | SM 2320B | Total/NA | | Alkalinity | 57 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142881-4 | SB-2017-04-72-74 | 9/5/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 18,000 | | ug/L | 100 | 85 | 22 |
| 680-142881-4 | SB-2017-04-72-74 | 9/5/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 860 | | ug/L | 10 | 1 | 0.26 |
| 680-142881-4 | SB-2017-04-72-74 | 9/5/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 38 | | ug/L | 5 | 1 | 0.33 |
| 680-142881-4 | SB-2017-04-72-74 | 9/5/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 23 | | mg/L | 3 | 0.5 | 0.25 |
| 680-142881-4 | SB-2017-04-72-74 | 9/5/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 6.6 | | mg/L | 5 | 0.5 | 0.23 |
| 680-142881-4 | SB-2017-04-72-74 | 9/5/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142881-4 | SB-2017-04-72-74 | 9/5/2017 | SM 2320B | Total/NA | | Alkalinity | 48 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142881-5 | SB-2017-03-82-84 | 9/5/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 46,000 | | ug/L | 100 | 85 | 22 |
| 680-142881-5 | SB-2017-03-82-84 | 9/5/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 3,800 | | ug/L | 10 | 1 | 0.26 |
| 680-142881-5 | SB-2017-03-82-84 | 9/5/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 170 | | ug/L | 5 | 1 | 0.33 |
| 680-142881-5 | SB-2017-03-82-84 | 9/5/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 15 | | mg/L | 3 | 0.5 | 0.25 |
| 680-142881-5 | SB-2017-03-82-84 | 9/5/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.5 | J | mg/L | 5 | 0.5 | 0.23 |
| 680-142881-5 | SB-2017-03-82-84 | 9/5/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.8 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142881-5 | SB-2017-03-82-84 | 9/5/2017 | SM 2320B | Total/NA | | Alkalinity | 200 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142881-6 | SB-2017-04-82-84 | 9/5/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 22,000 | | ug/L | 100 | 85 | 22 |
| 680-142881-6 | SB-2017-04-82-84 | 9/5/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,000 | | ug/L | 10 | 1 | 0.26 |

**SHL 2017 Drilling Validated Data - 142881**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142881-6 | SB-2017-04-82-84 | 9/5/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 100 | | ug/L | 5 | 1 | 0.33 |
| 680-142881-6 | SB-2017-04-82-84 | 9/5/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 12 | | mg/L | 3 | 0.5 | 0.25 |
| 680-142881-6 | SB-2017-04-82-84 | 9/5/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 5.5 | | mg/L | 5 | 0.5 | 0.23 |
| 680-142881-6 | SB-2017-04-82-84 | 9/5/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.7 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142881-6 | SB-2017-04-82-84 | 9/5/2017 | SM 2320B | Total/NA | | Alkalinity | 53 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142881-7 | SB-2017-03-92-94 | 9/5/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 55,000 | | ug/L | 100 | 85 | 22 |
| 680-142881-7 | SB-2017-03-92-94 | 9/5/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 9,600 | | ug/L | 10 | 1 | 0.26 |
| 680-142881-7 | SB-2017-03-92-94 | 9/5/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 960 | | ug/L | 5 | 1 | 0.33 |
| 680-142881-7 | SB-2017-03-92-94 | 9/5/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 21 | | mg/L | 3 | 0.5 | 0.25 |
| 680-142881-7 | SB-2017-03-92-94 | 9/5/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.1 | J | mg/L | 5 | 0.5 | 0.23 |
| 680-142881-7 | SB-2017-03-92-94 | 9/5/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.2 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142881-7 | SB-2017-03-92-94 | 9/5/2017 | SM 2320B | Total/NA | | Alkalinity | 270 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142881-8 | SB-2017-04-92-94 | 9/5/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 55,000 | | ug/L | 100 | 85 | 22 |
| 680-142881-8 | SB-2017-04-92-94 | 9/5/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 3,700 | | ug/L | 10 | 1 | 0.26 |
| 680-142881-8 | SB-2017-04-92-94 | 9/5/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1,200 | | ug/L | 5 | 1 | 0.33 |
| 680-142881-8 | SB-2017-04-92-94 | 9/5/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 18 | | mg/L | 3 | 0.5 | 0.25 |
| 680-142881-8 | SB-2017-04-92-94 | 9/5/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.6 | J | mg/L | 5 | 0.5 | 0.23 |
| 680-142881-8 | SB-2017-04-92-94 | 9/5/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.2 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142881-8 | SB-2017-04-92-94 | 9/5/2017 | SM 2320B | Total/NA | | Alkalinity | 270 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142881-9 | SB-2017-03-102-104 | 9/5/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 9,100 | | ug/L | 100 | 85 | 22 |
| 680-142881-9 | SB-2017-03-102-104 | 9/5/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 9,900 | | ug/L | 10 | 1 | 0.26 |
| 680-142881-9 | SB-2017-03-102-104 | 9/5/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 5.7 | | ug/L | 5 | 1 | 0.33 |
| 680-142881-9 | SB-2017-03-102-104 | 9/5/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 19 | | mg/L | 3 | 0.5 | 0.25 |
| 680-142881-9 | SB-2017-03-102-104 | 9/5/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.6 | J | mg/L | 5 | 0.5 | 0.23 |
| 680-142881-9 | SB-2017-03-102-104 | 9/5/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142881-9 | SB-2017-03-102-104 | 9/5/2017 | SM 2320B | Total/NA | | Alkalinity | 300 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142881-10 | SB-2017-04-102-104 | 9/6/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 40,000 | | ug/L | 100 | 85 | 22 |
| 680-142881-10 | SB-2017-04-102-104 | 9/6/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,700 | | ug/L | 10 | 1 | 0.26 |
| 680-142881-10 | SB-2017-04-102-104 | 9/6/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 2,900 | | ug/L | 5 | 1 | 0.33 |
| 680-142881-10 | SB-2017-04-102-104 | 9/6/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 17 | | mg/L | 3 | 0.5 | 0.25 |
| 680-142881-10 | SB-2017-04-102-104 | 9/6/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3 | J | mg/L | 5 | 0.5 | 0.23 |
| 680-142881-10 | SB-2017-04-102-104 | 9/6/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.6 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142881-10 | SB-2017-04-102-104 | 9/6/2017 | SM 2320B | Total/NA | | Alkalinity | 290 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142881-11 | SB-2017-04-108-110 | 9/6/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 30,000 | | ug/L | 100 | 85 | 22 |
| 680-142881-11 | SB-2017-04-108-110 | 9/6/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 5,300 | | ug/L | 10 | 1 | 0.26 |
| 680-142881-11 | SB-2017-04-108-110 | 9/6/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 800 | | ug/L | 5 | 1 | 0.33 |
| 680-142881-11 | SB-2017-04-108-110 | 9/6/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 17 | | mg/L | 3 | 0.5 | 0.25 |

**SHL 2017 Drilling Validated Data - 142881**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142881-11 | SB-2017-04-108-110 | 9/6/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.8 | J | mg/L | 5 | 0.5 | 0.23 |
| 680-142881-11 | SB-2017-04-108-110 | 9/6/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.5 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142881-11 | SB-2017-04-108-110 | 9/6/2017 | SM 2320B | Total/NA | | Alkalinity | 280 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142881-12 | SB-2017-02-22-24 | 9/6/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 25 | J | ug/L | 100 | 85 | 22 |
| 680-142881-12 | SB-2017-02-22-24 | 9/6/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1.8 | J | ug/L | 10 | 1 | 0.26 |
| 680-142881-12 | SB-2017-02-22-24 | 9/6/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 5.8 | | ug/L | 5 | 1 | 0.33 |
| 680-142881-12 | SB-2017-02-22-24 | 9/6/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 6.2 | | mg/L | 3 | 0.5 | 0.25 |
| 680-142881-12 | SB-2017-02-22-24 | 9/6/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 4.5 | J | mg/L | 5 | 0.5 | 0.23 |
| 680-142881-12 | SB-2017-02-22-24 | 9/6/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.5 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142881-12 | SB-2017-02-22-24 | 9/6/2017 | SM 2320B | Total/NA | | Alkalinity | 63 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142881-13 | FD-07 | 9/6/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 37,000 | | ug/L | 100 | 85 | 22 |
| 680-142881-13 | FD-07 | 9/6/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,700 | | ug/L | 10 | 1 | 0.26 |
| 680-142881-13 | FD-07 | 9/6/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3,300 | | ug/L | 5 | 1 | 0.33 |
| 680-142881-13 | FD-07 | 9/6/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 17 | | mg/L | 3 | 0.5 | 0.25 |
| 680-142881-13 | FD-07 | 9/6/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.1 | J | mg/L | 5 | 0.5 | 0.23 |
| 680-142881-13 | FD-07 | 9/6/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.5 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142881-13 | FD-07 | 9/6/2017 | SM 2320B | Total/NA | | Alkalinity | 280 | | mg/L | 5 | 3.2 | 1.1 |

Qualifed Result

Notes:

mg/l = milligram per liter

µg/L = microgram per liter

LOQ = Limit of Quantitation

LOD = Limit of Detection

DL = Method Detection Limit

**Dissolved Metals**
SW 846/6010C/6020A
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-143024-1 |
| Laboratory: Test America, Savannah, GA | Date: 10/02/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-143024-1 | SB-2017-02-82-84 | 9/11/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-2 | SB-2017-05-82-84 | 9/11/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-3 | SB-2017-02-92-94 | 9/11/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-4 | SB-2017-02-102-1044 | 9/11/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-5 | SB-2017-05-92-94 | 9/11/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-6 | SB-2017-02-111-113 | 9/11/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-7 | FD-07 | 9/11/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-8 | SB-2017-05-102-104 | 9/11/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-9 | SB-2017-17-12-14 | 9/12/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-10 | SB-2017-17-22-24 | 9/12/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-11 | SB-2017-17-32-34 | 9/12/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-12 | SB-2017-17-42-44 | 9/12/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-13 | SB-2017-17-52-54 | 9/12/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-14 | SB-2017-05-112-114 | 9/12/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-15 | SB-2017-18-12-14 | 9/12/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-16 | SB-2017-18-22-24 | 9/12/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-17 | SB-2017-18-32-34 | 9/12/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-18 | SB-2017-18-42-44 | 9/12/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-19 | FD-08 | 9/12/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-20 | SB-2017-18-52-54 | 9/13/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-21 | SB-2017-17-62-64 | 9/13/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-22 | SB-2017-17-72-74 | 9/13/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-23 | SB-2017-18-62-64 | 9/13/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-24 | SB-2017-17-78-80 | 9/13/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-25 | SB-2017-18-72-74 | 9/13/2017 | Dissolved As, Fe and Mn | Groundwater |
| 680-143024-26 | SB-2017-16-22-24 | 9/13/2017 | Dissolved As, Fe and Mn | Groundwater |

Summary - Data validation was performed on the data for twenty-four (24) groundwater profile samples and two (2) field duplicate samples collected from the downgradient and capture zone locations on 9/11, 9/12 and 9/13/2017 during drilling activities at Shepley's Hill. All samples were submitted for dissolved metals analyses by Method SW846/6010C for iron and manganese and Method SW846/6020A for arsenic. Samples were filtered in the field and preserved for sample shipment.

Sample Delivery and Condition – All samples arrived at the laboratory on 9/14/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the 6-month holding time required for preserved aqueous samples.

*Qualification:* None required

Laboratory Control Sample – The LCS recoveries for the reported target analytes met all %R control limits.

*Qualification:* None required.

MS/MSD – Sample SB-2017-17-62-64 (Lab Sample ID: 680-143024-21) was spiked and analyzed as MS/MSD samples. The MS/MSD %Rs for iron were outside control limits; the native sample results was greater than four (4) times the spike level. The MSD %R for manganese was below control limits. The %Rs and RPDs for arsenic were within control limits.

The laboratory selected sample SB-2017-05-102-104 (Lab Sample ID: 680-14324-8) to be spiked and analyzed as an additional MS/MSD. The native sample results were greater than four (4) times the spike level for all spiked analytes; %Rs could not be calculated and qualification were not needed.

*Qualification:* The result for manganese in the spiked sample SB-2017-17-62-64 (Lab Sample ID: 680-143024-21) was qualified as estimated (J).

Method Blank – The method blanks prepared and analyzed with these samples were non-detect for all target analytes.

*Qualification:* None required.

Field Duplicate – Two field duplicate samples were submitted with this sample set. Sample FD-07 (Lab Sample ID: 680-143024-7) was the field duplicate sample of SB-2017-02-82-84 (Lab Sample ID: 680-143024-1) and sample FD-08 (Lab Sample ID: 680-143024-19) was the field duplicate sample of SB-2017-18-32-43 (Lab Sample ID: 680-143024-17). The calculated RPD for arsenic in the FD sample pair SB-2017-02-82-84/FD-07 was 37%. The calculated RPD for iron in the FD sample pair SB-2017-02-82-84/FD-08 was 31%. Detected results were comparable for the remaining analytes with RPDs less than 10%. FD sample results are summarized in the table below.

| Lab Sample ID | 680-143024-1 | 680-143024-7 | |
|---|---|---|---|
| Client Sample ID | SB-2017-02-82-84 | FD-07 | |
| Collection Date | 9/11/2017 | 9/11/2017 | |
| Analyte | **Result (µg/L)** | **Result (µg/L)** | **RPD (%)** |
| Iron | 71,000 | 76,000 | 6.8 |
| Manganese | 3,700 | 3,800 | 2.7 |
| Arsenic | 190 | 130 | 37 |
| | 680-143024-17 | 680-143024-19 | |
| | SB-2017-18-32-34 | FD-08 | |
| | 9/12/2017 | 9/12/2017 | |
| | **Result (µg/L)** | **Result (µg/L)** | **RPD (%)** |
| Iron | 1,500 | 1,100 | 31 |
| Manganese | 1,100 | 1,100 | 0 |
| Arsenic | 3.0 U | 3.0 U | 0 |

*Qualification:* The results for arsenic in FD samples SB-2017-02-82-84 and FD-07 and the results for iron in FD samples SB-2017-02-82-84 and FD-08 were qualified as estimated (J).

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "PQL U." Analyte detections below the PQL were reported as J qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table -** The dissolved metals results reported in this SDG are acceptable with the noted qualifications and the data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value (µg/L) | Lab Qualifier | Validated Value | Validation Qualifier (µg/L) |
|---|---|---|---|---|---|---|
| 680-143024-1 | SB-2017-02-82-84 | Dissolved As | 190 | | 190 | J |
| 680-143024-2 | SB-2017-05-82-84 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-3 | SB-2017-02-92-94 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-4 | SB-2017-02-102-1044 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-5 | SB-2017-05-92-94 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-6 | SB-2017-02-111-113 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-7 | FD-07 | Dissolved As | 130 | | 130 | J |
| 680-143024-8 | SB-2017-05-102-104 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-9 | SB-2017-17-12-14 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-10 | SB-2017-17-22-24 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-11 | SB-2017-17-32-34 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-12 | SB-2017-17-42-44 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-13 | SB-2017-17-52-54 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-14 | SB-2017-05-112-114 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-15 | SB-2017-18-12-14 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-16 | SB-2017-18-22-24 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-17 | SB-2017-18-32-34 | Dissolved Fe | 1,500 | | 1,500 | J |
| 680-143024-18 | SB-2017-18-42-44 | Dissolved As, Fe and Mn | No qualifications needed. | | | |

| Lab Sample ID | Client Sample ID | Analysis | Lab Value (µg/L) | Lab Qualifier | Validated Value | Validation Qualifier (µg/L) |
|---|---|---|---|---|---|---|
| 680-143024-19 | FD-08 | Dissolved Fe | 1,100 | | 1,100 | J |
| 680-143024-20 | SB-2017-18-52-54 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-21 | SB-2017-17-62-64 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-22 | SB-2017-17-72-74 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-23 | SB-2017-18-62-64 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-24 | SB-2017-17-78-80 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-25 | SB-2017-18-72-74 | Dissolved As, Fe and Mn | No qualifications needed. | | | |
| 680-143024-26 | SB-2017-16-22-24 | Dissolved As, Fe and Mn | No qualifications needed. | | | |

**Miscellaneous Chemistry Parameters**
Alkalinity (SM2320B), Sulfate/Chloride (SW9056A), Dissolved Organic Carbon (DOC) (SW9060)
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-143024-1 |
| Laboratory: Test America, Savannah, GA | Date: 10/02/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-143024-1 | SB-2017-02-82-84 | 9/11/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-2 | SB-2017-05-82-84 | 9/11/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-3 | SB-2017-02-92-94 | 9/11/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-4 | SB-2017-02-102-104 | 9/11/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-5 | SB-2017-05-92-94 | 9/11/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-6 | SB-2017-02-111-113 | 9/11/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-7 | FD-07 | 9/11/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-8 | SB-2017-05-102-104 | 9/11/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-9 | SB-2017-17-12-14 | 9/12/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-10 | SB-2017-17-22-24 | 9/12/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-11 | SB-2017-17-32-34 | 9/12/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-12 | SB-2017-17-42-44 | 9/12/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-13 | SB-2017-17-52-54 | 9/12/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-14 | SB-2017-05-112-114 | 9/12/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-15 | SB-2017-18-12-14 | 9/12/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-16 | SB-2017-18-22-24 | 9/12/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-17 | SB-2017-18-32-34 | 9/12/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-18 | SB-2017-18-42-44 | 9/12/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-19 | FD-08 | 9/12/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-20 | SB-2017-18-52-54 | 9/13/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-21 | SB-2017-17-62-64 | 9/13/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-22 | SB-2017-17-72-74 | 9/13/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-23 | SB-2017-18-62-64 | 9/13/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-24 | SB-2017-17-78-80 | 9/13/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-25 | SB-2017-18-72-74 | 9/13/2017 | Miscellaneous Parameters | Groundwater |
| 680-143024-26 | SB-2017-16-22-24 | 9/13/2017 | Miscellaneous Parameters | Groundwater |

Summary - Data validation was performed on the data for twenty-four (24) groundwater profile samples and two (2) field duplicate samples collected from upgradient and capture zone locations on 9/11, 9/12 and 9/13/2017 during drilling activities at Shepley's Hill. All samples were submitted for

the miscellaneous wet chemistry analyses listed above. Samples submitted for dissolved organic carbon (DOC) analyses were field filtered. The samples submitted for alkalinity and DOC analyses were shipped to Test America Denver for analysis.

Sample Delivery and Condition – All samples arrived at the laboratory on 9/14/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required.

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the respective holding times required for preserved aqueous samples.

*Qualification:* None required.

Method Blank –The method blanks for DOC< chloride and sulfate were free from contamination. Low level contamination was detected in the method blanks prepared and analyzed for alkalinity ranging from 2.32 to 3.45 mg/L. The alkalinity results for the majority of samples were greater than ten times the blank levels.

*Qualification:* The low-level results for alkalinity (15 mg/L and 12 mg/L), less than ten times the blank levels were qualified, as non-detect in samples SB-2017-18-12-14 and SB-2017-18-22-24 (Lab Sample IDs: 680-143024-15 and -16).

Laboratory Control Sample – The LCS %R results for all methods associated with these samples met the control limits.

*Qualification:* None required.

MS/MSD – Sample SB-2017-17-62-64 (Lab Sample ID: 680-143024-21) was spiked and analyzed as MS/MSD samples for chloride, sulfate and DOC. The %Rs and RPDs were with control limits for all spiked analytes.

*Qualification:* None required.

Field Duplicate – Two field duplicate samples were submitted with this sample set. Sample FD-07 (Lab Sample ID: 680-143024-7) was the field duplicate sample of SB-2017-02-82-84 (Lab Sample ID: 680-143024-1) and sample FD-08 (Lab Sample ID: 680-143024-19) was the field duplicate sample of SB-2017-18-32-43 (Lab Sample ID: 680-143024-17). Detected results were comparable for all analytes with RPDs less than 20% with the exception of DOC in the FD sample pair SB-2017-02-82-84/FD-08, which had a %RPD of 69%. This discrepancy is likely due to the low level DOC results.

FD sample results are summarized in the table below.

| Lab Sample ID | 680-143024-1 | 680-143024-7 | |
|---|---|---|---|
| Client Sample ID | SB-2017-02-82-84 | FD-07 | |
| Collection Date | 9/11/2017 | 9/11/2017 | |
| | **Result (mg/L)** | **Result (mg/L)** | **RPD (%)** |
| Chloride | 18 | 18 | 0 |
| Sulfate | 1.6 | 1.9 | 17 |
| DOC | 2.7 | 2.5 | 7.7 |
| Alkalinity | 210 | 210 | 0 |
| | 680-143024-17 | 680-143024-19 | |
| | SB-2017-18-32-34 | FD-08 | |
| | 9/12/2017 | 9/12/2017 | |
| | **Result (mg/L)** | **Result (mg/L)** | **RPD (%)** |
| Chloride | 4.6 | 4.4 | 4.6 |
| Sulfate | 11 | 11 | 0 |
| DOC | 1.4 | 0.68 | 69 |
| Alkalinity | 27 | 26 | 3.8 |

*Qualification:* The DOC results in the FD sample pair SB-2017-02-82-84 and FD-08 were qualified as estimated (J).

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "LOQ U." Analyte detections below the LOQ were reported as J-qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table** - The miscellaneous parameter results reported in this SDG are acceptable with the noted qualifications and the data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value (mg/L) | Lab Qualifier | Validated Value | Validation Qualifier (mg/L) |
|---|---|---|---|---|---|---|
| 680-143024-1 | SB-2017-02-82-84 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-2 | SB-2017-05-82-84 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-3 | SB-2017-02-92-94 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-4 | SB-2017-02-102-1044 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-5 | SB-2017-05-92-94 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-6 | SB-2017-02-111-113 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-7 | FD-07 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-8 | SB-2017-05-102-104 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-9 | SB-2017-17-12-14 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-10 | SB-2017-17-22-24 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-11 | SB-2017-17-32-34 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-12 | SB-2017-17-42-44 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-13 | SB-2017-17-52-54 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-14 | SB-2017-05-112-114 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-15 | SB-2017-18-12-14 | Alkalinity | 15 | B | 15 | U |

| Lab Sample ID | Client Sample ID | Analysis | Lab Value (mg/L) | Lab Qualifier | Validated Value | Validation Qualifier (mg/L) |
|---|---|---|---|---|---|---|
| 680-143024-16 | SB-2017-18-22-24 | Alkalinity | 12 | B | 12 | U |
| 680-143024-17 | SB-2017-18-32-34 | DOC | 1.4 | | 1.4 | J |
| 680-143024-18 | SB-2017-18-42-44 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-19 | FD-08 | DOC | 0.68 | J | 0.68 | J |
| 680-143024-20 | SB-2017-18-52-54 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-21 | SB-2017-17-62-64 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-22 | SB-2017-17-72-74 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-23 | SB-2017-18-62-64 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-24 | SB-2017-17-78-80 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-25 | SB-2017-18-72-74 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143024-26 | SB-2017-16-22-24 | Miscellaneous Parameters | No qualifications needed. | | | |

**SHL 2017 Drilling Validated Data - 143024**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-143024-1 | SB-2017-02-82-84 | 9/11/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 71,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-1 | SB-2017-02-82-84 | 9/11/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 3,700 | | ug/L | 10 | 3 | 1 |
| 680-143024-1 | SB-2017-02-82-84 | 9/11/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 190 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-1 | SB-2017-02-82-84 | 9/11/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 18 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-1 | SB-2017-02-82-84 | 9/11/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 1.6 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-1 | SB-2017-02-82-84 | 9/11/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.7 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-1 | SB-2017-02-82-84 | 9/11/2017 | SM 2320B | Total/NA | | Alkalinity | 210 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-2 | SB-2017-05-82-84 | 9/11/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 52,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-2 | SB-2017-05-82-84 | 9/11/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 3,100 | | ug/L | 10 | 3 | 1 |
| 680-143024-2 | SB-2017-05-82-84 | 9/11/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 260 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-2 | SB-2017-05-82-84 | 9/11/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 14 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-2 | SB-2017-05-82-84 | 9/11/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.8 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-2 | SB-2017-05-82-84 | 9/11/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.7 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-2 | SB-2017-05-82-84 | 9/11/2017 | SM 2320B | Total/NA | | Alkalinity | 170 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-3 | SB-2017-02-92-94 | 9/11/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 63,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-3 | SB-2017-02-92-94 | 9/11/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 3,800 | | ug/L | 10 | 3 | 1 |
| 680-143024-3 | SB-2017-02-92-94 | 9/11/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1,800 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-3 | SB-2017-02-92-94 | 9/11/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 19 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-3 | SB-2017-02-92-94 | 9/11/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 1.8 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-3 | SB-2017-02-92-94 | 9/11/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-3 | SB-2017-02-92-94 | 9/11/2017 | SM 2320B | Total/NA | | Alkalinity | 260 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-4 | SB-2017-02-102-104 | 9/11/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 65,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-4 | SB-2017-02-102-104 | 9/11/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 8,900 | | ug/L | 10 | 3 | 1 |
| 680-143024-4 | SB-2017-02-102-104 | 9/11/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 2,400 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-4 | SB-2017-02-102-104 | 9/11/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 18 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-4 | SB-2017-02-102-104 | 9/11/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.2 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-4 | SB-2017-02-102-104 | 9/11/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.7 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-4 | SB-2017-02-102-104 | 9/11/2017 | SM 2320B | Total/NA | | Alkalinity | 280 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-5 | SB-2017-05-92-94 | 9/11/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 64,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-5 | SB-2017-05-92-94 | 9/11/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 3,600 | | ug/L | 10 | 3 | 1 |
| 680-143024-5 | SB-2017-05-92-94 | 9/11/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 2,500 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-5 | SB-2017-05-92-94 | 9/11/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 19 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-5 | SB-2017-05-92-94 | 9/11/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 4.8 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-5 | SB-2017-05-92-94 | 9/11/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.5 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-5 | SB-2017-05-92-94 | 9/11/2017 | SM 2320B | Total/NA | | Alkalinity | 250 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-6 | SB-2017-02-111-113 | 9/11/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 53,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-6 | SB-2017-02-111-113 | 9/11/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 5,200 | | ug/L | 10 | 3 | 1 |
| 680-143024-6 | SB-2017-02-111-113 | 9/11/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 800 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-6 | SB-2017-02-111-113 | 9/11/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 18 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-6 | SB-2017-02-111-113 | 9/11/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.2 | | mg/L | 1 | 1 | 0.4 |

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-143024-6 | SB-2017-02-111-113 | 9/11/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.6 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-6 | SB-2017-02-111-113 | 9/11/2017 | SM 2320B | Total/NA | | Alkalinity | 270 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-7 | FD-07 | 9/11/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 76,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-7 | FD-07 | 9/11/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 3,800 | | ug/L | 10 | 3 | 1 |
| 680-143024-7 | FD-07 | 9/11/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 130 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-7 | FD-07 | 9/11/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 18 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-7 | FD-07 | 9/11/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 1.9 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-7 | FD-07 | 9/11/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.5 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-7 | FD-07 | 9/11/2017 | SM 2320B | Total/NA | | Alkalinity | 210 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-8 | SB-2017-05-102-104 | 9/11/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 70,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-8 | SB-2017-05-102-104 | 9/11/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 7,500 | | ug/L | 10 | 3 | 1 |
| 680-143024-8 | SB-2017-05-102-104 | 9/11/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 630 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-8 | SB-2017-05-102-104 | 9/11/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 17 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-8 | SB-2017-05-102-104 | 9/11/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.4 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-8 | SB-2017-05-102-104 | 9/11/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.4 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-8 | SB-2017-05-102-104 | 9/11/2017 | SM 2320B | Total/NA | | Alkalinity | 250 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-9 | SB-2017-17-12-14 | 9/12/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 4,800 | | ug/L | 50 | 50 | 17 |
| 680-143024-9 | SB-2017-17-12-14 | 9/12/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,600 | | ug/L | 10 | 3 | 1 |
| 680-143024-9 | SB-2017-17-12-14 | 9/12/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3 | U | ug/L | 3 | 3 | 1.5 |
| 680-143024-9 | SB-2017-17-12-14 | 9/12/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 13 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-9 | SB-2017-17-12-14 | 9/12/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 8.2 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-9 | SB-2017-17-12-14 | 9/12/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.6 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-9 | SB-2017-17-12-14 | 9/12/2017 | SM 2320B | Total/NA | | Alkalinity | 23 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-10 | SB-2017-17-22-24 | 9/12/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 1,600 | | ug/L | 50 | 50 | 17 |
| 680-143024-10 | SB-2017-17-22-24 | 9/12/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 420 | | ug/L | 10 | 3 | 1 |
| 680-143024-10 | SB-2017-17-22-24 | 9/12/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3 | U | ug/L | 3 | 3 | 1.5 |
| 680-143024-10 | SB-2017-17-22-24 | 9/12/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 7.8 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-10 | SB-2017-17-22-24 | 9/12/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 10 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-10 | SB-2017-17-22-24 | 9/12/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 0.46 | J | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-10 | SB-2017-17-22-24 | 9/12/2017 | SM 2320B | Total/NA | | Alkalinity | 35 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-11 | SB-2017-17-32-34 | 9/12/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 2,600 | | ug/L | 50 | 50 | 17 |
| 680-143024-11 | SB-2017-17-32-34 | 9/12/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 660 | | ug/L | 10 | 3 | 1 |
| 680-143024-11 | SB-2017-17-32-34 | 9/12/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3 | U | ug/L | 3 | 3 | 1.5 |
| 680-143024-11 | SB-2017-17-32-34 | 9/12/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 420 | | mg/L | 5 | 5 | 2 |
| 680-143024-11 | SB-2017-17-32-34 | 9/12/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 5.6 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-11 | SB-2017-17-32-34 | 9/12/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 0.71 | J | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-11 | SB-2017-17-32-34 | 9/12/2017 | SM 2320B | Total/NA | | Alkalinity | 29 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-12 | SB-2017-17-42-44 | 9/12/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 3,900 | | ug/L | 50 | 50 | 17 |
| 680-143024-12 | SB-2017-17-42-44 | 9/12/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 710 | | ug/L | 10 | 3 | 1 |
| 680-143024-12 | SB-2017-17-42-44 | 9/12/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 10 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-12 | SB-2017-17-42-44 | 9/12/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 490 | | mg/L | 13 | 13 | 5 |

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-143024-12 | SB-2017-17-42-44 | 9/12/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 12 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-12 | SB-2017-17-42-44 | 9/12/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 0.91 | J | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-12 | SB-2017-17-42-44 | 9/12/2017 | SM 2320B | Total/NA | | Alkalinity | 37 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-13 | SB-2017-17-52-54 | 9/12/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 10,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-13 | SB-2017-17-52-54 | 9/12/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 860 | | ug/L | 10 | 3 | 1 |
| 680-143024-13 | SB-2017-17-52-54 | 9/12/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 57 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-13 | SB-2017-17-52-54 | 9/12/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 970 | | mg/L | 13 | 13 | 5 |
| 680-143024-13 | SB-2017-17-52-54 | 9/12/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 15 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-13 | SB-2017-17-52-54 | 9/12/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-13 | SB-2017-17-52-54 | 9/12/2017 | SM 2320B | Total/NA | | Alkalinity | 54 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-14 | SB-2017-05-112-114 | 9/12/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 34,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-14 | SB-2017-05-112-114 | 9/12/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 12,000 | | ug/L | 10 | 3 | 1 |
| 680-143024-14 | SB-2017-05-112-114 | 9/12/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1,100 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-14 | SB-2017-05-112-114 | 9/12/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 16 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-14 | SB-2017-05-112-114 | 9/12/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.5 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-14 | SB-2017-05-112-114 | 9/12/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.4 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-14 | SB-2017-05-112-114 | 9/12/2017 | SM 2320B | Total/NA | | Alkalinity | 310 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-15 | SB-2017-18-12-14 | 9/12/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 630 | | ug/L | 50 | 50 | 17 |
| 680-143024-15 | SB-2017-18-12-14 | 9/12/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,800 | | ug/L | 10 | 3 | 1 |
| 680-143024-15 | SB-2017-18-12-14 | 9/12/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3 | U | ug/L | 3 | 3 | 1.5 |
| 680-143024-15 | SB-2017-18-12-14 | 9/12/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 20 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-15 | SB-2017-18-12-14 | 9/12/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 9.3 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-15 | SB-2017-18-12-14 | 9/12/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-15 | SB-2017-18-12-14 | 9/12/2017 | SM 2320B | Total/NA | | Alkalinity | 15 | U | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-16 | SB-2017-18-22-24 | 9/12/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 570 | | ug/L | 50 | 50 | 17 |
| 680-143024-16 | SB-2017-18-22-24 | 9/12/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,900 | | ug/L | 10 | 3 | 1 |
| 680-143024-16 | SB-2017-18-22-24 | 9/12/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3 | U | ug/L | 3 | 3 | 1.5 |
| 680-143024-16 | SB-2017-18-22-24 | 9/12/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 18 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-16 | SB-2017-18-22-24 | 9/12/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 9 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-16 | SB-2017-18-22-24 | 9/12/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.1 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-16 | SB-2017-18-22-24 | 9/12/2017 | SM 2320B | Total/NA | | Alkalinity | 12 | U | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-17 | SB-2017-18-32-34 | 9/12/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 1,500 | | ug/L | 50 | 50 | 17 |
| 680-143024-17 | SB-2017-18-32-34 | 9/12/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,100 | | ug/L | 10 | 3 | 1 |
| 680-143024-17 | SB-2017-18-32-34 | 9/12/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3 | U | ug/L | 3 | 3 | 1.5 |
| 680-143024-17 | SB-2017-18-32-34 | 9/12/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 4.6 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-17 | SB-2017-18-32-34 | 9/12/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 11 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-17 | SB-2017-18-32-34 | 9/12/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.4 | J | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-17 | SB-2017-18-32-34 | 9/12/2017 | SM 2320B | Total/NA | | Alkalinity | 27 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-18 | SB-2017-18-42-44 | 9/12/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 930 | | ug/L | 50 | 50 | 17 |
| 680-143024-18 | SB-2017-18-42-44 | 9/12/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 690 | | ug/L | 10 | 3 | 1 |
| 680-143024-18 | SB-2017-18-42-44 | 9/12/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3 | U | ug/L | 3 | 3 | 1.5 |

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-143024-18 | SB-2017-18-42-44 | 9/12/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 3.8 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-18 | SB-2017-18-42-44 | 9/12/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 6.7 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-18 | SB-2017-18-42-44 | 9/12/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 0.94 | J | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-18 | SB-2017-18-42-44 | 9/12/2017 | SM 2320B | Total/NA | | Alkalinity | 46 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-19 | FD-08 | 9/12/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 1,100 | | ug/L | 50 | 50 | 17 |
| 680-143024-19 | FD-08 | 9/12/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,100 | | ug/L | 10 | 3 | 1 |
| 680-143024-19 | FD-08 | 9/12/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3 | U | ug/L | 3 | 3 | 1.5 |
| 680-143024-19 | FD-08 | 9/12/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 4.4 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-19 | FD-08 | 9/12/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 11 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-19 | FD-08 | 9/12/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 0.68 | J | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-19 | FD-08 | 9/12/2017 | SM 2320B | Total/NA | | Alkalinity | 26 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-20 | SB-2017-18-52-54 | 9/13/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 5,500 | | ug/L | 50 | 50 | 17 |
| 680-143024-20 | SB-2017-18-52-54 | 9/13/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,200 | | ug/L | 10 | 3 | 1 |
| 680-143024-20 | SB-2017-18-52-54 | 9/13/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1.8 | J | ug/L | 3 | 3 | 1.5 |
| 680-143024-20 | SB-2017-18-52-54 | 9/13/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 4.1 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-20 | SB-2017-18-52-54 | 9/13/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 6.9 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-20 | SB-2017-18-52-54 | 9/13/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.5 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-20 | SB-2017-18-52-54 | 9/13/2017 | SM 2320B | Total/NA | | Alkalinity | 58 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-21 | SB-2017-17-62-64 | 9/13/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 34,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-21 | SB-2017-17-62-64 | 9/13/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,500 | | ug/L | 10 | 3 | 1 |
| 680-143024-21 | SB-2017-17-62-64 | 9/13/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 140 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-21 | SB-2017-17-62-64 | 9/13/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 69 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-21 | SB-2017-17-62-64 | 9/13/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 4.3 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-21 | SB-2017-17-62-64 | 9/13/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-21 | SB-2017-17-62-64 | 9/13/2017 | SM 2320B | Total/NA | | Alkalinity | 92 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-22 | SB-2017-17-72-74 | 9/13/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 80,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-22 | SB-2017-17-72-74 | 9/13/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 3,100 | | ug/L | 10 | 3 | 1 |
| 680-143024-22 | SB-2017-17-72-74 | 9/13/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 520 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-22 | SB-2017-17-72-74 | 9/13/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 27 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-22 | SB-2017-17-72-74 | 9/13/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.8 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-22 | SB-2017-17-72-74 | 9/13/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.9 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-22 | SB-2017-17-72-74 | 9/13/2017 | SM 2320B | Total/NA | | Alkalinity | 190 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-23 | SB-2017-18-62-64 | 9/13/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 45,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-23 | SB-2017-18-62-64 | 9/13/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,400 | | ug/L | 10 | 3 | 1 |
| 680-143024-23 | SB-2017-18-62-64 | 9/13/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 200 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-23 | SB-2017-18-62-64 | 9/13/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 21 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-23 | SB-2017-18-62-64 | 9/13/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.8 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-23 | SB-2017-18-62-64 | 9/13/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.6 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-23 | SB-2017-18-62-64 | 9/13/2017 | SM 2320B | Total/NA | | Alkalinity | 140 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-24 | SB-2017-17-78-80 | 9/13/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 36,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-24 | SB-2017-17-78-80 | 9/13/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 5,100 | | ug/L | 10 | 3 | 1 |

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-143024-24 | SB-2017-17-78-80 | 9/13/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 93 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-24 | SB-2017-17-78-80 | 9/13/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 35 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-24 | SB-2017-17-78-80 | 9/13/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 4.7 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-24 | SB-2017-17-78-80 | 9/13/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.1 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-24 | SB-2017-17-78-80 | 9/13/2017 | SM 2320B | Total/NA | | Alkalinity | 310 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-25 | SB-2017-18-72-74 | 9/13/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 44,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-25 | SB-2017-18-72-74 | 9/13/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,600 | | ug/L | 10 | 3 | 1 |
| 680-143024-25 | SB-2017-18-72-74 | 9/13/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 250 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-25 | SB-2017-18-72-74 | 9/13/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 17 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143024-25 | SB-2017-18-72-74 | 9/13/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 4.3 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-25 | SB-2017-18-72-74 | 9/13/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.2 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-25 | SB-2017-18-72-74 | 9/13/2017 | SM 2320B | Total/NA | | Alkalinity | 200 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143024-26 | SB-2017-16-22-24 | 9/13/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 17,000 | | ug/L | 50 | 50 | 17 |
| 680-143024-26 | SB-2017-16-22-24 | 9/13/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 470 | | ug/L | 10 | 3 | 1 |
| 680-143024-26 | SB-2017-16-22-24 | 9/13/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 440 | | ug/L | 3 | 3 | 1.5 |
| 680-143024-26 | SB-2017-16-22-24 | 9/13/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 240 | | mg/L | 5 | 5 | 2 |
| 680-143024-26 | SB-2017-16-22-24 | 9/13/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 10 | | mg/L | 1 | 1 | 0.4 |
| 680-143024-26 | SB-2017-16-22-24 | 9/13/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.7 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143024-26 | SB-2017-16-22-24 | 9/13/2017 | SM 2320B | Total/NA | | Alkalinity | 75 | | mg/L | 5 | 3.2 | 1.1 |

Notes:

Qualified Result

mg/l = milligram per liter

µg/L = microgram per liter

LOQ = Limit of Quantitation

LOD = Limit of Detection

DL = Method Detection Limit

**Dissolved Metals**
SW 846/6010C/6020A
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-142177-1 |
| Laboratory: Test America, Savannah, GA | Date: 09/01/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-142177-1 | SB-2017-07-25-27 | 8/15/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142177-2 | SB-2017-07-35-37 | 8/15/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142177-3 | SB-2017-07-45-47 | 8/15/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142177-4 | SB-2017-07-55-57 | 8/16/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142177-5 | SB-2017-07-65-67 | 8/16/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142177-6 | SB-2017-07-75-77 | 8/16/2017 | Dissolved As, Fe, Mn | Groundwater |

Summary - Data validation was performed on the data for six (6) groundwater profile samples collected from upgradient locations on 8/15 and 8/16/2017 during drilling activities at Shepley's Hill. All samples were submitted for dissolved metals analyses by Method SW846/6010C for iron and manganese and Method SW846/6020A for arsenic. Samples were filtered in the field and preserved for sample shipment.

Sample Delivery and Condition – All samples arrived at the laboratory on 8/17/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the 6-month holding time required for preserved aqueous samples.

*Qualification:* None required

Laboratory Control Sample – The LCS recoveries for the reported target analytes met all %R control limits.

*Qualification:* None required.

MS/MSD – Matrix spike samples were not submitted with this sample set.

*Qualification:* None required.

Method Blank – The method blanks associated and analyzed with these samples were non-

detect for all target analytes.

*Qualification:* None required.

Field Duplicate – Field duplicate samples were not submitted with this sample set.

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "PQL U." Analyte detections below the PQL were reported as J qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table -** The dissolved metals results reported in this SDG are acceptable as reported. No qualifications were required and the data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value | Lab Qualifier | Validated Value | Validation Qualifier |
|---|---|---|---|---|---|---|
| 680-142177-1 | SB-2017-07-25-27 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142177-2 | SB-2017-07-35-37 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142177-3 | SB-2017-07-45-47 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142177-4 | SB-2017-07-55-57 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142177-5 | SB-2017-07-65-67 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142177-6 | SB-2017-07-75-77 | Dissolved As, Fe, Mn | No qualifications needed. | | | |

**Miscellaneous Chemistry Parameters**
Alkalinity (SM2320B), Sulfate/Chloride (SW9056A) and Dissolved Organic Carbon (DOC) (SW9060)
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-142177-1 |
| Laboratory: Test America, Savannah, GA | Date: 09/01/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-142177-1 | SB-2017-07-25-27 | 8/15/2017 | Miscellaneous Parameters | Groundwater |
| 680-142177-2 | SB-2017-07-35-37 | 8/15/2017 | Miscellaneous Parameters | Groundwater |
| 680-142177-3 | SB-2017-07-45-47 | 8/15/2017 | Miscellaneous Parameters | Groundwater |
| 680-142177-4 | SB-2017-07-55-57 | 8/16/2017 | Miscellaneous Parameters | Groundwater |
| 680-142177-5 | SB-2017-07-65-67 | 8/16/2017 | Miscellaneous Parameters | Groundwater |
| 680-142177-6 | SB-2017-07-75-77 | 8/16/2017 | Miscellaneous Parameters | Groundwater |

Summary - Data validation was performed on the data for six (6) groundwater profile samples collected from upgradient locations on 8/15 and 8/16/2017 during drilling activities at Shepley's Hill and submitted for the miscellaneous wet chemistry analyses listed above. Samples submitted for dissolved organic carbon (DOC) analyses were field filtered. The samples submitted for alkalinity and DOC analyses were shipped to Test America Denver for analysis.

Sample Delivery and Condition – All samples arrived at the laboratory on 8/17/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required.

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the respective holding times required for preserved aqueous samples.

*Qualification:* None required.

Method Blank –The method blanks for DOC, chloride and sulfate were free from contamination. Low level contamination was detected in the method blanks prepared and analyzed for alkalinity (2.85 and 2.9 mg/L). All reported alkalinity sample results were greater than ten times the blank levels.

*Qualification:* None required.

Laboratory Control Sample – The LCS %R results for all methods associated with these samples

met the control limits.

*Qualification:* None required.

MS/MSD – Matrix spike samples were not submitted with this sample set.

*Qualification:* None required.

Field Blanks – Field blank samples were not submitted with this sample set.

*Qualification:* None required.

Field Duplicate – Field duplicate samples were not submitted with this sample set.

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "LOQ U." Analyte detections below the LOQ were reported as J-qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table** - The miscellaneous parameter results reported in this SDG are acceptable as reported. The data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value | Lab Qualifier | Validated Value | Validation Qualifier |
|---|---|---|---|---|---|---|
| 680-142177-1 | SB-2017-07-25-27 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142177-2 | SB-2017-07-35-37 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142177-3 | SB-2017-07-45-47 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142177-4 | SB-2017-07-55-57 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142177-5 | SB-2017-07-65-67 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142177-6 | SB-2017-07-75-77 | Miscellaneous Parameters | No qualifications needed. | | | |

**SHL 2017 Drilling Validated Data - 142177**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Unit | Flag | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142177-1 | SB-2017-07-25-27 | 8/15/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 7,300 | ug/L | | 50 | 50 | 17 |
| 680-142177-1 | SB-2017-07-25-27 | 8/15/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,900 | ug/L | | 10 | 3 | 1 |
| 680-142177-1 | SB-2017-07-25-27 | 8/15/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 15 | ug/L | | 3 | 3 | 1.5 |
| 680-142177-1 | SB-2017-07-25-27 | 8/15/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 1.2 | mg/L | | 0.5 | 0.5 | 0.2 |
| 680-142177-1 | SB-2017-07-25-27 | 8/15/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.4 | mg/L | | 1 | 1 | 0.4 |
| 680-142177-1 | SB-2017-07-25-27 | 8/15/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.4 | mg/L | | 1 | 0.5 | 0.16 |
| 680-142177-1 | SB-2017-07-25-27 | 8/15/2017 | SM 2320B | Total/NA | | Alkalinity | 33 | mg/L | | 5 | 3.2 | 1.1 |
| 680-142177-2 | SB-2017-07-35-37 | 8/15/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 500 | ug/L | | 50 | 50 | 17 |
| 680-142177-2 | SB-2017-07-35-37 | 8/15/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,700 | ug/L | | 10 | 3 | 1 |
| 680-142177-2 | SB-2017-07-35-37 | 8/15/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3.0 | ug/L | U | 3 | 3 | 1.5 |
| 680-142177-2 | SB-2017-07-35-37 | 8/15/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 1.0 | mg/L | | 0.5 | 0.5 | 0.2 |
| 680-142177-2 | SB-2017-07-35-37 | 8/15/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 4.6 | mg/L | | 1 | 1 | 0.4 |
| 680-142177-2 | SB-2017-07-35-37 | 8/15/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.5 | mg/L | | 1 | 0.5 | 0.16 |
| 680-142177-2 | SB-2017-07-35-37 | 8/15/2017 | SM 2320B | Total/NA | | Alkalinity | 62 | mg/L | | 5 | 3.2 | 1.1 |
| 680-142177-3 | SB-2017-07-45-47 | 8/15/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 6,800 | ug/L | | 50 | 50 | 17 |
| 680-142177-3 | SB-2017-07-45-47 | 8/15/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,500 | ug/L | | 10 | 3 | 1 |
| 680-142177-3 | SB-2017-07-45-47 | 8/15/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 33 | ug/L | | 3 | 3 | 1.5 |
| 680-142177-3 | SB-2017-07-45-47 | 8/15/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 1.1 | mg/L | | 0.5 | 0.5 | 0.2 |
| 680-142177-3 | SB-2017-07-45-47 | 8/15/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 1.8 | mg/L | | 1 | 1 | 0.4 |
| 680-142177-3 | SB-2017-07-45-47 | 8/15/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.1 | mg/L | | 1 | 0.5 | 0.16 |
| 680-142177-3 | SB-2017-07-45-47 | 8/15/2017 | SM 2320B | Total/NA | | Alkalinity | 79 | mg/L | | 5 | 3.2 | 1.1 |
| 680-142177-4 | SB-2017-07-55-57 | 8/16/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 51,000 | ug/L | | 50 | 50 | 17 |
| 680-142177-4 | SB-2017-07-55-57 | 8/16/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,700 | ug/L | | 10 | 3 | 1 |
| 680-142177-4 | SB-2017-07-55-57 | 8/16/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 270 | ug/L | | 3 | 3 | 1.5 |
| 680-142177-4 | SB-2017-07-55-57 | 8/16/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 1.6 | mg/L | | 0.5 | 0.5 | 0.2 |
| 680-142177-4 | SB-2017-07-55-57 | 8/16/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.9 | mg/L | | 1 | 1 | 0.4 |
| 680-142177-4 | SB-2017-07-55-57 | 8/16/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.6 | mg/L | | 1 | 0.5 | 0.16 |
| 680-142177-4 | SB-2017-07-55-57 | 8/16/2017 | SM 2320B | Total/NA | | Alkalinity | 77 | mg/L | | 5 | 3.2 | 1.1 |
| 680-142177-5 | SB-2017-07-65-67 | 8/16/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 30,000 | ug/L | | 50 | 50 | 17 |
| 680-142177-5 | SB-2017-07-65-67 | 8/16/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,800 | ug/L | | 10 | 3 | 1 |
| 680-142177-5 | SB-2017-07-65-67 | 8/16/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3,000 | ug/L | | 3 | 3 | 1.5 |
| 680-142177-5 | SB-2017-07-65-67 | 8/16/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 1.4 | mg/L | | 0.5 | 0.5 | 0.2 |
| 680-142177-5 | SB-2017-07-65-67 | 8/16/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 5.1 | mg/L | | 1 | 1 | 0.4 |
| 680-142177-5 | SB-2017-07-65-67 | 8/16/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 0.75 | mg/L | J | 1 | 0.5 | 0.16 |
| 680-142177-5 | SB-2017-07-65-67 | 8/16/2017 | SM 2320B | Total/NA | | Alkalinity | 45 | mg/L | | 5 | 3.2 | 1.1 |
| 680-142177-6 | SB-2017-07-75-77 | 8/16/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 4,300 | ug/L | | 50 | 50 | 17 |
| 680-142177-6 | SB-2017-07-75-77 | 8/16/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,700 | ug/L | | 10 | 3 | 1 |
| 680-142177-6 | SB-2017-07-75-77 | 8/16/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 400 | ug/L | | 3 | 3 | 1.5 |

**SHL 2017 Drilling Validated Data - 142177**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Unit | Flag | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142177-6 | SB-2017-07-75-77 | 8/16/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 2.4 | mg/L | | 0.5 | 0.5 | 0.2 |
| 680-142177-6 | SB-2017-07-75-77 | 8/16/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 6.8 | mg/L | | 1 | 1 | 0.4 |
| 680-142177-6 | SB-2017-07-75-77 | 8/16/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 0.64 | mg/L | J | 1 | 0.5 | 0.16 |
| 680-142177-6 | SB-2017-07-75-77 | 8/16/2017 | SM 2320B | Total/NA | | Alkalinity | 85 | mg/L | | 5 | 3.2 | 1.1 |

Notes:

mg/l = milligram per liter

µg/L = microgram per liter

LOQ = Limit of Quantitation

LOD = Limit of Detection

DL = Method Detection Limit

**Dissolved Metals**
SW 846/6010C/6020A
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-142317-1 |
| Laboratory: Test America, Savannah, GA | Date: 09/05/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-142317-1 | SB-2017-06-35-37 | 8/17/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142317-2 | SB-2017-06-45-47 | 8/17/2017 | Dissolved As, Fe, Mn | Groundwater |

Summary - Data validation was performed on the data for two (2) groundwater profile samples collected from upgradient locations on 8/17/2017 during drilling activities at Shepley's Hill. All samples were submitted for dissolved metals analyses by Method SW846/6010C for iron and manganese and Method SW846/6020A for arsenic. Samples were filtered in the field and preserved for sample shipment.

Sample Delivery and Condition – All samples arrived at the laboratory on 8/19/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the 6-month holding time required for preserved aqueous samples.

*Qualification:* None required

Laboratory Control Sample – The LCS recoveries for the reported target analytes met all %R control limits.

*Qualification:* None required.

MS/MSD – Matrix spike samples were not submitted with this sample set.

*Qualification:* None required.

Method Blank – The method blanks associated and analyzed with these samples were non-detect for all target analytes.

*Qualification:* None required.

Field Duplicate – Field duplicate samples were not submitted with this sample set.

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "PQL U." Analyte detections below the PQL were reported as J qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table -** The dissolved metals results reported in this SDG are acceptable as reported. No qualifications were required and the data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value | Lab Qualifier | Validated Value | Validation Qualifier |
|---|---|---|---|---|---|---|
| 680-142317-1 | SB-2017-06-35-37 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-142317-2 | SB-2017-06-45-47 | Dissolved As, Fe, Mn | No qualifications needed. | | | |

**Miscellaneous Chemistry Parameters**
Alkalinity (SM2320B), Sulfate/Chloride (SW9056A) and Dissolved Organic Carbon (DOC) (SW9060)
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-142317-1 |
| Laboratory: Test America, Savannah, GA | Date: 09/05/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-142317-1 | SB-2017-06-35-37 | 8/17/2017 | Miscellaneous Parameters | Groundwater |
| 680-142317-2 | SB-2017-06-45-47 | 8/17/2017 | Miscellaneous Parameters | Groundwater |

Summary - Data validation was performed on the data for two (2) groundwater profile samples collected from upgradient locations on 8/17/2017 during drilling activities at Shepley's Hill and submitted for the miscellaneous wet chemistry analyses listed above. Samples submitted for dissolved organic carbon (DOC) analyses were field filtered. The samples submitted for alkalinity and DOC analyses were shipped to Test America Denver for analysis.

Sample Delivery and Condition – All samples arrived at the laboratory on 8/19/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required.

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the respective holding times required for preserved aqueous samples.

*Qualification:* None required.

Method Blank –The method blanks for DOC, chloride and sulfate were free from contamination. Low level contamination was detected in the method blank prepared and analyzed for alkalinity (3.05 mg/L). All reported alkalinity sample results were greater than five times the blank level.

*Qualification:* None required.

Laboratory Control Sample – The LCS %R results for all methods associated with these samples met the control limits.

*Qualification:* None required.

MS/MSD – Matrix spike samples were not submitted with this sample set.

*Qualification:* None required.

Field Blanks – Field blank samples were not submitted with this sample set.

*Qualification:* None required.

Field Duplicate – Field duplicate samples were not submitted with this sample set.

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "LOQ U." Analyte detections below the LOQ were reported as J-qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table** - The miscellaneous parameter results reported in this SDG are acceptable as reported. The data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value | Lab Qualifier | Validated Value | Validation Qualifier |
|---|---|---|---|---|---|---|
| 680-142317-1 | SB-2017-06-35-37 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-142317-2 | SB-2017-07-45-47 | Miscellaneous Parameters | No qualifications needed. | | | |

**SHL 2017 Drilling Validated Data - 142317**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Unit | Flag | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142317-1 | SB-2017-06-35-37 | 8/17/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 620 | ug/L | | 50 | 50 | 17 |
| 680-142317-1 | SB-2017-06-35-37 | 8/17/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 490 | ug/L | | 10 | 3 | 1 |
| 680-142317-1 | SB-2017-06-35-37 | 8/17/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3 | ug/L | U | 3 | 3 | 1.5 |
| 680-142317-1 | SB-2017-06-35-37 | 8/17/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 2.3 | mg/L | | 0.5 | 0.5 | 0.2 |
| 680-142317-1 | SB-2017-06-35-37 | 8/17/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.2 | mg/L | | 1 | 1 | 0.4 |
| 680-142317-1 | SB-2017-06-35-37 | 8/17/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 0.78 | mg/L | J | 1 | 0.5 | 0.16 |
| 680-142317-1 | SB-2017-06-35-37 | 8/17/2017 | SM 2320B | Total/NA | | Alkalinity | 25 | mg/L | | 5 | 3.2 | 1.1 |
| 680-142317-2 | SB-2017-06-45-47 | 8/17/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 50 | ug/L | U | 50 | 50 | 17 |
| 680-142317-2 | SB-2017-06-45-47 | 8/17/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1500 | ug/L | J | 10 | 3 | 1 |
| 680-142317-2 | SB-2017-06-45-47 | 8/17/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3 | ug/L | U | 3 | 3 | 1.5 |
| 680-142317-2 | SB-2017-06-45-47 | 8/17/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 1.4 | mg/L | | 0.5 | 0.5 | 0.2 |
| 680-142317-2 | SB-2017-06-45-47 | 8/17/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3 | mg/L | | 1 | 1 | 0.4 |
| 680-142317-2 | SB-2017-06-45-47 | 8/17/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.3 | mg/L | | 1 | 0.5 | 0.16 |
| 680-142317-2 | SB-2017-06-45-47 | 8/17/2017 | SM 2320B | Total/NA | | Alkalinity | 52 | mg/L | | 5 | 3.2 | 1.1 |

Notes:

mg/l = milligram per liter

µg/L = microgram per liter

LOQ = Limit of Quantitation

LOD = Limit of Detection

DL = Method Detection Limit

**Dissolved Metals**
SW 846/6010C/6020A
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-142501-1 |
| Laboratory: Test America, Savannah, GA | Date: 09/11/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-142501-1 | SB-2017-06-62-64 | 8/21/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142501-2 | SB-2017-08-27-29 | 8/21/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142501-3 | SB-2017-08-37-39 | 8/21/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142501-4 | SB-2017-08-47-49 | 8/21/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142501-5 | SB-2017-DUP-1 | 8/21/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142501-6 | SB-2017-08-57-59 | 8/22/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142501-7 | SB-2017-08-67-69 | 8/22/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142501-8 | SB-2017-08-77-79 | 8/22/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142501-9 | SB-2017-08-87-89 | 8/22/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142501-10 | SB-2017-08-94.6-96.6 | 8/23/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142501-11 | SB-2017-09-22-24 | 8/23/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142501-12 | SB-2017-09-32-34 | 8/23/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142501-13 | SB-2017-DUP-2 | 8/23/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142501-14 | SB-2017-09-42-44 | 8/23/2017 | Dissolved As, Fe, Mn | Groundwater |

Summary - Data validation was performed on the data for twelve (12) groundwater profile samples and two (2) field duplicate samples collected from upgradient locations on 8/21, 8/22 and 8/23/2017 during drilling activities at Shepley's Hill. All samples were submitted for dissolved metals analyses by Method SW846/6010C for iron and manganese and Method SW846/6020A for arsenic. Samples were filtered in the field and preserved for sample shipment.

Sample Delivery and Condition – All samples arrived at the laboratory on 8/25/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the 6-month holding time required for preserved aqueous samples.

*Qualification:* None required

Laboratory Control Sample – The LCS recoveries for the reported target analytes met all %R control limits.

*Qualification:* None required.

MS/MSD – Two sets of MS/MSD samples were submitted with this sample set; samples SB-2017-08-47-49 and SB-2017-09-43-44 (Lab Sample IDs: 680-142501-4 and -14). The native sample results for arsenic, iron and manganese from sample SB-2017-08-47-49 and iron and manganese from sample SB-2017-09-42-44 were greater than four (4) times the spike levels and the MS/MSD %Rs could not be calculated. The MSD %R and RPD for arsenic from sample SB-2017-09-42-44 (Lab Sample ID: 680-142501-14) were outside control limits.

*Qualification:* The result for arsenic in sample SB-2017-09-42-44 (Lab Sample ID: 680-142501-14) was qualified as estimated (J).

Method Blank – The method blanks associated and analyzed with these samples were non-detect for all target analytes.

*Qualification:* None required.

Field Duplicate – Two field duplicate samples were submitted with this sample set. Sample SB-2017-DUP-1 was the field duplicate sample of SB-2017-08-47-49 (Lab Sample IDs: 680-142501-5 and -4). Sample SB-2017-DUP-2 was the field duplicate sample of SB-2017-09-32-34 (Lab Sample IDs: 680-142501-13 and -12). FD results were comparable with RPDs less than 20%. D sample results are summarized in the table below.

| Lab Sample ID | 680-142501-4 | 680-142501-5 | |
|---|---|---|---|
| Client Sample ID | SB-2017-08-47-49 | SB-2017-DUP-1 | |
| Collection Date | 8/21/2017 | 8/21/2017 | |
| | **Result (µg/L)** | **Result (µg/L)** | **RPD (%)** |
| Iron | 73,000 | 76,000 | 4.0 |
| Manganese | 2,400 | 2,500 | 4.1 |
| Arsenic | 890 | 1,000 | 11.6 |
| Lab Sample ID | 680-142501-12 | 680-142501-13 | |
| Client Sample ID | SB-2017-09-32-34 | SB-2017-DUP-2 | |
| Collection Date | 8/23/2017 | 8/23/2017 | |
| Analyte | **Result (µg/L)** | **Result (µg/L)** | **RPD (%)** |
| Iron | 29,000 | 30,000 | 3.4 |
| Manganese | 1,600 | 1,600 | 0 |
| Arsenic | 82 | 74 | 9.6 |

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "PQL U." Analyte detections below the PQL were reported as J qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table -** The dissolved metals results reported in this SDG are acceptable as reported. No qualifications were required and the data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value (µg/L) | Lab Qualifier | Validated Value | Validation Qualifier (µg/L) |
|---|---|---|---|---|---|---|
| 680-142501-1 | SB-2017-06-62-64 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142501-2 | SB-2017-08-27-29 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142501-3 | SB-2017-08-37-39 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142501-4 | SB-2017-08-47-49 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142501-5 | SB-2017-DUP-1 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142501-6 | SB-2017-08-57-59 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142501-7 | SB-2017-08-67-69 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142501-8 | SB-2017-08-77-79 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142501-9 | SB-2017-08-87-89 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142501-10 | SB-2017-08-94.6-96.6 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142501-11 | SB-2017-09-22-24 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142501-12 | SB-2017-09-32-34 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142501-13 | SB-2017-DUP-2 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142501-14 | SB-2017-09-42-44 | Dissolved As | 120 | J | 120 | J |

**Miscellaneous Chemistry Parameters**
Alkalinity (SM2320B), Sulfate/Chloride (SW9056A) and Dissolved Organic Carbon (DOC) (SW9060)
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-142501-1 |
| Laboratory: Test America, Savannah, GA | Date: 09/11/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-142501-1 | SB-2017-06-62-64 | 8/21/2017 | Miscellaneous Parameters | Groundwater |
| 680-142501-2 | SB-2017-08-27-29 | 8/21/2017 | Miscellaneous Parameters | Groundwater |
| 680-142501-3 | SB-2017-08-37-39 | 8/21/2017 | Miscellaneous Parameters | Groundwater |
| 680-142501-4 | SB-2017-08-47-49 | 8/21/2017 | Miscellaneous Parameters | Groundwater |
| 680-142501-5 | SB-2017-DUP-1 | 8/21/2017 | Miscellaneous Parameters | Groundwater |
| 680-142501-6 | SB-2017-08-57-59 | 8/22/2017 | Miscellaneous Parameters | Groundwater |
| 680-142501-7 | SB-2017-08-67-69 | 8/22/2017 | Miscellaneous Parameters | Groundwater |
| 680-142501-8 | SB-2017-08-77-79 | 8/22/2017 | Miscellaneous Parameters | Groundwater |
| 680-142501-9 | SB-2017-08-87-89 | 8/22/2017 | Miscellaneous Parameters | Groundwater |
| 680-142501-10 | SB-2017-08-94.6-96.6 | 8/23/2017 | Miscellaneous Parameters | Groundwater |
| 680-142501-11 | SB-2017-09-22-24 | 8/23/2017 | Miscellaneous Parameters | Groundwater |
| 680-142501-12 | SB-2017-09-32-34 | 8/23/2017 | Miscellaneous Parameters | Groundwater |
| 680-142501-13 | SB-2017-DUP-2 | 8/23/2017 | Miscellaneous Parameters | Groundwater |
| 680-142501-14 | SB-2017-09-42-44 | 8/23/2017 | Miscellaneous Parameters | Groundwater |

Summary - Data validation was performed on the data for twelve (12) groundwater profile samples and two (2) field duplicate samples were collected from upgradient locations on 8/21, 8/22 and 8/23/2017 during drilling activities at Shepley's Hill and submitted for the miscellaneous wet chemistry analyses listed above. Samples submitted for dissolved organic carbon (DOC) analyses were field filtered. The samples submitted for alkalinity and DOC analyses were shipped to Test America Denver for analysis.

Sample Delivery and Condition – All samples arrived at the laboratory on 8/25/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required.

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the respective holding times required for

preserved aqueous samples.

*Qualification:* None required.

Method Blank –The method blanks for DOC, chloride and sulfate were free from contamination. Low level contamination was detected in the method blanks prepared and analyzed for alkalinity (3.16 and 3.17 mg/L). All reported alkalinity sample results were greater than ten times the blank levels.

*Qualification:* None required.

Laboratory Control Sample – The LCS %R results for all methods associated with these samples met the control limits.

*Qualification:* None required.

MS/MSD – Two sets of MS/MSD samples were submitted with this sample set; samples SB-2017-08-47-49 and SB-2017-09-43-44 (Lab Sample IDs: 680-142501-4 and -14). The MS/MSD %Rs and RPDs were within control limits for all spiked analytes.

*Qualification:* None required.

Field Blanks – Field blank samples were not submitted with this sample set.

*Qualification:* None required.

Field Duplicate – Two field duplicate samples were submitted with this sample set. Sample SB-2017-DUP-1 was the field duplicate sample of SB-2017-08-47-49 (Lab Sample ID: 680-142501-5 and -4). Sample SB-2017-DUP-2 was the field duplicate sample of SB-2017-09-32-34 (Lab Sample ID: 680-142501-13 and -12). Detected results were comparable for all analytes with RPDs less than 10%. FD sample results are summarized in the table below.

| Lab Sample ID | 680-142501-12 | 680-142501-13 | |
|---|---|---|---|
| Client Sample ID | SB-2017-09-32-34 | SB-2017-DUP-2 | |
| Collection Date | 8/23/2017 | 8/23/2017 | |
| | **Result (mg/L)** | **Result (mg/L)** | **RPD (%)** |
| Chloride | 6.9 | 7.0 | 1.4 |
| Sulfate | 8.8 | 8.9 | 1.1 |
| DOC | 6.9 | 6.8 | 1.5 |
| Alkalinity | 140 | 140 | 0 |
| Lab Sample ID | 680-142501-4 | 680-142501-5 | |
| Client Sample ID | SB-2017-08-47-49 | SB-2017-DUP-1 | |
| Collection Date | 8/21/2017 | 8/21/2017 | |
| | **Result (mg/L)** | **Result (mg/L)** | **RPD (%)** |
| Chloride | 5.7 | 5.7 | 0 |
| Sulfate | 0.5 | 0.5 | 0 |
| DOC | 5.1 | 5.4 | 5.7 |
| Alkalinity | 240 | 240 | 0 |

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as “ND”; these results should be considered the equivalent of “LOQ U.” Analyte detections below the LOQ were reported as J-qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table** - The miscellaneous parameter results reported in this SDG are acceptable as reported. The data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value (mg/L) | Lab Qualifier | Validated Value | Validation Qualifier (mg/L) |
|---|---|---|---|---|---|---|
| 680-142501-1 | SB-2017-06-62-64 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142501-2 | SB-2017-08-27-29 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142501-3 | SB-2017-08-37-39 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142501-4 | SB-2017-08-47-49 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142501-5 | SB-2017-DUP-1 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142501-6 | SB-2017-08-57-59 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142501-7 | SB-2017-08-67-69 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142501-8 | SB-2017-08-77-79 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142501-9 | SB-2017-08-87-89 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142501-10 | SB-2017-08-94.6-96.6 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142501-11 | SB-2017-09-22-24 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142501-12 | SB-2017-09-32-34 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142501-13 | SB-2017-DUP-2 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142501-14 | SB-2017-09-42-44 | Miscellaneous Parameters | No qualification needed. | | | |

**SHL 2017 Drilling Validated Data - 142501**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142501-1 | SB-2017-06-62-64 | 8/21/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 41 | J | ug/L | 50 | 50 | 17 |
| 680-142501-1 | SB-2017-06-62-64 | 8/21/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 340 | | ug/L | 10 | 3 | 1 |
| 680-142501-1 | SB-2017-06-62-64 | 8/21/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 18 | | ug/L | 3 | 3 | 1.5 |
| 680-142501-1 | SB-2017-06-62-64 | 8/21/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 1.9 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142501-1 | SB-2017-06-62-64 | 8/21/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 4.3 | | mg/L | 1 | 1 | 0.4 |
| 680-142501-1 | SB-2017-06-62-64 | 8/21/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 0.82 | J | mg/L | 1 | 0.5 | 0.16 |
| 680-142501-1 | SB-2017-06-62-64 | 8/21/2017 | SM 2320B | Total/NA | | Alkalinity | 21 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142501-10 | SB-2017-08-94.6-96.6 | 8/23/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 33,000 | | ug/L | 50 | 50 | 17 |
| 680-142501-10 | SB-2017-08-94.6-96.6 | 8/23/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 6,000 | | ug/L | 10 | 3 | 1 |
| 680-142501-10 | SB-2017-08-94.6-96.6 | 8/23/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 7,600 | | ug/L | 3 | 3 | 1.5 |
| 680-142501-10 | SB-2017-08-94.6-96.6 | 8/23/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 11 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142501-10 | SB-2017-08-94.6-96.6 | 8/23/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 6.7 | | mg/L | 1 | 1 | 0.4 |
| 680-142501-10 | SB-2017-08-94.6-96.6 | 8/23/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.8 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142501-10 | SB-2017-08-94.6-96.6 | 8/23/2017 | SM 2320B | Total/NA | | Alkalinity | 240 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142501-11 | SB-2017-09-22-24 | 8/23/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 21,000 | | ug/L | 50 | 50 | 17 |
| 680-142501-11 | SB-2017-09-22-24 | 8/23/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 850 | | ug/L | 10 | 3 | 1 |
| 680-142501-11 | SB-2017-09-22-24 | 8/23/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 24 | | ug/L | 3 | 3 | 1.5 |
| 680-142501-11 | SB-2017-09-22-24 | 8/23/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 17 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142501-11 | SB-2017-09-22-24 | 8/23/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 1 | U | mg/L | 1 | 1 | 0.4 |
| 680-142501-11 | SB-2017-09-22-24 | 8/23/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 19 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142501-11 | SB-2017-09-22-24 | 8/23/2017 | SM 2320B | Total/NA | | Alkalinity | 430 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142501-12 | SB-2017-09-32-34 | 8/23/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 29,000 | | ug/L | 50 | 50 | 17 |
| 680-142501-12 | SB-2017-09-32-34 | 8/23/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,600 | | ug/L | 10 | 3 | 1 |
| 680-142501-12 | SB-2017-09-32-34 | 8/23/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 82 | | ug/L | 3 | 3 | 1.5 |
| 680-142501-12 | SB-2017-09-32-34 | 8/23/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 6.9 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142501-12 | SB-2017-09-32-34 | 8/23/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 8.8 | | mg/L | 1 | 1 | 0.4 |
| 680-142501-12 | SB-2017-09-32-34 | 8/23/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 6.9 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142501-12 | SB-2017-09-32-34 | 8/23/2017 | SM 2320B | Total/NA | | Alkalinity | 140 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142501-13 | SB-2017-DUP-2 | 8/23/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 30,000 | | ug/L | 50 | 50 | 17 |
| 680-142501-13 | SB-2017-DUP-2 | 8/23/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,600 | | ug/L | 10 | 3 | 1 |
| 680-142501-13 | SB-2017-DUP-2 | 8/23/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 74 | | ug/L | 3 | 3 | 1.5 |
| 680-142501-13 | SB-2017-DUP-2 | 8/23/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 7 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142501-13 | SB-2017-DUP-2 | 8/23/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 8.9 | | mg/L | 1 | 1 | 0.4 |
| 680-142501-13 | SB-2017-DUP-2 | 8/23/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 6.8 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142501-13 | SB-2017-DUP-2 | 8/23/2017 | SM 2320B | Total/NA | | Alkalinity | 140 | | mg/L | 5 | 3.2 | 1.1 |

**SHL 2017 Drilling Validated Data - 142501**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142501-14 | SB-2017-09-42-44 | 8/23/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 60,000 | | ug/L | 50 | 50 | 17 |
| 680-142501-14 | SB-2017-09-42-44 | 8/23/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 5,600 | | ug/L | 10 | 3 | 1 |
| 680-142501-14 | SB-2017-09-42-44 | 8/23/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 120 | J | ug/L | 3 | 3 | 1.5 |
| 680-142501-14 | SB-2017-09-42-44 | 8/23/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 31 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142501-14 | SB-2017-09-42-44 | 8/23/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 0.44 | J | mg/L | 1 | 1 | 0.4 |
| 680-142501-14 | SB-2017-09-42-44 | 8/23/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 6.8 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142501-14 | SB-2017-09-42-44 | 8/23/2017 | SM 2320B | Total/NA | | Alkalinity | 360 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142501-2 | SB-2017-08-27-29 | 8/21/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 20,000 | | ug/L | 50 | 50 | 17 |
| 680-142501-2 | SB-2017-08-27-29 | 8/21/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 920 | | ug/L | 10 | 3 | 1 |
| 680-142501-2 | SB-2017-08-27-29 | 8/21/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 14 | | ug/L | 3 | 3 | 1.5 |
| 680-142501-2 | SB-2017-08-27-29 | 8/21/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 16 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142501-2 | SB-2017-08-27-29 | 8/21/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 1 | U | mg/L | 1 | 1 | 0.4 |
| 680-142501-2 | SB-2017-08-27-29 | 8/21/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 21 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142501-2 | SB-2017-08-27-29 | 8/21/2017 | SM 2320B | Total/NA | | Alkalinity | 570 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142501-3 | SB-2017-08-37-39 | 8/21/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 90,000 | | ug/L | 50 | 50 | 17 |
| 680-142501-3 | SB-2017-08-37-39 | 8/21/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,700 | | ug/L | 10 | 3 | 1 |
| 680-142501-3 | SB-2017-08-37-39 | 8/21/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 220 | | ug/L | 3 | 3 | 1.5 |
| 680-142501-3 | SB-2017-08-37-39 | 8/21/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 6.2 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142501-3 | SB-2017-08-37-39 | 8/21/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 1 | U | mg/L | 1 | 1 | 0.4 |
| 680-142501-3 | SB-2017-08-37-39 | 8/21/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 6.3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142501-3 | SB-2017-08-37-39 | 8/21/2017 | SM 2320B | Total/NA | | Alkalinity | 270 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142501-4 | SB-2017-08-47-49 | 8/21/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 73,000 | | ug/L | 50 | 50 | 17 |
| 680-142501-4 | SB-2017-08-47-49 | 8/21/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,400 | | ug/L | 10 | 3 | 1 |
| 680-142501-4 | SB-2017-08-47-49 | 8/21/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 890 | | ug/L | 3 | 3 | 1.5 |
| 680-142501-4 | SB-2017-08-47-49 | 8/21/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 5.7 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142501-4 | SB-2017-08-47-49 | 8/21/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 0.5 | J | mg/L | 1 | 1 | 0.4 |
| 680-142501-4 | SB-2017-08-47-49 | 8/21/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 5.1 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142501-4 | SB-2017-08-47-49 | 8/21/2017 | SM 2320B | Total/NA | | Alkalinity | 240 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142501-5 | SB-2017-DUP-1 | 8/21/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 76,000 | | ug/L | 50 | 50 | 17 |
| 680-142501-5 | SB-2017-DUP-1 | 8/21/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,500 | | ug/L | 10 | 3 | 1 |
| 680-142501-5 | SB-2017-DUP-1 | 8/21/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1,000 | | ug/L | 3 | 3 | 1.5 |
| 680-142501-5 | SB-2017-DUP-1 | 8/21/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 5.7 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142501-5 | SB-2017-DUP-1 | 8/21/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 0.5 | J | mg/L | 1 | 1 | 0.4 |
| 680-142501-5 | SB-2017-DUP-1 | 8/21/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 5.4 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142501-5 | SB-2017-DUP-1 | 8/21/2017 | SM 2320B | Total/NA | | Alkalinity | 240 | | mg/L | 5 | 3.2 | 1.1 |

**SHL 2017 Drilling Validated Data - 142501**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142501-6 | SB-2017-08-57-59 | 8/22/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 110,000 | | ug/L | 50 | 50 | 17 |
| 680-142501-6 | SB-2017-08-57-59 | 8/22/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 3,400 | | ug/L | 10 | 3 | 1 |
| 680-142501-6 | SB-2017-08-57-59 | 8/22/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 5,200 | | ug/L | 3 | 3 | 1.5 |
| 680-142501-6 | SB-2017-08-57-59 | 8/22/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 8.4 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142501-6 | SB-2017-08-57-59 | 8/22/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.7 | | mg/L | 1 | 1 | 0.4 |
| 680-142501-6 | SB-2017-08-57-59 | 8/22/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.2 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142501-6 | SB-2017-08-57-59 | 8/22/2017 | SM 2320B | Total/NA | | Alkalinity | 220 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142501-7 | SB-2017-08-67-69 | 8/22/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 110,000 | | ug/L | 50 | 50 | 17 |
| 680-142501-7 | SB-2017-08-67-69 | 8/22/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,200 | | ug/L | 10 | 3 | 1 |
| 680-142501-7 | SB-2017-08-67-69 | 8/22/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3,500 | | ug/L | 3 | 3 | 1.5 |
| 680-142501-7 | SB-2017-08-67-69 | 8/22/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 17 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142501-7 | SB-2017-08-67-69 | 8/22/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.7 | | mg/L | 1 | 1 | 0.4 |
| 680-142501-7 | SB-2017-08-67-69 | 8/22/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.4 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142501-7 | SB-2017-08-67-69 | 8/22/2017 | SM 2320B | Total/NA | | Alkalinity | 230 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142501-8 | SB-2017-08-77-79 | 8/22/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 76,000 | | ug/L | 50 | 50 | 17 |
| 680-142501-8 | SB-2017-08-77-79 | 8/22/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,300 | | ug/L | 10 | 3 | 1 |
| 680-142501-8 | SB-2017-08-77-79 | 8/22/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 5,700 | | ug/L | 3 | 3 | 1.5 |
| 680-142501-8 | SB-2017-08-77-79 | 8/22/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 15 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142501-8 | SB-2017-08-77-79 | 8/22/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 8.4 | | mg/L | 1 | 1 | 0.4 |
| 680-142501-8 | SB-2017-08-77-79 | 8/22/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.6 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142501-8 | SB-2017-08-77-79 | 8/22/2017 | SM 2320B | Total/NA | | Alkalinity | 250 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142501-9 | SB-2017-08-87-89 | 8/22/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 48,000 | | ug/L | 50 | 50 | 17 |
| 680-142501-9 | SB-2017-08-87-89 | 8/22/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,400 | | ug/L | 10 | 3 | 1 |
| 680-142501-9 | SB-2017-08-87-89 | 8/22/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 6,500 | | ug/L | 3 | 3 | 1.5 |
| 680-142501-9 | SB-2017-08-87-89 | 8/22/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 13 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142501-9 | SB-2017-08-87-89 | 8/22/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 7.1 | | mg/L | 1 | 1 | 0.4 |
| 680-142501-9 | SB-2017-08-87-89 | 8/22/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.0 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142501-9 | SB-2017-08-87-89 | 8/22/2017 | SM 2320B | Total/NA | | Alkalinity | 230 | | mg/L | 5 | 3.2 | 1.1 |

Notes:

mg/l = milligram per liter

µg/L = microgram per liter

LOQ = Limit of Quantitation

LOD = Limit of Detection

DL = Method Detection Limit

**Dissolved Metals**
SW 846/6010C/6020A
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-142532-1 |
| Laboratory: Test America, Savannah, GA | Date: 09/08/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-142532-1 | SB-2017-09-52-54 | 8/24/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142532-2 | SB-2017-09-62-64 | 8/24/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142532-3 | SB-2017-10-22-24 | 8/24/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142532-4 | SB-2017-10-32-34 | 8/25/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142532-5 | SB-2017-10-42-44 | 8/25/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142532-6 | SB-2017-DUP-3 | 8/25/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142532-7 | SB-2017-10-52-54 | 8/25/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-142532-8 | SB-2017-10-62-64 | 8/25/2017 | Dissolved As, Fe, Mn | Groundwater |

Summary - Data validation was performed on the data for seven (7) groundwater profile samples and one (1) field duplicate sample collected from upgradient locations on 8/24 and 8/25/2017 during drilling activities at Shepley's Hill. All samples were submitted for dissolved metals analyses by Method SW846/6010C for iron and manganese and Method SW846/6020A for arsenic. Samples were filtered in the field and preserved for sample shipment.

Sample Delivery and Condition – All samples arrived at the laboratory on 8/26/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the 6-month holding time required for preserved aqueous samples.

*Qualification:* None required

Laboratory Control Sample – The LCS recoveries for the reported target analytes met all %R control limits.

*Qualification:* None required.

MS/MSD – Matrix spike samples were not submitted with this sample set.

*Qualification:* None required.

Method Blank – The method blanks associated and analyzed with these samples were non-detect for all target analytes.

*Qualification:* None required.

Field Duplicate – Sample SB-2017-DUP-3 (Lab Sample ID: 680-142532-6) was the field duplicate sample of SB-2017-10-42-44 (Lab Sample ID: 680-142532-5). Detected results were comparable for all analytes with RPDs less than 10%. FD sample results are summarized in the table below.

| Lab Sample ID | 680-142532-5 | 680-142532-6 | |
|---|---|---|---|
| Client Sample ID | SB-2017-10-42-44 | SB-2017-DUP-3 | |
| Collection Date | 8/25/2017 | 8/25/2017 | |
| Analyte | Result (µg/L) | Result (µg/L) | RPD (%) |
| Iron | 75,000 | 73,000 | 2.7 |
| Manganese | 2,400 | 2,300 | 4.3 |
| Arsenic | 25 | 24 | 4.1 |

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "PQL U." Analyte detections below the PQL were reported as J qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table -** The dissolved metals results reported in this SDG are acceptable as reported. No qualifications were required and the data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value | Lab Qualifier | Validated Value | Validation Qualifier |
|---|---|---|---|---|---|---|
| 680-142532-1 | SB-2017-09-52-54 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142532-2 | SB-2017-09-62-64 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142532-3 | SB-2017-10-22-24 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142532-4 | SB-2017-10-32-34 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142532-5 | SB-2017-10-42-44 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142532-6 | SB-2017-DUP-3 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142532-7 | SB-2017-10-52-54 | Dissolved As, Fe, Mn | No qualification needed. | | | |
| 680-142532-8 | SB-2017-10-62-64 | Dissolved As, Fe, Mn | No qualification needed. | | | |

**Miscellaneous Chemistry Parameters**
Alkalinity (SM2320B), Sulfate/Chloride (SW9056A) and Dissolved Organic Carbon (DOC) (SW9060)
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-142532-1 |
| Laboratory: Test America, Savannah, GA | Date: 09/08/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-142532-1 | SB-2017-09-52-54 | 8/24/2017 | Miscellaneous Parameters | Groundwater |
| 680-142532-2 | SB-2017-09-62-64 | 8/24/2017 | Miscellaneous Parameters | Groundwater |
| 680-142532-3 | SB-2017-10-22-24 | 8/24/2017 | Miscellaneous Parameters | Groundwater |
| 680-142532-4 | SB-2017-10-32-34 | 8/25/2017 | Miscellaneous Parameters | Groundwater |
| 680-142532-5 | SB-2017-10-42-44 | 8/25/2017 | Miscellaneous Parameters | Groundwater |
| 680-142532-6 | SB-2017-DUP-3 | 8/25/2017 | Miscellaneous Parameters | Groundwater |
| 680-142532-7 | SB-2017-10-52-54 | 8/25/2017 | Miscellaneous Parameters | Groundwater |
| 680-142532-8 | SB-2017-10-62-64 | 8/25/2017 | Miscellaneous Parameters | Groundwater |

Summary - Data validation was performed on the data for seven (7) groundwater profile samples and one (1) field duplicate sample collected from upgradient locations on 8/24 and 8/25/2017 during drilling activities at Shepley's Hill. All samples were submitted for the miscellaneous wet chemistry analyses listed above. Samples submitted for dissolved organic carbon (DOC) analyses were field filtered. The samples submitted for alkalinity and DOC analyses were shipped to Test America Denver for analysis.

Sample Delivery and Condition – All samples arrived at the laboratory on 8/27/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required.

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the respective holding times required for preserved aqueous samples.

*Qualification:* None required.

Method Blank –The method blanks for DOC, chloride and sulfate were free from contamination. Low level contamination was detected in the method blanks prepared and analyzed for alkalinity ranging from 3.16 and 3.01 mg/L. All reported alkalinity sample results were greater than ten times the blank levels.

*Qualification:* None required.

Laboratory Control Sample – The LCS %R results for all methods associated with these samples met the control limits.

*Qualification:* None required.

MS/MSD – Matrix spike samples were not submitted with this sample set.

*Qualification:* None required.

Field Duplicate – Sample SB-2017-DUP-3 (Lab Sample ID: 680-142532-6) was the field duplicate sample of SB-2017-10-42-44 (Lab Sample ID: 680-142532-5). Detected results were comparable for all analytes with RPDs less than 10%. FD sample results are summarized in the table below.

| Lab Sample ID | 680-142532-5 | 680-142532-6 | |
|---|---|---|---|
| Client Sample ID | SB-2017-10-42-44 | SB-2017-DUP-3 | |
| Collection Date | 8/25/2017 | 8/25/2017 | |
| **Analyte** | **Result (mg/L)** | **Result (mg/L)** | **RPD (%)** |
| Chloride | 17 | 17 | 0 |
| Sulfate | 5.0 | 4.9 | 2 |
| DOC | 7.6 | 7.6 | 0 |
| Alkalinity | 270 | 290 | 7.1 |

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "LOQ U." Analyte detections below the LOQ were reported as J-qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table** - The miscellaneous parameter results reported in this SDG are acceptable as reported. The data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value | Lab Qualifier | Validated Value | Validation Qualifier |
|---|---|---|---|---|---|---|
| 680-142532-1 | SB-2017-09-52-54 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142532-2 | SB-2017-09-62-64 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142532-3 | SB-2017-10-22-24 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142532-4 | SB-2017-10-32-34 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142532-5 | SB-2017-10-42-44 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142532-6 | SB-2017-DUP-3 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142532-7 | SB-2017-10-52-54 | Miscellaneous Parameters | No qualification needed. | | | |
| 680-142532-8 | SB-2017-10-62-64 | Miscellaneous Parameters | No qualification needed. | | | |

**SHL 2017 Drilling Validated Data - 142532**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142532-1 | SB-2017-09-52-54 | 8/24/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 72000 | | ug/L | 50 | 50 | 17 |
| 680-142532-1 | SB-2017-09-52-54 | 8/24/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 3200 | | ug/L | 10 | 3 | 1 |
| 680-142532-1 | SB-2017-09-52-54 | 8/24/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 140 | | ug/L | 3 | 3 | 1.5 |
| 680-142532-1 | SB-2017-09-52-54 | 8/24/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 38 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142532-1 | SB-2017-09-52-54 | 8/24/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.5 | | mg/L | 1 | 1 | 0.4 |
| 680-142532-1 | SB-2017-09-52-54 | 8/24/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 8.5 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142532-1 | SB-2017-09-52-54 | 8/24/2017 | SM 2320B | Total/NA | | Alkalinity | 450 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142532-2 | SB-2017-09-62-64 | 8/24/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 98000 | | ug/L | 50 | 50 | 17 |
| 680-142532-2 | SB-2017-09-62-64 | 8/24/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1900 | | ug/L | 10 | 3 | 1 |
| 680-142532-2 | SB-2017-09-62-64 | 8/24/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 900 | | ug/L | 3 | 3 | 1.5 |
| 680-142532-2 | SB-2017-09-62-64 | 8/24/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 22 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142532-2 | SB-2017-09-62-64 | 8/24/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 9.6 | | mg/L | 1 | 1 | 0.4 |
| 680-142532-2 | SB-2017-09-62-64 | 8/24/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142532-2 | SB-2017-09-62-64 | 8/24/2017 | SM 2320B | Total/NA | | Alkalinity | 240 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142532-3 | SB-2017-10-22-24 | 8/24/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 26,000 | | ug/L | 50 | 50 | 17 |
| 680-142532-3 | SB-2017-10-22-24 | 8/24/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,300 | | ug/L | 10 | 3 | 1 |
| 680-142532-3 | SB-2017-10-22-24 | 8/24/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 10 | | ug/L | 3 | 3 | 1.5 |
| 680-142532-3 | SB-2017-10-22-24 | 8/24/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 21 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142532-3 | SB-2017-10-22-24 | 8/24/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 1 | U | mg/L | 1 | 1 | 0.4 |
| 680-142532-3 | SB-2017-10-22-24 | 8/24/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 21 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142532-3 | SB-2017-10-22-24 | 8/24/2017 | SM 2320B | Total/NA | | Alkalinity | 360 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142532-4 | SB-2017-10-32-34 | 8/25/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 18,000 | | ug/L | 50 | 50 | 17 |
| 680-142532-4 | SB-2017-10-32-34 | 8/25/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 830 | | ug/L | 10 | 3 | 1 |
| 680-142532-4 | SB-2017-10-32-34 | 8/25/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 87 | | ug/L | 3 | 3 | 1.5 |
| 680-142532-4 | SB-2017-10-32-34 | 8/25/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 2.5 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142532-4 | SB-2017-10-32-34 | 8/25/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 5 | | mg/L | 1 | 1 | 0.4 |
| 680-142532-4 | SB-2017-10-32-34 | 8/25/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 5.2 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142532-4 | SB-2017-10-32-34 | 8/25/2017 | SM 2320B | Total/NA | | Alkalinity | 79 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142532-5 | SB-2017-10-42-44 | 8/25/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 75,000 | | ug/L | 50 | 50 | 17 |
| 680-142532-5 | SB-2017-10-42-44 | 8/25/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,400 | | ug/L | 10 | 3 | 1 |
| 680-142532-5 | SB-2017-10-42-44 | 8/25/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 25 | | ug/L | 3 | 3 | 1.5 |
| 680-142532-5 | SB-2017-10-42-44 | 8/25/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 17 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142532-5 | SB-2017-10-42-44 | 8/25/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 5 | | mg/L | 1 | 1 | 0.4 |
| 680-142532-5 | SB-2017-10-42-44 | 8/25/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 7.6 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142532-5 | SB-2017-10-42-44 | 8/25/2017 | SM 2320B | Total/NA | | Alkalinity | 270 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142532-6 | SB-2017-DUP-3 | 8/25/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 73,000 | | ug/L | 50 | 50 | 17 |
| 680-142532-6 | SB-2017-DUP-3 | 8/25/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 2,300 | | ug/L | 10 | 3 | 1 |
| 680-142532-6 | SB-2017-DUP-3 | 8/25/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 24 | | ug/L | 3 | 3 | 1.5 |

**SHL 2017 Drilling Validated Data - 142532**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-142532-6 | SB-2017-DUP-3 | 8/25/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 17 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142532-6 | SB-2017-DUP-3 | 8/25/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 4.9 | | mg/L | 1 | 1 | 0.4 |
| 680-142532-6 | SB-2017-DUP-3 | 8/25/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 7.6 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142532-6 | SB-2017-DUP-3 | 8/25/2017 | SM 2320B | Total/NA | | Alkalinity | 290 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142532-7 | SB-2017-10-52-54 | 8/25/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 15,000 | | ug/L | 50 | 50 | 17 |
| 680-142532-7 | SB-2017-10-52-54 | 8/25/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 4,800 | | ug/L | 10 | 3 | 1 |
| 680-142532-7 | SB-2017-10-52-54 | 8/25/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 33 | | ug/L | 3 | 3 | 1.5 |
| 680-142532-7 | SB-2017-10-52-54 | 8/25/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 45 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142532-7 | SB-2017-10-52-54 | 8/25/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 4.9 | | mg/L | 1 | 1 | 0.4 |
| 680-142532-7 | SB-2017-10-52-54 | 8/25/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 4.8 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142532-7 | SB-2017-10-52-54 | 8/25/2017 | SM 2320B | Total/NA | | Alkalinity | 250 | | mg/L | 5 | 3.2 | 1.1 |
| 680-142532-8 | SB-2017-10-62-64 | 8/25/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 75,000 | | ug/L | 50 | 50 | 17 |
| 680-142532-8 | SB-2017-10-62-64 | 8/25/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 670 | | ug/L | 10 | 3 | 1 |
| 680-142532-8 | SB-2017-10-62-64 | 8/25/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1,600 | | ug/L | 3 | 3 | 1.5 |
| 680-142532-8 | SB-2017-10-62-64 | 8/25/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 24 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-142532-8 | SB-2017-10-62-64 | 8/25/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 19 | | mg/L | 1 | 1 | 0.4 |
| 680-142532-8 | SB-2017-10-62-64 | 8/25/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-142532-8 | SB-2017-10-62-64 | 8/25/2017 | SM 2320B | Total/NA | | Alkalinity | 120 | | mg/L | 5 | 3.2 | 1.1 |

Notes:

mg/l = milligram per liter

µg/L = microgram per liter

LOQ = Limit of Quantitation

LOD = Limit of Detection

DL = Method Detection Limit

**Dissolved Metals**
SW 846/6010C/6020A
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-143134-1 |
| Laboratory: Test America, Savannah, GA | Date: 10/02/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-143134-1 | SB-2017-16-42-44 | 9/14/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-2 | SB-2017-16-52-54 | 9/14/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-3 | SB-2017-16-62-64 | 9/14/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-4 | SB-2017-18-82-84 | 9/13/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-5 | SB-2017-18-91-93 | 9/13/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-6 | SB-2017-15-22-24 | 9/14/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-7 | SB-2017-15-32-34 | 9/14/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-8 | SB-2017-15-37-39 | 9/14/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-9 | SB-2017-14-22-24 | 9/14/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-10 | SB-2017-16-32-34 | 9/13/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-11 | SB-2017-14-32-34 | 9/14/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-12 | SB-2017-13-22-24 | 9/15/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-13 | SB-2017-DUP-09 | 9/15/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-14 | SB-2017-13-32-34 | 9/15/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-15 | SB-2017-DUP-10 | 9/15/2017 | Dissolved As, Fe, Mn | Groundwater |
| 680-143134-16 | SB-2017-13-41-43 | 9/15/2017 | Dissolved As, Fe, Mn | Groundwater |

Summary - Data validation was performed on the data for fourteen (14) groundwater profile samples and two (2) field duplicate samples collected from downgradient locations on 9/13, 9/14 and 9/15/2017 during drilling activities at Shepley's Hill. All samples were submitted for dissolved metals analyses by Method SW846/6010C for iron and manganese and Method SW846/6020A for arsenic. Samples were filtered in the field and preserved for sample shipment.

Sample Delivery and Condition – All samples arrived at the laboratory on 9/16/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the 6-month holding time required for

preserved aqueous samples.

*Qualification:* None required

Laboratory Control Sample – The LCS recoveries for the reported target analytes met all %R control limits.

*Qualification:* None required.

MS/MSD – MS/MSD samples were not submitted with this sample set. The laboratory selected sample SB-2017-16-52-54 (Lab Sample ID: 680-143134-2) and sample SB-2017-18-82-84 (Lab Sample ID: 680-143134-4) to be spiked and analyzed as batch MS/MSD. The native sample results were greater than four (4) times the spike level for all spiked analytes; %Rs could not be calculated.

*Qualification:* None required.

Method Blank – The method blanks prepared and analyzed with these samples were non-detect for all target analytes.

*Qualification:* None required.

Field Duplicate – Two field duplicate samples were submitted with this sample set. Sample SB-2017-DUP-09 (Lab Sample ID: 680-143134-13) was the field duplicate sample of SB-2017-13-22-24 (Lab Sample ID: 680-143134-12) and sample SB-2017-DUP-10 (Lab Sample ID: 680-143143-15) was the field duplicate sample of SB-2017-13-32-34 (Lab Sample ID: 680-143134-14). The results for arsenic in both FD sample pairs were non-detect. The detected results for iron and manganese were comparable with % RPDs less than 10%. The FD sample results are summarized in the table below.

| Lab Sample ID | 680-143134-12 | 680-143134-13 | |
|---|---|---|---|
| Client Sample ID | SB-2017-13-22-24 | SB-2017-DUP-09 | |
| Collection Date | 9/15/2017 | 9/15/2017 | |
| Analyte | **Result (µg/L)** | **Result (µg/L)** | **RPD (%)** |
| Iron | 120 | 120 | 0 |
| Manganese | 86 | 90 | 4.5 |
| | 680-143134-14 | 680-143134-15 | |
| | SB-2017-13-32-34 | SB-2017-DUP-10 | |
| | 9/15/2017 | 9/15/2017 | |
| | **Result (µg/L)** | **Result (µg/L)** | **RPD (%)** |
| Iron | 870 | 880 | 1.1 |
| Manganese | 160 | 160 | 0 |

*Qualification:* None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "PQL U." Analyte detections below the PQL were reported as J qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table -** The dissolved metals results reported in this SDG are acceptable as reported and the data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value (µg/L) | Lab Qualifier | Validated Value | Validation Qualifier (µg/L) |
|---|---|---|---|---|---|---|
| 680-143134-1 | SB-2017-16-42-44 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-2 | SB-2017-16-52-54 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-3 | SB-2017-16-62-64 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-4 | SB-2017-18-82-84 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-5 | SB-2017-18-91-93 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-6 | SB-2017-15-22-24 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-7 | SB-2017-15-32-34 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-8 | SB-2017-15-37-39 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-9 | SB-2017-14-22-24 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-10 | SB-2017-16-32-34 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-11 | SB-2017-14-32-34 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-12 | SB-2017-13-22-24 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-13 | SB-2017-DUP-09 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-14 | SB-2017-13-32-34 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-15 | SB-2017-DUP-10 | Dissolved As, Fe, Mn | No qualifications needed. | | | |
| 680-143134-16 | SB-2017-13-41-43 | Dissolved As, Fe, Mn | No qualifications needed. | | | |

**Miscellaneous Chemistry Parameters**
Alkalinity (SM2320B), Sulfate/Chloride (SW9056A), Dissolved Organic Carbon (DOC) (SW9060), and pH (SW9040C)
USEPA Level II Review

| | |
|---|---|
| Site: Former Fort Devens, MA<br>Shepley's Hill Drilling - 2017 | SDG #: 680-143134-1 |
| Laboratory: Test America, Savannah, GA | Date: 10/02/2017 |
| KGS Reviewer: Laurie Ekes | Project: 1081 |

| Lab Sample ID | Client Sample ID | Date Sampled | Analysis | Matrix |
|---|---|---|---|---|
| 680-143134-1 | SB-2017-16-42-44 | 9/14/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-2 | SB-2017-16-52-54 | 9/14/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-3 | SB-2017-16-62-64 | 9/14/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-4 | SB-2017-18-82-84 | 9/13/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-5 | SB-2017-18-91-93 | 9/13/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-6 | SB-2017-15-22-24 | 9/14/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-7 | SB-2017-15-32-34 | 9/14/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-8 | SB-2017-15-37-39 | 9/14/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-9 | SB-2017-14-22-24 | 9/14/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-10 | SB-2017-16-32-34 | 9/13/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-11 | SB-2017-14-32-34 | 9/14/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-12 | SB-2017-13-22-24 | 9/15/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-13 | SB-2017-DUP-09 | 9/15/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-14 | SB-2017-13-32-34 | 9/15/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-15 | SB-2017-DUP-10 | 9/15/2017 | Miscellaneous Parameters | Groundwater |
| 680-143134-16 | SB-2017-13-41-43 | 9/15/2017 | Miscellaneous Parameters | Groundwater |

Summary - Data validation was performed on the data for fourteen (14) groundwater profile samples and two (2) field duplicate samples collected from downgradient locations on 9/13, 9/14 and 9/15/2017 during drilling activities at Shepley's Hill. All samples were submitted for the miscellaneous wet chemistry analyses listed above. Four samples were analyzed at the laboratory for pH to confirm erroneous field readings. Samples submitted for dissolved organic carbon (DOC) analyses were field filtered. The samples submitted for alkalinity and DOC analyses were shipped to Test America Denver for analysis.

Sample Delivery and Condition – All samples arrived at the laboratory on 9/16/2017 in acceptable condition and temperature and were properly preserved. Proper custody was documented. Sample IDs were reviewed on login confirmation reports from the laboratory; any discrepancies due to illegible COCs were corrected prior to sample reporting.

*Qualification:* None required.

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

*Qualification:* None required.

Holding Times – All samples were analyzed within the respective holding times required for preserved aqueous samples.

*Qualification:* None required.

Method Blank –The method blanks for DOC, chloride and sulfate were free from contamination. Low level contamination was detected in the method blanks prepared and analyzed for alkalinity at 2.72 and 3.2 mg/L. The alkalinity results for the majority of samples were greater than ten times the blank levels.

*Qualification:* The low-level results for alkalinity (12 mg/L and 13 mg/L) less than ten times the blank levels were qualified as non-detect in samples SB-2017-13-32-34 and SB-2017-DUP-10 (Lab Sample IDs: 680-143134-14 and -15) were qualified as non-detect.

Laboratory Control Sample – The LCS %R results for all methods associated with these samples met the control limits.

*Qualification:* None required.

MS/MSD – MS/MSD samples were not submitted with this sample set. Batch MS/MSD samples prepared and reported with this sample set were within control limits.

*Qualification:* None required.

Field Duplicate – Two field duplicate samples were submitted with this sample set. Sample SB-2017-DUP-09 (Lab Sample ID: 680-143134-13) was the field duplicate sample of SB-2017-13-22-24 (Lab Sample ID: 680-143134-12) and sample SB-2017-DUP-10 (Lab Sample ID: 680-143134-15) was the field duplicate sample of SB-2017-13-32-34 (Lab Sample ID: 680-143134-14). Detected results were comparable for all analytes with RPDs less than 20% with the exception of DOC in the FD sample pair SB-2017-13-22-24/SB-2017-DUP-09, which had an RPD of 62%. This discrepancy is likely due to the low level DOC results. FD sample results are summarized in the table below.

| Lab Sample ID | 680-143134-12 | 680-143134-13 | |
|---|---|---|---|
| Client Sample ID | SB-2017-13-22-24 | SB-2017-DUP-09 | |
| Collection Date | 9/15/2017 | 9/15/2017 | |
| Analyte | **Result (mg/L)** | **Result (mg/L)** | **RPD (%)** |
| Chloride | 130 | 130 | 0 |
| Sulfate | 9.9 | 9.8 | 1.0 |
| DOC | 0.58 | 1.1 | 62 |
| Alkalinity | 24 | 23 | 4.3 |
| | 680-143134-14 | 680-143134-15 | |
| | SB-2017-13-32-34 | SB-2017-DUP-10 | |
| | 9/15/2017 | 9/15/2017 | |
| | **Result (mg/L)** | **Result (mg/L)** | **RPD (%)** |
| Chloride | 340 | 340 | 0 |
| Sulfate | 5.3 | 5.2 | 1.9 |
| DOC | 0.50 | 0.49 | 2 |

*Qualification:* The DOC results in the FD sample pair SB-2017-13-22-24 and SB-2017-DUP-09 were qualified as estimated (J).

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "LOQ U." Analyte detections below the LOQ were reported as J-qualified results. These J qualifiers were retained unless superseded by a more severe qualifier.

*Qualification:* None required.

**Qualification Summary Table** - The miscellaneous parameter results reported in this SDG are acceptable with the noted qualifications and the data may be used for its intended purpose.

| Lab Sample ID | Client Sample ID | Analysis | Lab Value (mg/L) | Lab Qualifier | Validated Value | Validation Qualifier (mg/L) |
|---|---|---|---|---|---|---|
| 680-143134-1 | SB-2017-16-42-44 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143134-2 | SB-2017-16-52-54 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143134-3 | SB-2017-16-62-64 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143134-4 | SB-2017-18-82-84 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143134-5 | SB-2017-18-91-93 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143134-6 | SB-2017-15-22-24 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143134-7 | SB-2017-15-32-34 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143134-8 | SB-2017-15-37-39 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143134-9 | SB-2017-14-22-24 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143134-10 | SB-2017-16-32-34 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143134-11 | SB-2017-14-32-34 | Miscellaneous Parameters | No qualifications needed. | | | |
| 680-143134-12 | SB-2017-13-22-24 | DOC | 0.58 | J | 0.58 | J |
| 680-143134-13 | SB-2017-DUP-09 | DOC | 1.1 | | 1.1 | J |
| 680-143134-14 | SB-2017-13-32-34 | Alkalinity | 12 | B | 12 | U |
| 680-143134-15 | SB-2017-DUP-10 | Alkalinity | 13 | B | 13 | U |
| 680-143134-16 | SB-2017-13-41-43 | Miscellaneous Parameters | No qualifications needed. | | | |

**SHL 2017 Drilling Validated Data - 143134**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-143134-1 | SB-2017-16-42-44 | 9/14/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 32,000 | | ug/L | 50 | 50 | 17 |
| 680-143134-1 | SB-2017-16-42-44 | 9/14/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 980 | | ug/L | 10 | 3 | 1 |
| 680-143134-1 | SB-2017-16-42-44 | 9/14/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 420 | | ug/L | 3 | 3 | 1.5 |
| 680-143134-1 | SB-2017-16-42-44 | 9/14/2017 | 9040C | NA | | pH | 7.2 | | SU | | | |
| 680-143134-1 | SB-2017-16-42-44 | 9/14/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 4.7 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143134-1 | SB-2017-16-42-44 | 9/14/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.4 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-1 | SB-2017-16-42-44 | 9/14/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.7 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-1 | SB-2017-16-42-44 | 9/14/2017 | SM 2320B | Total/NA | | Alkalinity | 91 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-2 | SB-2017-16-52-54 | 9/14/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 41,000 | | ug/L | 50 | 50 | 17 |
| 680-143134-2 | SB-2017-16-52-54 | 9/14/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,400 | | ug/L | 10 | 3 | 1 |
| 680-143134-2 | SB-2017-16-52-54 | 9/14/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1,300 | | ug/L | 3 | 3 | 1.5 |
| 680-143134-2 | SB-2017-16-52-54 | 9/14/2017 | 9040C | NA | | pH | 7.3 | | SU | | | |
| 680-143134-2 | SB-2017-16-52-54 | 9/14/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 15 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143134-2 | SB-2017-16-52-54 | 9/14/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.8 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-2 | SB-2017-16-52-54 | 9/14/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.1 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-2 | SB-2017-16-52-54 | 9/14/2017 | SM 2320B | Total/NA | | Alkalinity | 190 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-3 | SB-2017-16-62-64 | 9/14/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 5,300 | | ug/L | 50 | 50 | 17 |
| 680-143134-3 | SB-2017-16-62-64 | 9/14/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 7,300 | | ug/L | 10 | 3 | 1 |
| 680-143134-3 | SB-2017-16-62-64 | 9/14/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1.7 | J | ug/L | 3 | 3 | 1.5 |
| 680-143134-3 | SB-2017-16-62-64 | 9/14/2017 | 9040C | NA | | pH | 7.7 | | SU | | | |
| 680-143134-3 | SB-2017-16-62-64 | 9/14/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 140 | | mg/L | 2 | 2 | 0.8 |
| 680-143134-3 | SB-2017-16-62-64 | 9/14/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 4.0 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-3 | SB-2017-16-62-64 | 9/14/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.1 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-3 | SB-2017-16-62-64 | 9/14/2017 | SM 2320B | Total/NA | | Alkalinity | 380 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-4 | SB-2017-18-82-84 | 9/13/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 41,000 | | ug/L | 50 | 50 | 17 |
| 680-143134-4 | SB-2017-18-82-84 | 9/13/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 7,600 | | ug/L | 10 | 3 | 1 |
| 680-143134-4 | SB-2017-18-82-84 | 9/13/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 94 | | ug/L | 3 | 3 | 1.5 |
| 680-143134-4 | SB-2017-18-82-84 | 9/13/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 22 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143134-4 | SB-2017-18-82-84 | 9/13/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.4 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-4 | SB-2017-18-82-84 | 9/13/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-4 | SB-2017-18-82-84 | 9/13/2017 | SM 2320B | Total/NA | | Alkalinity | 290 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-5 | SB-2017-18-91-93 | 9/13/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 15,000 | | ug/L | 50 | 50 | 17 |
| 680-143134-5 | SB-2017-18-91-93 | 9/13/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 4,100 | | ug/L | 10 | 3 | 1 |
| 680-143134-5 | SB-2017-18-91-93 | 9/13/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1.7 | J | ug/L | 3 | 3 | 1.5 |
| 680-143134-5 | SB-2017-18-91-93 | 9/13/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 40 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143134-5 | SB-2017-18-91-93 | 9/13/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 7.5 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-5 | SB-2017-18-91-93 | 9/13/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.5 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-5 | SB-2017-18-91-93 | 9/13/2017 | SM 2320B | Total/NA | | Alkalinity | 420 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-6 | SB-2017-15-22-24 | 9/14/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 29,000 | | ug/L | 50 | 50 | 17 |
| 680-143134-6 | SB-2017-15-22-24 | 9/14/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 4,800 | | ug/L | 10 | 3 | 1 |
| 680-143134-6 | SB-2017-15-22-24 | 9/14/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 550 | | ug/L | 3 | 3 | 1.5 |
| 680-143134-6 | SB-2017-15-22-24 | 9/14/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 85 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-6 | SB-2017-15-22-24 | 9/14/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 8.6 | | mg/L | 1 | 1 | 0.4 |

**SHL 2017 Drilling Validated Data - 143134**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-143134-6 | SB-2017-15-22-24 | 9/14/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.1 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-6 | SB-2017-15-22-24 | 9/14/2017 | SM 2320B | Total/NA | | Alkalinity | 51 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-7 | SB-2017-15-32-34 | 9/14/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 31,000 | | ug/L | 50 | 50 | 17 |
| 680-143134-7 | SB-2017-15-32-34 | 9/14/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 850 | | ug/L | 10 | 3 | 1 |
| 680-143134-7 | SB-2017-15-32-34 | 9/14/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1,300 | | ug/L | 3 | 3 | 1.5 |
| 680-143134-7 | SB-2017-15-32-34 | 9/14/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 12 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143134-7 | SB-2017-15-32-34 | 9/14/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.5 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-7 | SB-2017-15-32-34 | 9/14/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.8 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-7 | SB-2017-15-32-34 | 9/14/2017 | SM 2320B | Total/NA | | Alkalinity | 84 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-8 | SB-2017-15-37-39 | 9/14/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 53,000 | | ug/L | 50 | 50 | 17 |
| 680-143134-8 | SB-2017-15-37-39 | 9/14/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,500 | | ug/L | 10 | 3 | 1 |
| 680-143134-8 | SB-2017-15-37-39 | 9/14/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 2,100 | | ug/L | 3 | 3 | 1.5 |
| 680-143134-8 | SB-2017-15-37-39 | 9/14/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 17 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143134-8 | SB-2017-15-37-39 | 9/14/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.5 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-8 | SB-2017-15-37-39 | 9/14/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.3 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-8 | SB-2017-15-37-39 | 9/14/2017 | SM 2320B | Total/NA | | Alkalinity | 210 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-9 | SB-2017-14-22-24 | 9/14/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 28,000 | | ug/L | 50 | 50 | 17 |
| 680-143134-9 | SB-2017-14-22-24 | 9/14/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,500 | | ug/L | 10 | 3 | 1 |
| 680-143134-9 | SB-2017-14-22-24 | 9/14/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 2,000 | | ug/L | 3 | 3 | 1.5 |
| 680-143134-9 | SB-2017-14-22-24 | 9/14/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 39 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143134-9 | SB-2017-14-22-24 | 9/14/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.1 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-9 | SB-2017-14-22-24 | 9/14/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 2.0 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-9 | SB-2017-14-22-24 | 9/14/2017 | SM 2320B | Total/NA | | Alkalinity | 44 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-10 | SB-2017-16-32-34 | 9/13/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 3,500 | | ug/L | 50 | 50 | 17 |
| 680-143134-10 | SB-2017-16-32-34 | 9/13/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 570 | | ug/L | 10 | 3 | 1 |
| 680-143134-10 | SB-2017-16-32-34 | 9/13/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 260 | | ug/L | 3 | 3 | 1.5 |
| 680-143134-10 | SB-2017-16-32-34 | 9/13/2017 | 9040C | NA | | pH | 7.9 | | SU | | | |
| 680-143134-10 | SB-2017-16-32-34 | 9/13/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 76 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-10 | SB-2017-16-32-34 | 9/13/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.5 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-10 | SB-2017-16-32-34 | 9/13/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 3.4 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-10 | SB-2017-16-32-34 | 9/13/2017 | SM 2320B | Total/NA | | Alkalinity | 86 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-11 | SB-2017-14-32-34 | 9/14/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 5,500 | | ug/L | 50 | 50 | 17 |
| 680-143134-11 | SB-2017-14-32-34 | 9/14/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,700 | | ug/L | 10 | 3 | 1 |
| 680-143134-11 | SB-2017-14-32-34 | 9/14/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 490 | | ug/L | 3 | 3 | 1.5 |
| 680-143134-11 | SB-2017-14-32-34 | 9/14/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 4.7 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143134-11 | SB-2017-14-32-34 | 9/14/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 3.6 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-11 | SB-2017-14-32-34 | 9/14/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.6 | | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-11 | SB-2017-14-32-34 | 9/14/2017 | SM 2320B | Total/NA | | Alkalinity | 43 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-12 | SB-2017-13-22-24 | 9/15/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 120 | | ug/L | 50 | 50 | 17 |
| 680-143134-12 | SB-2017-13-22-24 | 9/15/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 86 | | ug/L | 10 | 3 | 1 |
| 680-143134-12 | SB-2017-13-22-24 | 9/15/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 1.5 | J | ug/L | 3 | 3 | 1.5 |
| 680-143134-12 | SB-2017-13-22-24 | 9/15/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 130 | | mg/L | 2 | 2 | 0.8 |
| 680-143134-12 | SB-2017-13-22-24 | 9/15/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 9.9 | | mg/L | 1 | 1 | 0.4 |

**SHL 2017 Drilling Validated Data - 143134**

| Lab Sample ID | Client Sample ID | Collection Date | Analysis Method | Prep Type | CAS | Analyte | Result | Flag | Unit | LOQ | LOD | DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680-143134-12 | SB-2017-13-22-24 | 9/15/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 0.58 | J | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-12 | SB-2017-13-22-24 | 9/15/2017 | SM 2320B | Total/NA | | Alkalinity | 24 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-13 | SB-2017-DUP-09 | 9/15/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 120 | | ug/L | 50 | 50 | 17 |
| 680-143134-13 | SB-2017-DUP-09 | 9/15/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 90 | | ug/L | 10 | 3 | 1 |
| 680-143134-13 | SB-2017-DUP-09 | 9/15/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3.0 | U | ug/L | 3 | 3 | 1.5 |
| 680-143134-13 | SB-2017-DUP-09 | 9/15/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 130 | | mg/L | 2 | 2 | 0.8 |
| 680-143134-13 | SB-2017-DUP-09 | 9/15/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 9.8 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-13 | SB-2017-DUP-09 | 9/15/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 1.1 | J | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-13 | SB-2017-DUP-09 | 9/15/2017 | SM 2320B | Total/NA | | Alkalinity | 23 | | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-14 | SB-2017-13-32-34 | 9/15/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 870 | | ug/L | 50 | 50 | 17 |
| 680-143134-14 | SB-2017-13-32-34 | 9/15/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 160 | | ug/L | 10 | 3 | 1 |
| 680-143134-14 | SB-2017-13-32-34 | 9/15/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3.0 | U | ug/L | 3 | 3 | 1.5 |
| 680-143134-14 | SB-2017-13-32-34 | 9/15/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 340 | | mg/L | 5 | 5 | 2 |
| 680-143134-14 | SB-2017-13-32-34 | 9/15/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 5.3 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-14 | SB-2017-13-32-34 | 9/15/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 0.50 | J | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-14 | SB-2017-13-32-34 | 9/15/2017 | SM 2320B | Total/NA | | Alkalinity | 12 | U | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-15 | SB-2017-DUP-10 | 9/15/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 880 | | ug/L | 50 | 50 | 17 |
| 680-143134-15 | SB-2017-DUP-10 | 9/15/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 160 | | ug/L | 10 | 3 | 1 |
| 680-143134-15 | SB-2017-DUP-10 | 9/15/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3.0 | U | ug/L | 3 | 3 | 1.5 |
| 680-143134-15 | SB-2017-DUP-10 | 9/15/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 340 | | mg/L | 5 | 5 | 2 |
| 680-143134-15 | SB-2017-DUP-10 | 9/15/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 5.2 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-15 | SB-2017-DUP-10 | 9/15/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 0.49 | J | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-15 | SB-2017-DUP-10 | 9/15/2017 | SM 2320B | Total/NA | | Alkalinity | 13 | U | mg/L | 5 | 3.2 | 1.1 |
| 680-143134-16 | SB-2017-13-41-43 | 9/15/2017 | 6010C | Dissolved | 7439-89-6 | Iron | 3,700 | | ug/L | 50 | 50 | 17 |
| 680-143134-16 | SB-2017-13-41-43 | 9/15/2017 | 6010C | Dissolved | 7439-96-5 | Manganese | 1,100 | | ug/L | 10 | 3 | 1 |
| 680-143134-16 | SB-2017-13-41-43 | 9/15/2017 | 6020A | Dissolved | 7440-38-2 | Arsenic | 3.7 | | ug/L | 3 | 3 | 1.5 |
| 680-143134-16 | SB-2017-13-41-43 | 9/15/2017 | 9056A | Total/NA | 16887-00-6 | Chloride | 6.5 | | mg/L | 0.5 | 0.5 | 0.2 |
| 680-143134-16 | SB-2017-13-41-43 | 9/15/2017 | 9056A | Total/NA | 14808-79-8 | Sulfate | 2.7 | | mg/L | 1 | 1 | 0.4 |
| 680-143134-16 | SB-2017-13-41-43 | 9/15/2017 | 9060 | Dissolved | 7440-44-0 | Dissolved Organic Carbon | 0.64 | J | mg/L | 1 | 0.5 | 0.16 |
| 680-143134-16 | SB-2017-13-41-43 | 9/15/2017 | SM 2320B | Total/NA | | Alkalinity | 24 | | mg/L | 5 | 3.2 | 1.1 |

Notes:

mg/l = milligram per liter

µg/L = microgram per liter

LOQ = Limit of Quantitation

LOD = Limit of Detection

DL = Method Detection Limit

Qualified Result

**LABORATORY DATA CONSULTANTS, INC.**
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 19, 2021

SUBJECT: Fort Devens, Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 1, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #49830:**

| **SDG #** | **Fraction** |
|---|---|
| 680-190620-1, 680-190870-1<br>680-190885-1, 680-190931-1<br>680-191084-1, 680-190870-2<br>680-191084-2, 680-191377-2 | Volatiles, Organochlorine Pesticides, Dissolved Metals, Alkalinity, Wet Chemistry |

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Former Fort Devens Army Installation – BRAC Legacy Sites, Devens, MA; October 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

262 pages-ADV 2 WEEK TAT Attachment 1

**Stage 2B EQUIS EDD**

# LDC #49830 (Arcadis-Millersville, MD / Fort Devens)

| LDC | SDG# | DATE REC'D | (3) DATE DUE | VOA (8260B) | | Pest. (8081B) | | Metals (6010C/ 6020A) | | Alk. (2320B) | | DOC (9060A) | | Cl,$SO_4$ (9056A) | | COD (410.4) | | CN (9012B) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix: Water/Soil | | | | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
| A | 680-190620-1 | 12/01/20 | 12/15/20 | - | - | - | - | 8 | 0 | 8 | 0 | 8 | 0 | 8 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| B | 680-190870-1 | 12/01/20 | 12/15/20 | - | - | - | - | 13 | 0 | 13 | 0 | 13 | 0 | 13 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| C | 680-190885-1 | 12/01/20 | 12/15/20 | - | - | - | - | 6 | 0 | 6 | 0 | 6 | 0 | 6 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| D | 680-190931-1 | 12/01/20 | 12/15/20 | - | - | - | - | 12 | 0 | 12 | 0 | 12 | 0 | 12 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| E | 680-191084-1 | 12/01/20 | 12/15/20 | - | - | - | - | 12 | 0 | 12 | 0 | 12 | 0 | 12 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| F | 680-190870-2 | 12/01/20 | 12/15/20 | 2 | 0 | - | - | - | - | - | - | - | - | - | - | 1 | 0 | 1 | 0 | | | | | | | | | | | | | | | | | | | | |
| G | 680-191084-2 | 12/01/20 | 12/15/20 | - | - | 1 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| H | 680-191377-2 | 12/01/20 | 12/15/20 | - | - | - | - | 5 | 0 | 5 | 0 | - | - | 5 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| Total | J/PG | | | 2 | 0 | 1 | 0 | 56 | 0 | 56 | 0 | 51 | 0 | 56 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 224 |

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

L:\Arcadis\Fort Devens\49830ST.wpd

## Data Validation Report for 6801906201

| | |
|---|---|
| Facility: | Former Fort Devens, Long Term Monitoring |
| Event: | Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| SDG: | 6801906201 |
| Guidance Document: | Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 |
| Prime Contractor: | Seres-Arcadis JV |
| Project Manager: | Jennifer Singer |
| Contract Laboratory(ies): | Eurofins Environment Testing TestAmerica, Arvada, CO |
| Data Review Contractor: | Laboratory Data Consultants, Inc. |
| Data Review Level: | 2B |
| Primary Data Reviewer: | Kevin Kha, Environmental Scientist |
| Second Reviewer: | Pei Geng, Senior Scientist |
| Date Submitted: | December 14, 2020 |

| Field Sample ID | Lab Sample ID | Matrix | Type/Type Code | A2320B | SW6010C - Dissolved | SW6020A - Dissolved | SW9056A | SW9060A - Dissolved |
|---|---|---|---|---|---|---|---|---|
| PZ-12-09-FAL20 | 680-190620-1 | Water | Field Sample/N | X | X | X | X | X |
| PZ-12-10-FAL20 | 680-190620-2 | Water | Field Sample/N | X | X | X | X | X |
| SHL-19-FAL20 | 680-190620-3 | Water | Field Sample/N | X | X | X | X | X |
| SHL-24-FAL20 | 680-190620-5 | Water | Field Sample/N | X | X | X | X | X |
| SHL-DUP09-FAL20 | 680-190620-6 | Water | Field Duplicate/FD | X | X | X | X | X |
| SHM-05-39A-FAL20 | 680-190620-7 | Water | Field Sample/N | X | X | X | X | X |
| SHM-05-39B-FAL20 | 680-190620-8 | Water | Field Sample/N | X | X | X | X | X |
| SHM-93-24A-FAL20 | 680-190620-4 | Water | Field Sample/N | X | X | X | X | X |

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO and were reported under sample delivery group (SDG) 6801906201. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 2 results (3.57%) out of the 56 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency. Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

| Analytical Method | Data Reviewer Comment |
|---|---|
| SW6010C | No additional comments; see Checklist for detail. |
| SW9060A | No additional comments; see Checklist for detail. |
| SW6020A | No additional comments; see Checklist for detail. |
| SW9056A | No additional comments; see Checklist for detail. |
| A2320B | No additional comments; see Checklist for detail. |

December 14, 2020

Reviewed by Kevin Kha, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of a minimum of 10% of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 16, 2021

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

**Quality Control Outliers for test method SW6010C, Dissolved, Lab Blank**

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| MB6806414251A (LB)/ MB6806414251A | Iron | 19.70 | < 17 | < 50 | ug/l | U/None | L | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW6010C, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| PZ-12-10-FAL20 (SD)/ 680-190620-2 | Iron | 85.20 | 87 - 115 | 10 - 125 | percent | J/UJ | M | |
| PZ-12-10-FAL20 (SD)/ 680-190620-2 | Manganese | 86.25 | 90 - 114 | 10 - 125 | percent | J/UJ | M | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the MS Recovery for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| PZ-12-10-FAL20 | N | Iron | 50.0 | 50.0 U J | 50.0 UJ | | ug/l | M |
| PZ-12-10-FAL20 | N | Manganese | 10.0 | 3.00 U J | 3.00 UJ | | ug/l | M |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Table of All Qualified Results**

| **Test Method: SW6010C** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| PZ-12-10-FAL20 | N | Iron | 50.0 | 50.0 U J | 50.0 UJ | | ug/l | M |
| PZ-12-10-FAL20 | N | Manganese | 10.0 | 3.00 U J | 3.00 UJ | | ug/l | M |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

**Reason Code Definitions**

| Code | Definition |
|---|---|
| L | Lab Blank |
| M | MS Recovery |
| TR | Trace Level Detect |

**Flag Code and Definitions**

| Flag | Definition |
|---|---|
| U | Undetected: The analyte was analyzed for, but not detected. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| R | The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making. |
| B | Blank contamination: The analyte was found in an associated blank above one half the RL, as well as in the sample. |
| UB | The analyte was also detected in an associated laboratory or field blank at a concentration comparable to the concentration in the sample. The reported result has been requalified as not detected. |
| X | The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended. |

**Review Questions**

| Method: A2320B (Alkalinity by Titrimetric Method) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | Although a LCS was not prepared with batch 515502, a CCV was prepared and analyzed with the batch. CCV recoveries were within acceptance criteria. |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | | | • | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801906201

### Review Questions

| Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Although iron was detected in the method blank, the associated sample results were not detected or were significantly greater than the concentrations found in the blanks, therefore no data were qualified. |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Due to low MSD %R, iron and manganese results were qualified as non-detected estimated (UJ) as applicable in sample PZ-12-10-FAL20. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

## Data Validation Report for 6801906201

### Review Questions

| Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801906201

### Review Questions

| Method: SW9056A (Anion Chromatography) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | • | | | |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801906201

### Review Questions

| Method: SW9060A (Total Organic Carbon) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

**LABORATORY DATA CONSULTANTS, INC.**
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 19, 2021

SUBJECT: Fort Devens, Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 1, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #49830:**

| **SDG #** | **Fraction** |
|---|---|
| 680-190620-1, 680-190870-1<br>680-190885-1, 680-190931-1<br>680-191084-1, 680-190870-2<br>680-191084-2, 680-191377-2 | Volatiles, Organochlorine Pesticides, Dissolved Metals, Alkalinity, Wet Chemistry |

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Former Fort Devens Army Installation – BRAC Legacy Sites, Devens, MA; October 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

262 pages-ADV 2 WEEK TAT Attachment 1

**Stage 2B EQUIS EDD**

# LDC #49830 (Arcadis-Millersville, MD / Fort Devens)

| LDC | SDG# | DATE REC'D | (3) DATE DUE | VOA (8260B) | | Pest. (8081B) | | Metals (6010C/ 6020A) | | Alk. (2320B) | | DOC (9060A) | | Cl,$SO_4$ (9056A) | | COD (410.4) | | CN (9012B) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix: Water/Soil | | | | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
| A | 680-190620-1 | 12/01/20 | 12/15/20 | - | - | - | - | 8 | 0 | 8 | 0 | 8 | 0 | 8 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| B | 680-190870-1 | 12/01/20 | 12/15/20 | - | - | - | - | 13 | 0 | 13 | 0 | 13 | 0 | 13 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| C | 680-190885-1 | 12/01/20 | 12/15/20 | - | - | - | - | 6 | 0 | 6 | 0 | 6 | 0 | 6 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| D | 680-190931-1 | 12/01/20 | 12/15/20 | - | - | - | - | 12 | 0 | 12 | 0 | 12 | 0 | 12 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| E | 680-191084-1 | 12/01/20 | 12/15/20 | - | - | - | - | 12 | 0 | 12 | 0 | 12 | 0 | 12 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| F | 680-190870-2 | 12/01/20 | 12/15/20 | 2 | 0 | - | - | - | - | - | - | - | - | - | - | 1 | 0 | 1 | 0 | | | | | | | | | | | | | | | | | | | | |
| G | 680-191084-2 | 12/01/20 | 12/15/20 | - | - | 1 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| H | 680-191377-2 | 12/01/20 | 12/15/20 | - | - | - | - | 5 | 0 | 5 | 0 | - | - | 5 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| Total | J/PG | | | 2 | 0 | 1 | 0 | 56 | 0 | 56 | 0 | 51 | 0 | 56 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 224 |

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

L:\Arcadis\Fort Devens\49830ST.wpd

## Data Validation Report for 6801908701

| | |
|---|---|
| Facility: | Former Fort Devens, Long Term Monitoring |
| Event: | Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| SDG: | 6801908701 |
| Guidance Document: | Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 |
| Prime Contractor: | Seres-Arcadis JV |
| Project Manager: | Jennifer Singer |
| Contract Laboratory(ies): | Eurofins Environment Testing TestAmerica, Arvada, CO |
| Data Review Contractor: | Laboratory Data Consultants, Inc. |
| Data Review Level: | 2B |
| Primary Data Reviewer: | Kevin Kha, Environmental Scientist |
| Second Reviewer: | Pei Geng, Senior Scientist |
| Date Submitted: | December 14, 2020 |

| Field Sample ID | Lab Sample ID | Matrix | Type/Type Code | A2320B | SW6010C - Dissolved | SW6020A - Dissolved | SW9056A | SW9060A - Dissolved |
|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-1A-FAL20 | 680-190870-8 | Water | Field Sample/N | X | X | X | X | X |
| EPA-PZ-2012-1B-FAL20 | 680-190870-9 | Water | Field Sample/N | X | X | X | X | X |
| EPA-PZ-2012-4A-FAL20 | 680-190870-10 | Water | Field Sample/N | X | X | X | X | X |
| EPA-PZ-2012-4B-FAL20 | 680-190870-11 | Water | Field Sample/N | X | X | X | X | X |
| EW-01-FAL20 | 680-190870-12 | Water | Field Sample/N | X | X | X | X | X |
| EW-04-FAL20 | 680-190870-13 | Water | Field Sample/N | X | X | X | X | X |
| N5-P1-FAL20 | 680-190870-14 | Water | Field Sample/N | X | X | X | X | X |
| SHL-DUP05-FAL20 | 680-190870-7 | Water | Field Duplicate/FD | X | X | X | X | X |
| SHM-10-06-FAL20 | 680-190870-4 | Water | Field Sample/N | X | X | X | X | X |
| SHM-10-13-FAL20 | 680-190870-5 | Water | Field Sample/N | X | X | X | X | X |
| SHM-99-31B-FAL20 | 680-190870-1 | Water | Field Sample/N | X | X | X | X | X |
| SHM-99-31C-FAL20 | 680-190870-2 | Water | Field Sample/N | X | X | X | X | X |
| SHM-99-32X-FAL20 | 680-190870-3 | Water | Field Sample/N | X | X | X | X | X |

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO and were reported under sample delivery group (SDG) 6801908701. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 7 results (7.69%) out of the 91 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency. Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

| Analytical Method | Data Reviewer Comment |
|---|---|
| SW6020A | No additional comments; see Checklist for detail. |
| SW6010C | No additional comments; see Checklist for detail. |
| SW9056A | No additional comments; see Checklist for detail. |
| A2320B | No additional comments; see Checklist for detail. |
| SW9060A | No additional comments; see Checklist for detail. |

December 14, 2020

Reviewed by Kevin Kha, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of a minimum of 10% of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 16, 2021

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

No Outliers were associated with this sample delivery group.

Qualified Results

No results associated with this  sample delivery group required qualification.

**Table of Results with Modified Qualifiers**

**Modified Qualifiers for test method SW9060A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | ADR Result | Modified Result | Reason |
|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-1A-FAL20 | N | Dissolved Organic Carbon | 1.80 | 1.80 | 1.80 | 1.80 U | B2 |
| EPA-PZ-2012-4A-FAL20 | N | Dissolved Organic Carbon | 1.80 | 1.80 | 1.80 | 1.80 U | B2 |
| EW-04-FAL20 | N | Dissolved Organic Carbon | 1.90 | 1.90 | 1.90 | 1.90 U | B2 |
| N5-P1-FAL20 | N | Dissolved Organic Carbon | 1.20 | 1.20 | 1.20 | 1.20 U | B2 |
| SHM-10-06-FAL20 | N | Dissolved Organic Carbon | 1.90 | 1.90 | 1.90 | 1.90 U | B2 |
| SHM-99-31C-FAL20 | N | Dissolved Organic Carbon | 1.90 | 1.90 | 1.90 | 1.90 U | B2 |
| SHM-99-32X-FAL20 | N | Dissolved Organic Carbon | 1.20 | 1.20 | 1.20 | 1.20 U | B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Reason Code Definitions**

| Code | Definition |
|---|---|
| B2 | CCB |
| TR | Trace Level Detect |

**Flag Code and Definitions**

| Flag | Definition |
|---|---|
| U | Undetected: The analyte was analyzed for, but not detected. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| R | The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making. |
| B | Blank contamination: The analyte was found in an associated blank above one half the RL, as well as in the sample. |
| UB | The analyte was also detected in an associated laboratory or field blank at a concentration comparable to the concentration in the sample. The reported result has been requalified as not detected. |
| X | The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended. |

**Review Questions**

| Method: A2320B (Alkalinity by Titrimetric Method) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | | | • | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801908701

### Review Questions

| Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801908701

### Review Questions

| Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801908701

### Review Questions

| Method: SW9056A (Anion Chromatography) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | • | | | |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported |

## Data Validation Report for 6801908701

### Review Questions

| Method: SW9060A (Total Organic Carbon) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to CCB contamination, seven Dissolved Organic Carbon results were qualified as non-detected (U). |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

**Field Duplicate Report By SDG**
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020
Field Duplicates for SDG: 6801908701

| Location | Analysis |
|---|---|
| EPA-PZ-2012-4B | A2320B |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-4B-FAL20 / SHL-DUP05-FAL20 | 680-190870-11 / 680-190870-7 | Alkalinity, Total (as CaCO3) | 140 | 160 | 10.0 | 13.3 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| EPA-PZ-2012-4B | SW6010C |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-4B-FAL20 / SHL-DUP05-FAL20 | 680-190870-11 / 680-190870-7 | Iron (FLDFLT) | 59000 | 57000 | 50.0 | 3.45 | 30 | OK | NA |
| EPA-PZ-2012-4B-FAL20 / SHL-DUP05-FAL20 | 680-190870-11 / 680-190870-7 | Manganese (FLDFLT) | 780 | 760 | 10.0 | 2.60 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| EPA-PZ-2012-4B | SW6020A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-4B-FAL20 / SHL-DUP05-FAL20 | 680-190870-11 / 680-190870-7 | Arsenic (FLDFLT) | 2000 | 1900 | 3.00 | 5.13 | 30 | OK | NA |

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

**LABORATORY DATA CONSULTANTS, INC.**
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 19, 2021

SUBJECT: Fort Devens, Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 1, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #49830:**

| **SDG #** | **Fraction** |
|---|---|
| 680-190620-1, 680-190870-1<br>680-190885-1, 680-190931-1<br>680-191084-1, 680-190870-2<br>680-191084-2, 680-191377-2 | Volatiles, Organochlorine Pesticides, Dissolved Metals, Alkalinity, Wet Chemistry |

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Former Fort Devens Army Installation – BRAC Legacy Sites, Devens, MA; October 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

262 pages-ADV 2 WEEK TAT Attachment 1

**Stage 2B EQUIS EDD**

# LDC #49830 (Arcadis-Millersville, MD / Fort Devens)

| LDC | SDG# | DATE REC'D | (3) DATE DUE | VOA (8260B) | | Pest. (8081B) | | Metals (6010C/ 6020A) | | Alk. (2320B) | | DOC (9060A) | | Cl,$SO_4$ (9056A) | | COD (410.4) | | CN (9012B) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix: Water/Soil | | | | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
| A | 680-190620-1 | 12/01/20 | 12/15/20 | - | - | - | - | 8 | 0 | 8 | 0 | 8 | 0 | 8 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| B | 680-190870-1 | 12/01/20 | 12/15/20 | - | - | - | - | 13 | 0 | 13 | 0 | 13 | 0 | 13 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| C | 680-190885-1 | 12/01/20 | 12/15/20 | - | - | - | - | 6 | 0 | 6 | 0 | 6 | 0 | 6 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| D | 680-190931-1 | 12/01/20 | 12/15/20 | - | - | - | - | 12 | 0 | 12 | 0 | 12 | 0 | 12 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| E | 680-191084-1 | 12/01/20 | 12/15/20 | - | - | - | - | 12 | 0 | 12 | 0 | 12 | 0 | 12 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| F | 680-190870-2 | 12/01/20 | 12/15/20 | 2 | 0 | - | - | - | - | - | - | - | - | - | - | 1 | 0 | 1 | 0 | | | | | | | | | | | | | | | | | | | | |
| G | 680-191084-2 | 12/01/20 | 12/15/20 | - | - | 1 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| H | 680-191377-2 | 12/01/20 | 12/15/20 | - | - | - | - | 5 | 0 | 5 | 0 | - | - | 5 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| Total | J/PG | | | 2 | 0 | 1 | 0 | 56 | 0 | 56 | 0 | 51 | 0 | 56 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 224 |

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

L:\Arcadis\Fort Devens\49830ST.wpd

## Data Validation Report for 6801908851

| | |
|---|---|
| Facility: | Former Fort Devens, Long Term Monitoring |
| Event: | Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| SDG: | 6801908851 |
| Guidance Document: | Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 |
| Prime Contractor: | Seres-Arcadis JV |
| Project Manager: | Jennifer Singer |
| Contract Laboratory(ies): | Eurofins Environment Testing TestAmerica, Arvada, CO |
| Data Review Contractor: | Laboratory Data Consultants, Inc. |
| Data Review Level: | 2B |
| Primary Data Reviewer: | Kevin Kha, Environmental Scientist |
| Second Reviewer: | Pei Geng, Senior Scientist |
| Date Submitted: | December 14, 2020 |

| Field Sample ID | Lab Sample ID | Matrix | Type/Type Code | A2320B | SW6010C - Dissolved | SW6020A - Dissolved | SW9056A | SW9060A - Dissolved |
|---|---|---|---|---|---|---|---|---|
| SHL-11-FAL20 | 680-190885-1 | Water | Field Sample/N | X | X | X | X | X |
| SHL-20-FAL20 | 680-190885-2 | Water | Field Sample/N | X | X | X | X | X |
| SHM-13-03-FAL20 | 680-190885-3 | Water | Field Sample/N | X | X | X | X | X |
| SHM-13-14D-FAL20 | 680-190885-4 | Water | Field Sample/N | X | X | X | X | X |
| SHM-13-14S-FAL20 | 680-190885-5 | Water | Field Sample/N | X | X | X | X | X |
| SHM-13-15-FAL20 | 680-190885-6 | Water | Field Sample/N | X | X | X | X | X |

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO and were reported under sample delivery group (SDG) 6801908851. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 1 results (2.38%) out of the 42 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency. Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

| Analytical Method | Data Reviewer Comment |
|---|---|
| SW6020A | No additional comments; see Checklist for detail. |
| SW9060A | No additional comments; see Checklist for detail. |
| A2320B | No additional comments; see Checklist for detail. |
| SW9056A | No additional comments; see Checklist for detail. |
| SW6010C | No additional comments; see Checklist for detail. |

December 14, 2020

Reviewed by Kevin Kha, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of a minimum of 10% of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 16, 2021

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

**Quality Control Outliers for test method SW6010C, Dissolved, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB680642498244 (CB)/ CCB680642498244 | Iron | 18.10 | < 17 | < 50 | ug/l | U/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Calibration Blank for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-13-14D-FAL20 | N | Iron | 50.0 | 37.0 J | 50.0 U | | ug/l | B2/L |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

# Data Validation Report for 6801908851

## Quality Control Outliers for test method SW6010C, Dissolved, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| MB6806421291A (LB)/ MB6806421291A | Iron | 18.20 | < 17 | < 50 | ug/l | U/None | L | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

## Qualified Results associated with the Lab Blank for SW6010C, Dissolved

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-13-14D-FAL20 | N | Iron | 50.0 | 37.0 J | 50.0 U | | ug/l | B2/L |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6010C, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHL-11-FAL20 (SD)/ 680-190885-1 | Manganese | 115.0 | 90 - 114 | 10 - 125 | percent | J/None | M | Spike amount Insignificant |
| SHL-11-FAL20 (MS)/ 680-190885-1 | Manganese | 125.0 | 90 - 114 | 10 - 125 | percent | J/None | M | Spike amount Insignificant |
| SHL-11-FAL20 (SD)/ 680-190885-1 | Iron | 132.0 | 87 - 115 | 10 - 125 | percent | J/None | M | Spike amount Insignificant |
| SHL-11-FAL20 (MS)/ 680-190885-1 | Iron | 148.0 | 87 - 115 | 10 - 125 | percent | J/None | M | Spike amount Insignificant |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW6020A, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHL-11-FAL20 (SD)/ 680-190885-1 | Arsenic | 150.0 | 84 - 116 | 10 - 125 | percent | J/None | M | Spike amount Insignificant |
| SHL-11-FAL20 (MS)/ 680-190885-1 | Arsenic | 70.00 | 84 - 116 | 10 - 125 | percent | J/UJ | M | Spike amount Insignificant |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Table of All Qualified Results**

| **Test Method: SW6010C** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| SHM-13-14D-FAL20 | N | Iron | 50.0 | 37.0 J | 50.0 U | | ug/l | B2/L |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

**Reason Code Definitions**

| Code | Definition |
|---|---|
| B2 | CCB |
| L | Lab Blank |
| M | MS Recovery |
| TR | Trace Level Detect |

**Flag Code and Definitions**

| Flag | Definition |
|---|---|
| U | Undetected: The analyte was analyzed for, but not detected. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| R | The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making. |
| B | Blank contamination: The analyte was found in an associated blank above one half the RL, as well as in the sample. |
| UB | The analyte was also detected in an associated laboratory or field blank at a concentration comparable to the concentration in the sample. The reported result has been requalified as not detected. |
| X | The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended. |

**Review Questions**

| Method: A2320B (Alkalinity by Titrimetric Method) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | | | • | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801908851

### Review Questions

| Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to method blank and calibration blank contamination, the iron result in sample SHM-13 -14D-FAL20 was qualified as non-detected (U). |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Although iron and manganese %R were not within acceptance limits, no data were qualified since parent sample concentrations were significantly greater (>4X) than the spike amount. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801908851

### Review Questions

| Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Although arsenic %R was not within acceptance limits, no data were qualified since parent sample concentrations were significantly greater (>4X) than the spike amount. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801908851

### Review Questions

| Method: SW9056A (Anion Chromatography) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | • | | | |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | | | • | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801908851

### Review Questions

| Method: SW9060A (Total Organic Carbon) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

**LABORATORY DATA CONSULTANTS, INC.**
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 19, 2021

SUBJECT: Fort Devens, Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 1, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #49830:**

| **SDG #** | **Fraction** |
|---|---|
| 680-190620-1, 680-190870-1<br>680-190885-1, 680-190931-1<br>680-191084-1, 680-190870-2<br>680-191084-2, 680-191377-2 | Volatiles, Organochlorine Pesticides, Dissolved Metals, Alkalinity, Wet Chemistry |

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Former Fort Devens Army Installation – BRAC Legacy Sites, Devens, MA; October 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

262 pages-ADV 2 WEEK TAT Attachment 1

**Stage 2B EQUIS EDD**

# LDC #49830 (Arcadis-Millersville, MD / Fort Devens)

| LDC | SDG# | DATE REC'D | (3) DATE DUE | VOA (8260B) | | Pest. (8081B) | | Metals (6010C/ 6020A) | | Alk. (2320B) | | DOC (9060A) | | Cl,$SO_4$ (9056A) | | COD (410.4) | | CN (9012B) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix: Water/Soil | | | | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
| A | 680-190620-1 | 12/01/20 | 12/15/20 | - | - | - | - | 8 | 0 | 8 | 0 | 8 | 0 | 8 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| B | 680-190870-1 | 12/01/20 | 12/15/20 | - | - | - | - | 13 | 0 | 13 | 0 | 13 | 0 | 13 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| C | 680-190885-1 | 12/01/20 | 12/15/20 | - | - | - | - | 6 | 0 | 6 | 0 | 6 | 0 | 6 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| D | 680-190931-1 | 12/01/20 | 12/15/20 | - | - | - | - | 12 | 0 | 12 | 0 | 12 | 0 | 12 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| E | 680-191084-1 | 12/01/20 | 12/15/20 | - | - | - | - | 12 | 0 | 12 | 0 | 12 | 0 | 12 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| F | 680-190870-2 | 12/01/20 | 12/15/20 | 2 | 0 | - | - | - | - | - | - | - | - | - | - | 1 | 0 | 1 | 0 | | | | | | | | | | | | | | | | | | | | |
| G | 680-191084-2 | 12/01/20 | 12/15/20 | - | - | 1 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| H | 680-191377-2 | 12/01/20 | 12/15/20 | - | - | - | - | 5 | 0 | 5 | 0 | - | - | 5 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| Total | J/PG | | | 2 | 0 | 1 | 0 | 56 | 0 | 56 | 0 | 51 | 0 | 56 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 224 |

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

L:\Arcadis\Fort Devens\49830ST.wpd

# Data Validation Report for 6801909311

| | |
|---|---|
| Facility: | Former Fort Devens, Long Term Monitoring |
| Event: | Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| SDG: | 6801909311 |
| Guidance Document: | Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 |
| Prime Contractor: | Seres-Arcadis JV |
| Project Manager: | Jennifer Singer |
| Contract Laboratory(ies): | Eurofins Environment Testing TestAmerica, Arvada, CO |
| Data Review Contractor: | Laboratory Data Consultants, Inc. |
| Data Review Level: | 2B |
| Primary Data Reviewer: | Kevin Kha, Environmental Scientist |
| Second Reviewer: | Pei Geng, Senior Scientist |
| Date Submitted: | December 14, 2020 |

| Field Sample ID | Lab Sample ID | Matrix | Type/Type Code | A2320B | SW6010C - Dissolved | SW6020A - Dissolved | SW9056A | SW9060A - Dissolved |
|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-3A-FAL20 | 680-190931-1 | Water | Field Sample/N | X | X | X | X | X |
| EPA-PZ-2012-3B-FAL20 | 680-190931-2 | Water | Field Sample/N | X | X | X | X | X |
| PZ-12-01-FAL20 | 680-190931-3 | Water | Field Sample/N | X | X | X | X | X |
| PZ-12-02-FAL20 | 680-190931-4 | Water | Field Sample/N | X | X | X | X | X |
| PZ-12-03-FAL20 | 680-190931-5 | Water | Field Sample/N | X | X | X | X | X |
| SHL-15-FAL20 | 680-190931-6 | Water | Field Sample/N | X | X | X | X | X |
| SHL-DUP03-FAL20 | 680-190931-7 | Water | Field Duplicate/FD | X | X | X | X | X |
| SHM-10-15-FAL20 | 680-190931-8 | Water | Field Sample/N | X | X | X | X | X |
| SHM-11-06-FAL20 | 680-190931-9 | Water | Field Sample/N | X | X | X | X | X |
| SHM-99-31A-FAL20 | 680-190931-10 | Water | Field Sample/N | X | X | X | X | X |
| SHP-2016-3A-FAL20 | 680-190931-11 | Water | Field Sample/N | X | X | X | X | X |
| SHP-99-29X-FAL20 | 680-190931-12 | Water | Field Sample/N | X | X | X | X | X |

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO and were reported under sample delivery group (SDG) 6801909311. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- Lab Replicate RPD
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 3 results (3.57%) out of the 84 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency. Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

| Analytical Method | Data Reviewer Comment |
|---|---|
| SW6020A | No additional comments; see Checklist for detail. |
| SW9056A | No additional comments; see Checklist for detail. |
| A2320B | No additional comments; see Checklist for detail. |
| SW9060A | No additional comments; see Checklist for detail. |
| SW6010C | Due to serial dilution %D, iron and manganese in sample SHM-11-06-FAL20 were qualified as detected estimated (J). |

December 14, 2020

Reviewed by Kevin Kha, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of a minimum of 10% of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 16, 2021

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

**Quality Control Outliers for test method A2320B, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB28051638717 (CB)/ CCB28051638717 | Alkalinity, Total (as CaCO3) | 4.740 | < 3.1 | < 10 | mg/l | U/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method A2320B, Lab Blank**

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| MB28051638731 (LB)/ MB28051638731 | Alkalinity, Total (as CaCO3) | 5.110 | < 3.1 | < 10 | mg/l | U/None | L | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Lab Blank for A2320B**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-99-31A-FAL20 | N | Alkalinity, Total (as CaCO3) | 14.0 | 14.0 B | 14.0 U | | mg/l | L |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6010C, Dissolved, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB68064297059 (CB)/ CCB68064297059 | Iron | 20.80 | < 17 | < 50 | ug/l | U/None | B2 | |
| CCB680643776142 (CB)/ CCB680643776142 | Iron | 23.90 | < 17 | < 50 | ug/l | U/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW6010C, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHM-11-06-FAL20 (MS)/ 680-190931-9 | Iron | 80.00 | 87 - 115 | 10 - 125 | percent | J/UJ | M | Spike amount Insignificant |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW6020A, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHM-11-06-FAL20 (SD)/ 680-190931-9 | Arsenic | 129.0 | 84 - 116 | 10 - 125 | percent | J/None | M | Spike amount Insignificant |
| SHM-11-06-FAL20 (MS)/ 680-190931-9 | Arsenic | 136.0 | 84 - 116 | 10 - 125 | percent | J/None | M | Spike amount Insignificant |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Table of All Qualified Results**

**Test Method: A2320B Extraction Method: NONE**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-99-31A-FAL20 | N | Alkalinity, Total (as CaCO3) | 14.0 | 14.0 B | 14.0 U | | mg/l | L |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Table of Results with Modified Qualifiers**

**Modified Qualifiers for test method A2320B**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | ADR Result | Modified Result | Reason |
|---|---|---|---|---|---|---|---|
| SHM-99-31A-FAL20 | N | Alkalinity, Total (as CaCO3) | 14.0 | 14.0 B | 14.0 J | 14.0 U | L |

**Modified Qualifiers for test method SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | ADR Result | Modified Result | Reason |
|---|---|---|---|---|---|---|---|
| SHM-11-06-FAL20 | N | Iron | 50.0 | 62000 J | 62000 | 62000 J | A |
| SHM-11-06-FAL20 | N | Manganese | 10.0 | 1600 | 1600 | 1600 J | A |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Reason Code Definitions**

| Code | Definition |
|---|---|
| A | Serial dilution |
| B2 | CCB |
| L | Lab Blank |
| M | MS Recovery |
| TR | Trace Level Detect |

**Flag Code and Definitions**

| Flag | Definition |
|---|---|
| U | Undetected: The analyte was analyzed for, but not detected. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| R | The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making. |
| B | Blank contamination: The analyte was found in an associated blank above one half the RL, as well as in the sample. |
| UB | The analyte was also detected in an associated laboratory or field blank at a concentration comparable to the concentration in the sample. The reported result has been requalified as not detected. |
| X | The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended. |

## Data Validation Report for 6801909311

**Review Questions**

| Method: A2320B (Alkalinity by Titrimetric Method) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to method blank contamination, 1 alkalinity result was qualified as not detected (U). |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | | • | | |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | A DUP was prepared and analyzed for alkalinity. RPD was within project limits. |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

## Data Validation Report for 6801909311

### Review Questions

| Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Although iron was detected in the calibration blanks, the associated sample results were significantly greater than the concentration found in the calibration blanks, therefore no data were qualified. |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Although iron %R was not within acceptance limits, no data were qualified since sample concentrations were significantly greater (>4X) than the spike amount. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

**Review Questions**

| Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Although arsenic %R was not within acceptance limits, no data were qualified since sample concentrations were significantly greater (>4X) than the spike amount. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801909311

### Review Questions

| Method: SW9056A (Anion Chromatography) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | • | | | |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801909311

### Review Questions

| Method: SW9060A (Total Organic Carbon) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020
Field Duplicates for SDG: 6801909311

| Location | Analysis |
|---|---|
| SHM-11-06 | A2320B |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-11-06-FAL20 / SHL-DUP03-FAL20 | 680-190931-9 / 680-190931-7 | Alkalinity, Total (as CaCO3) | 150 | 150 | 10.0 | 0.00 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHM-11-06 | SW6010C |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-11-06-FAL20 / SHL-DUP03-FAL20 | 680-190931-9 / 680-190931-7 | Iron (FLDFLT) | 62000 | 56000 | 50.0 | 10.2 | 30 | OK | NA |
| SHM-11-06-FAL20 / SHL-DUP03-FAL20 | 680-190931-9 / 680-190931-7 | Manganese (FLDFLT) | 1600 | 1400 | 10.0 | 13.3 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHM-11-06 | SW6020A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-11-06-FAL20 / SHL-DUP03-FAL20 | 680-190931-9 / 680-190931-7 | Arsenic (FLDFLT) | 620 | 680 | 3.00 | 9.23 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHM-11-06 | SW9056A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-11-06-FAL20 / SHL-DUP03-FAL20 | 680-190931-9 / 680-190931-7 | Chloride | 55.0 | 55.0 | 0.500 | 0.00 | 30 | OK | NA |
| SHM-11-06-FAL20 / SHL-DUP03-FAL20 | 680-190931-9 / 680-190931-7 | Sulfate | 9.60 | 9.30 | 1.00 | 3.17 | 30 | OK | NA |

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

**Field Duplicate Report By SDG**
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020
Field Duplicates for SDG: 6801909311

| Location | Analysis |
|---|---|
| SHM-11-06 | SW9060A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-11-06-FAL20 / SHL-DUP03-FAL20 | 680-190931-9 / 680-190931-7 | Dissolved Organic Carbon (FLDFLT) | 1.80 | 1.70 | 1.00 | 5.71 | 30 | NA | OK |

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

**LABORATORY DATA CONSULTANTS, INC.**
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 19, 2021

SUBJECT: Fort Devens, Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 1, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #49830:**

| **SDG #** | **Fraction** |
|---|---|
| 680-190620-1, 680-190870-1<br>680-190885-1, 680-190931-1<br>680-191084-1, 680-190870-2<br>680-191084-2, 680-191377-2 | Volatiles, Organochlorine Pesticides, Dissolved Metals, Alkalinity, Wet Chemistry |

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Former Fort Devens Army Installation – BRAC Legacy Sites, Devens, MA; October 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

262 pages-ADV 2 WEEK TAT Attachment 1

**Stage 2B EQUIS EDD**

# LDC #49830 (Arcadis-Millersville, MD / Fort Devens)

| LDC | SDG# | DATE REC'D | (3) DATE DUE | VOA (8260B) | | Pest. (8081B) | | Metals (6010C/ 6020A) | | Alk. (2320B) | | DOC (9060A) | | Cl,$SO_4$ (9056A) | | COD (410.4) | | CN (9012B) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix: Water/Soil | | | | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
| A | 680-190620-1 | 12/01/20 | 12/15/20 | - | - | - | - | 8 | 0 | 8 | 0 | 8 | 0 | 8 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| B | 680-190870-1 | 12/01/20 | 12/15/20 | - | - | - | - | 13 | 0 | 13 | 0 | 13 | 0 | 13 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| C | 680-190885-1 | 12/01/20 | 12/15/20 | - | - | - | - | 6 | 0 | 6 | 0 | 6 | 0 | 6 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| D | 680-190931-1 | 12/01/20 | 12/15/20 | - | - | - | - | 12 | 0 | 12 | 0 | 12 | 0 | 12 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| E | 680-191084-1 | 12/01/20 | 12/15/20 | - | - | - | - | 12 | 0 | 12 | 0 | 12 | 0 | 12 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| F | 680-190870-2 | 12/01/20 | 12/15/20 | 2 | 0 | - | - | - | - | - | - | - | - | - | - | 1 | 0 | 1 | 0 | | | | | | | | | | | | | | | | | | | | |
| G | 680-191084-2 | 12/01/20 | 12/15/20 | - | - | 1 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| H | 680-191377-2 | 12/01/20 | 12/15/20 | - | - | - | - | 5 | 0 | 5 | 0 | - | - | 5 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| Total | J/PG | | | 2 | 0 | 1 | 0 | 56 | 0 | 56 | 0 | 51 | 0 | 56 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 224 |

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

L:\Arcadis\Fort Devens\49830ST.wpd

## Data Validation Report for 6801910841

| | |
|---|---|
| Facility: | Former Fort Devens, Long Term Monitoring |
| Event: | Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| SDG: | 6801910841 |
| Guidance Document: | Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 |
| Prime Contractor: | Seres-Arcadis JV |
| Project Manager: | Jennifer Singer |
| Contract Laboratory(ies): | Eurofins Environment Testing TestAmerica, Arvada, CO |
| Data Review Contractor: | Laboratory Data Consultants, Inc. |
| Data Review Level: | 2B |
| Primary Data Reviewer: | Kevin Kha, Environmental Scientist |
| Second Reviewer: | Pei Geng, Senior Scientist |
| Date Submitted: | December 14, 2020 |

| Field Sample ID | Lab Sample ID | Matrix | Type/Type Code | A2320B | SW6010C - Dissolved | SW6020A - Dissolved | SW9056A | SW9060A - Dissolved |
|---|---|---|---|---|---|---|---|---|
| PZ-12-04-FAL20 | 680-191084-1 | Water | Field Sample/N | X | X | X | X | X |
| PZ-12-05-FAL20 | 680-191084-2 | Water | Field Sample/N | X | X | X | X | X |
| PZ-12-06-FAL20 | 680-191084-3 | Water | Field Sample/N | X | X | X | X | X |
| SHL-12-FAL20 | 680-191084-4 | Water | Field Sample/N | X | X | X | X | X |
| SHL-22-FAL20 | 680-191084-5 | Water | Field Sample/N | X | X | X | X | X |
| SHL-7-FAL20 | 680-191084-6 | Water | Field Sample/N | X | X | X | X | X |
| SHL-9-FAL20 | 680-191084-7 | Water | Field Sample/N | X | X | X | X | X |
| SHL-DUP07-FAL20 | 680-191084-8 | Water | Field Duplicate/FD | X | X | X | X | X |
| SHM-11-02-FAL20 | 680-191084-9 | Water | Field Sample/N | X | X | X | X | X |
| SHM-93-22B-FAL20 | 680-191084-10 | Water | Field Sample/N | X | X | X | X | X |
| SHM-93-22C-FAL20 | 680-191084-11 | Water | Field Sample/N | X | X | X | X | X |
| SHP-2016-3B-FAL20 | 680-191084-12 | Water | Field Sample/N | X | X | X | X | X |

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO and were reported under sample delivery group (SDG) 6801910841. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- Lab Replicate RPD
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 15 results (17.86%) out of the 84 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency. Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

| Analytical Method | Data Reviewer Comment |
|---|---|
| SW6020A | No additional comments; see Checklist for detail. |
| SW9056A | No additional comments; see Checklist for detail. |
| SW9060A | No additional comments; see Checklist for detail. |
| A2320B | No additional comments; see Checklist for detail. |
| SW6010C | No additional comments; see Checklist for detail. |

December 14, 2020

Reviewed by Kevin Kha, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of a minimum of 10% of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 16, 2021

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

**Quality Control Outliers for test method SW6010C, Dissolved, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB68064352710 (CB)/ CCB68064352710 | Iron | 24.50 | < 17 | < 50 | ug/l | U/None | B2 | |
| CCB68064352722 (CB)/ CCB68064352722 | Iron | 24.50 | < 17 | < 50 | ug/l | U/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Calibration Blank for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHL-22-FAL20 | N | Iron | 50.0 | 40.0 J | 50.0 U | | ug/l | B2/L |
| SHL-DUP07-FAL20 | FD | Iron | 50.0 | 46.0 J | 50.0 U | | ug/l | B2/L |
| SHM-93-22C-FAL20 | N | Iron | 50.0 | 30.0 J | 50.0 U | | ug/l | B2/L |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6010C, Dissolved, Lab Blank**

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| MB6806429361A (LB)/ MB6806429361A | Iron | 17.10 | < 17 | < 50 | ug/l | U/None | L | |
| MB6806429361A (LB)/ MB6806429361A | Manganese | 2.740 | < 1 | < 10 | ug/l | U/None | L | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Lab Blank for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHL-22-FAL20 | N | Iron | 50.0 | 40.0 J | 50.0 U | | ug/l | B2/L |
| SHL-DUP07-FAL20 | FD | Iron | 50.0 | 46.0 J | 50.0 U | | ug/l | B2/L |
| SHM-93-22C-FAL20 | N | Iron | 50.0 | 30.0 J | 50.0 U | | ug/l | B2/L |
| SHM-93-22C-FAL20 | N | Manganese | 10.0 | 3.20 J | 10.0 U | | ug/l | L |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6010C, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| PZ-12-04-FAL20 (MS)/ 680-191084-1 | Iron | 72.00 | 87 - 115 | 10 - 125 | percent | J/UJ | M | Spike amount Insignificant |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW6020A, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| PZ-12-04-FAL20 (MS)/ 680-191084-1 | Arsenic | 39.00 | 84 - 116 | 10 - 125 | percent | J/UJ | M | Spike amount Insignificant |
| PZ-12-04-FAL20 (SD)/ 680-191084-1 | Arsenic | 5.000 | 84 - 116 | 10 - 125 | percent | J/X | M | Spike amount Insignificant |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Table of All Qualified Results**

| **Test Method: SW6010C** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| SHL-22-FAL20 | N | Iron | 50.0 | 40.0 J | 50.0 U | | ug/l | B2/L |
| SHL-DUP07-FAL20 | FD | Iron | 50.0 | 46.0 J | 50.0 U | | ug/l | B2/L |
| SHM-93-22C-FAL20 | N | Iron | 50.0 | 30.0 J | 50.0 U | | ug/l | B2/L |
| SHM-93-22C-FAL20 | N | Manganese | 10.0 | 3.20 J | 10.0 U | | ug/l | L |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Table of Results with Modified Qualifiers**

**Modified Qualifiers for test method SW9060A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | ADR Result | Modified Result | Reason |
|---|---|---|---|---|---|---|---|
| PZ-12-04-FAL20 | N | Dissolved Organic Carbon | 2.30 | 2.30 | 2.30 | 2.30 U | B2 |
| PZ-12-05-FAL20 | N | Dissolved Organic Carbon | 2.30 | 2.30 | 2.30 | 2.30 U | B2 |
| PZ-12-06-FAL20 | N | Dissolved Organic Carbon | 1.50 | 1.50 | 1.50 | 1.50 U | B2 |
| SHL-12-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 | 1.70 U | B2 |
| SHL-22-FAL20 | N | Dissolved Organic Carbon | 1.50 | 1.50 | 1.50 | 1.50 U | B2 |
| SHL-7-FAL20 | N | Dissolved Organic Carbon | 1.00 | 1.00 | 1.00 | 1.00 U | B2 |
| SHL-DUP07-FAL20 | FD | Dissolved Organic Carbon | 1.40 | 1.40 | 1.40 | 1.40 U | B2 |
| SHM-11-02-FAL20 | N | Dissolved Organic Carbon | 1.30 | 1.30 | 1.30 | 1.30 U | B2 |
| SHM-93-22B-FAL20 | N | Dissolved Organic Carbon | 1.40 | 1.40 | 1.40 | 1.40 U | B2 |
| SHM-93-22C-FAL20 | N | Dissolved Organic Carbon | 2.80 | 2.80 | 2.80 | 2.80 U | B2 |
| SHP-2016-3B-FAL20 | N | Dissolved Organic Carbon | 1.90 | 1.90 | 1.90 | 1.90 U | B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Reason Code Definitions**

| Code | Definition |
|---|---|
| B2 | CCB |
| L | Lab Blank |
| M | MS Recovery |
| TR | Trace Level Detect |

**Flag Code and Definitions**

| Flag | Definition |
|---|---|
| U | Undetected: The analyte was analyzed for, but not detected. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| R | The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making. |
| B | Blank contamination: The analyte was found in an associated blank above one half the RL, as well as in the sample. |
| UB | The analyte was also detected in an associated laboratory or field blank at a concentration comparable to the concentration in the sample. The reported result has been requalified as not detected. |
| X | The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended. |

**Review Questions**

| Method: A2320B (Alkalinity by Titrimetric Method) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | A DUP was prepared and analyzed for Alkalinity. The RPD was within project acceptance limits. |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801910841

### Review Questions

| Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to method blank and calibration blank contamination, three iron results and one manganese result were qualified as not detected (U). |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Although iron and manganese %R were not within acceptance limits, no data were qualified since sample concentrations were significantly greater (>4X) than the spike amount. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

**Review Questions**

| Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Although arsenic %R was not within project acceptance limits, no data were qualified since sample concentrations were significantly greater (>4X) than the spike amount. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801910841

### Review Questions

| Method: SW9056A (Anion Chromatography) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | • | | | |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

**Review Questions**

| Method: SW9060A (Total Organic Carbon) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to calibration blank contamination, 11 DOC results were qualified as not detected (U). |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

**Field Duplicate Report By SDG**
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020
Field Duplicates for SDG: 6801910841

| Location | Analysis |
|---|---|
| SHL-22 | A2320B |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHL-22-FAL20 / SHL-DUP07-FAL20 | 680-191084-5 / 680-191084-8 | Alkalinity, Total (as CaCO3) | 320 | 320 | 10.0 | 0.00 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHL-22 | SW6010C |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHL-22-FAL20 / SHL-DUP07-FAL20 | 680-191084-5 / 680-191084-8 | Iron (FLDFLT) | ND | ND | 50.0 | NA | 30 | NA | OK |
| SHL-22-FAL20 / SHL-DUP07-FAL20 | 680-191084-5 / 680-191084-8 | Manganese (FLDFLT) | 7700 | 8200 | 10.0 | 6.29 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHL-22 | SW6020A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHL-22-FAL20 / SHL-DUP07-FAL20 | 680-191084-5 / 680-191084-8 | Arsenic (FLDFLT) | 2.40 | 2.20 | 3.00 | 8.70 | 30 | NA | OK |

| Location | Analysis |
|---|---|
| SHL-22 | SW9056A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHL-22-FAL20 / SHL-DUP07-FAL20 | 680-191084-5 / 680-191084-8 | Chloride | 29.0 | 29.0 | 0.500 | 0.00 | 30 | OK | NA |
| SHL-22-FAL20 / SHL-DUP07-FAL20 | 680-191084-5 / 680-191084-8 | Sulfate | 8.90 | 8.90 | 1.00 | 0.00 | 30 | OK | NA |

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

**Field Duplicate Report By SDG**
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020
Field Duplicates for SDG: 6801910841

| Location | Analysis |
|---|---|
| SHL-22 | SW9060A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHL-22-FAL20 / SHL-DUP07-FAL20 | 680-191084-5 / 680-191084-8 | Dissolved Organic Carbon (FLDFLT) | ND | ND | 1.50 | NA | 30 | NA | OK |

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

**LABORATORY DATA CONSULTANTS, INC.**
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 19, 2021

SUBJECT: Fort Devens, Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 1, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #49830:**

| **SDG #** | **Fraction** |
|---|---|
| 680-190620-1, 680-190870-1<br>680-190885-1, 680-190931-1<br>680-191084-1, 680-190870-2<br>680-191084-2, 680-191377-2 | Volatiles, Organochlorine Pesticides, Dissolved Metals, Alkalinity, Wet Chemistry |

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Former Fort Devens Army Installation – BRAC Legacy Sites, Devens, MA; October 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

262 pages-ADV 2 WEEK TAT Attachment 1

**Stage 2B EQUIS EDD**

# LDC #49830 (Arcadis-Millersville, MD / Fort Devens)

| LDC | SDG# | DATE REC'D | (3) DATE DUE | VOA (8260B) | | Pest. (8081B) | | Metals (6010C/ 6020A) | | Alk. (2320B) | | DOC (9060A) | | Cl,$SO_4$ (9056A) | | COD (410.4) | | CN (9012B) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix: Water/Soil | | | | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
| A | 680-190620-1 | 12/01/20 | 12/15/20 | - | - | - | - | 8 | 0 | 8 | 0 | 8 | 0 | 8 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| B | 680-190870-1 | 12/01/20 | 12/15/20 | - | - | - | - | 13 | 0 | 13 | 0 | 13 | 0 | 13 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| C | 680-190885-1 | 12/01/20 | 12/15/20 | - | - | - | - | 6 | 0 | 6 | 0 | 6 | 0 | 6 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| D | 680-190931-1 | 12/01/20 | 12/15/20 | - | - | - | - | 12 | 0 | 12 | 0 | 12 | 0 | 12 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| E | 680-191084-1 | 12/01/20 | 12/15/20 | - | - | - | - | 12 | 0 | 12 | 0 | 12 | 0 | 12 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| F | 680-190870-2 | 12/01/20 | 12/15/20 | 2 | 0 | - | - | - | - | - | - | - | - | - | - | 1 | 0 | 1 | 0 | | | | | | | | | | | | | | | | | | | | |
| G | 680-191084-2 | 12/01/20 | 12/15/20 | - | - | 1 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| H | 680-191377-2 | 12/01/20 | 12/15/20 | - | - | - | - | 5 | 0 | 5 | 0 | - | - | 5 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | |
| Total | J/PG | | | 2 | 0 | 1 | 0 | 56 | 0 | 56 | 0 | 51 | 0 | 56 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 224 |

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

L:\Arcadis\Fort Devens\49830ST.wpd

## Data Validation Report for 6801913772

| | |
|---|---|
| Facility: | Former Fort Devens, Long Term Monitoring |
| Event: | Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| SDG: | 6801913772 |
| Guidance Document: | Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 |
| Prime Contractor: | Seres-Arcadis JV |
| Project Manager: | Jennifer Singer |
| Contract Laboratory(ies): | Eurofins Environment Testing TestAmerica, Arvada, CO |
| Data Review Contractor: | Laboratory Data Consultants, Inc. |
| Data Review Level: | 2B |
| Primary Data Reviewer: | Kevin Kha, Environmental Scientist |
| Second Reviewer: | Pei Geng, Senior Scientist |
| Date Submitted: | December 14, 2020 |

| Field Sample ID | Lab Sample ID | Matrix | Type/Type Code | A2320B | SW6010C - Dissolved | SW6020A - Dissolved | SW9056A |
|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-5A-FAL20 | 680-191377-1 | Water | Field Sample/N | X | X | X | X |
| EPA-PZ-2012-5B-FAL20 | 680-191377-2 | Water | Field Sample/N | X | X | X | X |
| SHL-DUP08-FAL20 | 680-191377-5 | Water | Field Duplicate/FD | X | X | X | X |
| SHM-96-5B-FAL20 | 680-191377-12 | Water | Field Sample/N | X | X | X | X |
| SHM-96-5C-FAL20 | 680-191377-13 | Water | Field Sample/N | X | X | X | X |

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO and were reported under sample delivery group (SDG) 6801913772. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- Lab Replicate RPD
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 1 results (3.33%) out of the 30 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency. Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

| Analytical Method | Data Reviewer Comment |
|---|---|
| SW6020A | No additional comments; see Checklist for detail. |
| SW6010C | No additional comments; see Checklist for detail. |
| SW9056A | No additional comments; see Checklist for detail. |
| A2320B | No additional comments; see Checklist for detail. |

December 14, 2020

Reviewed by Kevin Kha, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of a minimum of 10% of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 16, 2021

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

**Quality Control Outliers for test method A2320B, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB28051729929 (CB)/ CCB28051729929 | Alkalinity, Total (as CaCO3) | 3.700 | < 3.1 | < 10 | mg/l | U/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

# Data Validation Report for 6801913772

## Quality Control Outliers for test method SW6010C, Dissolved, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-5A-FAL20 (SD)/ 680-191377-1 | Iron | 81.80 | 87 - 115 | 10 - 125 | percent | J/UJ | M | |
| EPA-PZ-2012-5A-FAL20 (MS)/ 680-191377-1 | Iron | 86.00 | 87 - 115 | 10 - 125 | percent | J/UJ | M | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

## Qualified Results associated with the MS Recovery for SW6010C, Dissolved

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-5A-FAL20 | N | Iron | 50.0 | 5800 J | 5800 J | - | ug/l | M |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Table of All Qualified Results**

| **Test Method: SW6010C** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| EPA-PZ-2012-5A-FAL20 | N | Iron | 50.0 | 5800 J | 5800 J | - | ug/l | M |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

**Reason Code Definitions**

| Code | Definition |
|---|---|
| B2 | CCB |
| M | MS Recovery |
| TR | Trace Level Detect |

**Flag Code and Definitions**

| Flag | Definition |
|---|---|
| U | Undetected: The analyte was analyzed for, but not detected. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| R | The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making. |
| B | Blank contamination: The analyte was found in an associated blank above one half the RL, as well as in the sample. |
| UB | The analyte was also detected in an associated laboratory or field blank at a concentration comparable to the concentration in the sample. The reported result has been requalified as not detected. |
| X | The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended. |

**Review Questions**

| Method: A2320B (Alkalinity by Titrimetric Method) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Although the calibration blank had detections for alkalinity, the associated sample results were significantly greater than the concentration found in the calibration blank, therefore no data were qualified. |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | A DUP was prepared and analyzed for alkalinity. The RPD was within project acceptance limits. |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801913772

### Review Questions

| Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Due to MS/MSD %R below acceptance limits, one iron result was qualified as detected estimated (J) with a low bias (-). |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

## Data Validation Report for 6801913772

### Review Questions

| Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801913772

### Review Questions

| Method: SW9056A (Anion Chromatography) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | • | | | |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020
Field Duplicates for SDG: 6801913772

| Location | Analysis |
|---|---|
| SHM-96-5B | A2320B |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-96-5B-FAL20 / SHL-DUP08-FAL20 | 680-191377-12 / 680-191377-5 | Alkalinity, Total (as CaCO3) | 210 | 210 | 10.0 | 0.00 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHM-96-5B | SW6010C |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-96-5B-FAL20 / SHL-DUP08-FAL20 | 680-191377-12 / 680-191377-5 | Iron (FLDFLT) | 8600 | 8000 | 50.0 | 7.23 | 30 | OK | NA |
| SHM-96-5B-FAL20 / SHL-DUP08-FAL20 | 680-191377-12 / 680-191377-5 | Manganese (FLDFLT) | 7900 | 7900 | 10.0 | 0.00 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHM-96-5B | SW6020A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-96-5B-FAL20 / SHL-DUP08-FAL20 | 680-191377-12 / 680-191377-5 | Arsenic (FLDFLT) | 720 | 640 | 3.00 | 11.8 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHM-96-5B | SW9056A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-96-5B-FAL20 / SHL-DUP08-FAL20 | 680-191377-12 / 680-191377-5 | Chloride | 35.0 | 35.0 | 0.500 | 0.00 | 30 | OK | NA |
| SHM-96-5B-FAL20 / SHL-DUP08-FAL20 | 680-191377-12 / 680-191377-5 | Sulfate | 16.0 | 16.0 | 1.00 | 0.00 | 30 | OK | NA |

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

**LABORATORY DATA CONSULTANTS, INC.**
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 19, 2021

SUBJECT: Fort Devens, Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 2, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #49841:**

| **SDG #** | **Fraction** |
|---|---|
| 680-191150-1, 680-191218-1<br>680-191554-1 | Dissolved Metals, Wet Chemistry |

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Former Fort Devens Army Installation – BRAC Legacy Sites, Devens, MA; October 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

116 pages-ADV

Attachment 1

Stage 2B EQUIS EDD

# LDC #49841 (Arcadis-Millersville, MD / Fort Devens)

| LDC | SDG# | DATE REC'D | (2) DATE DUE | 3 D.Metal (6010C/ 6020A) | | Alk. (2320B) | | DOC (9060A) | | Cl,$SO_4$ (9056A) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix: Water/Soil | | | | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
| A | 680-191150-1 | 12/02/20 | 12/16/20 | 4 | 0 | 4 | 0 | 4 | 0 | 4 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | 680-191218-1 | 12/02/20 | 12/16/20 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | 680-191554-1 | 12/02/20 | 12/16/20 | 15 | 0 | 14 | 0 | 14 | 0 | 14 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | T/PG | | | 34 | 0 | 33 | 0 | 33 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 133 |

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

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## Data Validation Report for 6801911501

| | |
|---|---|
| Facility: | Former Fort Devens, Long Term Monitoring |
| Event: | Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| SDG: | 6801911501 |
| Guidance Document: | Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 |
| Prime Contractor: | Seres-Arcadis JV |
| Project Manager: | Jennifer Singer |
| Contract Laboratory(ies): | Eurofins Environment Testing TestAmerica, Arvada, CO |
| Data Review Contractor: | Laboratory Data Consultants, Inc. |
| Data Review Level: | 2B |
| Primary Data Reviewer: | Kevin Kha, Environmental Scientist |
| Second Reviewer: | Pei Geng, Senior Scientist |
| Date Submitted: | December 15, 2020 |

| Field Sample ID | Lab Sample ID | Matrix | Type/Type Code | A2320B | SW6010C - Dissolved | SW6020A - Dissolved | SW9056A | SW9060A - Dissolved |
|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-2A-FAL20 | 680-191150-4 | Water | Field Sample/N | X | X | X | X | X |
| EPA-PZ-2012-2B-FAL20 | 680-191150-5 | Water | Field Sample/N | X | X | X | X | X |
| PZ-12-07-FAL20 | 680-191150-6 | Water | Field Sample/N | X | X | X | X | X |
| PZ-12-08-FAL20 | 680-191150-7 | Water | Field Sample/N | X | X | X | X | X |

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO and were reported under sample delivery group (SDG) 6801911501. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 5 results (17.86%) out of the 28 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency. Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

| Analytical Method | Data Reviewer Comment |
|---|---|
| SW6020A | No additional comments; see Checklist for detail. |
| SW9060A | No additional comments; see Checklist for detail. |
| SW9056A | No additional comments; see Checklist for detail. |
| SW6010C | No additional comments; see Checklist for detail. |
| A2320B | No additional comments; see Checklist for detail. |

December 15, 2020

Reviewed by Kevin Kha, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of a minimum of 10% of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 16, 2021

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

**Quality Control Outliers for test method SW6010C, Dissolved, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB680643527226 (CB)/ CCB680643527226 | Iron | 19.80 | < 17 | < 50 | ug/l | U/None | B2 | |
| CCB680643527250 (CB)/ CCB680643527250 | Iron | 17.30 | < 17 | < 50 | ug/l | U/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Calibration Blank for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-2A-FAL20 | N | Iron | 50.0 | 27.0 J | 50.0 U | | ug/l | B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6010C, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-2B-FAL20 (MS)/ 680-191150-5 | Manganese | 60.00 | 90 - 114 | 10 - 125 | percent | J/UJ | M | Spike amount Insignificant |
| EPA-PZ-2012-2B-FAL20 (SD)/ 680-191150-5 | Manganese | 65.00 | 90 - 114 | 10 - 125 | percent | J/UJ | M | Spike amount Insignificant |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW6020A, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-2B-FAL20 (SD)/ 680-191150-5 | Arsenic | 122.0 | 84 - 116 | 10 - 125 | percent | J/None | M | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW9060A, Dissolved, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB (CB) | Dissolved Organic Carbon | 0.4890 | < 0 | < 0 | mg/l | None/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Calibration Blank for SW9060A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-2A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.740 J | 1.00 U | | mg/l | B2 |
| EPA-PZ-2012-2B-FAL20 | N | Dissolved Organic Carbon | 1.40 | 1.40 | 1.40 U | | mg/l | B2 |
| PZ-12-07-FAL20 | N | Dissolved Organic Carbon | 1.40 | 1.40 | 1.40 U | | mg/l | B2 |
| PZ-12-08-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 B | 1.70 U | | mg/l | L/B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW9060A, Dissolved, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB (CB)/ 680-191150-7 | Dissolved Organic Carbon | 0.5600 | < 0 | < 0 | mg/l | None/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Calibration Blank for SW9060A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-2A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.740 J | 1.00 U | | mg/l | B2 |
| EPA-PZ-2012-2B-FAL20 | N | Dissolved Organic Carbon | 1.40 | 1.40 | 1.40 U | | mg/l | B2 |
| PZ-12-07-FAL20 | N | Dissolved Organic Carbon | 1.40 | 1.40 | 1.40 U | | mg/l | B2 |
| PZ-12-08-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 B | 1.70 U | | mg/l | L/B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW9060A, Dissolved, Lab Blank**

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| MB28051734870 (LB)/ MB28051734870 | Dissolved Organic Carbon | 0.6210 | < 0.35 | < 1 | mg/l | U/None | L | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Lab Blank for SW9060A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| PZ-12-08-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 B | 1.70 U | | mg/l | L/B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Table of All Qualified Results**

| **Test Method: SW6010C** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| EPA-PZ-2012-2A-FAL20 | N | Iron | 50.0 | 27.0 J | 50.0 U | | ug/l | B2 |

| **Test Method: SW9060A** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| EPA-PZ-2012-2A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.740 J | 1.00 U | | mg/l | B2 |
| EPA-PZ-2012-2B-FAL20 | N | Dissolved Organic Carbon | 1.40 | 1.40 | 1.40 U | | mg/l | B2 |
| PZ-12-07-FAL20 | N | Dissolved Organic Carbon | 1.40 | 1.40 | 1.40 U | | mg/l | B2 |
| PZ-12-08-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 B | 1.70 U | | mg/l | L/B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Table of Results with Modified Qualifiers**

**Modified Qualifiers for test method SW9060A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | ADR Result | Modified Result | Reason |
|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-2A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.740 J | 0.740 J | 1.00 U | B2 |
| EPA-PZ-2012-2B-FAL20 | N | Dissolved Organic Carbon | 1.40 | 1.40 | 1.40 | 1.40 U | B2 |
| PZ-12-07-FAL20 | N | Dissolved Organic Carbon | 1.40 | 1.40 | 1.40 | 1.40 U | B2 |
| PZ-12-08-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 B | 1.70 U | 1.70 U | L/B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Reason Code Definitions**

| Code | Definition |
|---|---|
| B2 | CCB |
| L | Lab Blank |
| M | MS Recovery |
| TR | Trace Level Detect |

**Flag Code and Definitions**

| Flag | Definition |
|---|---|
| U | Undetected: The analyte was analyzed for, but not detected. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| R | The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making. |
| B | Blank contamination: The analyte was found in an associated blank above one half the RL, as well as in the sample. |
| UB | The analyte was also detected in an associated laboratory or field blank at a concentration comparable to the concentration in the sample. The reported result has been requalified as not detected. |
| X | The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended. |

## Data Validation Report for 6801911501

**Review Questions**

| Method: A2320B (Alkalinity by Titrimetric Method) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | • | | | |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | | | • | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801911501

### Review Questions

| Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to calibration blank contamination, 1 iron result was qualified as not detected (U). |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Although manganese was not within acceptance limits, no data were qualified since sample concentrations were significantly greater (>4X) than the spike amount. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

## Data Validation Report for 6801911501

### Review Questions

| Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Although arsenic %R was above acceptance limits, the associated sample result was not detected, therefore no data were qualified. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801911501

### Review Questions

| Method: SW9056A (Anion Chromatography) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | • | | | |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed, |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | | | • | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801911501

### Review Questions

| Method: SW9060A (Total Organic Carbon) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to method blank and calibration blank contamination, 4 DOC results were qualified as not detected (U). |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed, |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | | | • | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

**LABORATORY DATA CONSULTANTS, INC.**
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 19, 2021

SUBJECT: Fort Devens, Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 2, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #49841:**

| **SDG #** | **Fraction** |
|---|---|
| 680-191150-1, 680-191218-1<br>680-191554-1 | Dissolved Metals, Wet Chemistry |

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Former Fort Devens Army Installation – BRAC Legacy Sites, Devens, MA; October 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

116 pages-ADV

Attachment 1

Stage 2B EQUIS EDD

# LDC #49841 (Arcadis-Millersville, MD / Fort Devens)

| LDC | SDG# | DATE REC'D | (2) DATE DUE | 3 D.Metal (6010C/ 6020A) | | Alk. (2320B) | | DOC (9060A) | | Cl,$SO_4$ (9056A) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix: Water/Soil | | | | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
| A | 680-191150-1 | 12/02/20 | 12/16/20 | 4 | 0 | 4 | 0 | 4 | 0 | 4 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | 680-191218-1 | 12/02/20 | 12/16/20 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | 680-191554-1 | 12/02/20 | 12/16/20 | 15 | 0 | 14 | 0 | 14 | 0 | 14 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | T/PG | | | 34 | 0 | 33 | 0 | 33 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 133 |

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

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## Data Validation Report for 6801912181

| | |
|---|---|
| Facility: | Former Fort Devens, Long Term Monitoring |
| Event: | Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| SDG: | 6801912181 |
| Guidance Document: | Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 |
| Prime Contractor: | Seres-Arcadis JV |
| Project Manager: | Jennifer Singer |
| Contract Laboratory(ies): | Eurofins Environment Testing TestAmerica, Arvada, CO |
| Data Review Contractor: | Laboratory Data Consultants, Inc. |
| Data Review Level: | 2B |
| Primary Data Reviewer: | Kevin Kha, Environmental Scientist |
| Second Reviewer: | Pei Geng, Senior Scientist |
| Date Submitted: | December 15, 2020 |

| Field Sample ID | Lab Sample ID | Matrix | Type/Type Code | A2320B | SW6010C - Dissolved | SW6020A - Dissolved | SW9056A | SW9060A - Dissolved |
|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-7A-FAL20 | 680-191218-14 | Water | Field Sample/N | X | X | X | X | X |
| EPA-PZ-2012-7B-FAL20 | 680-191218-15 | Water | Field Sample/N | X | X | X | X | X |
| SHM-05-41A-FAL20 | 680-191218-11 | Water | Field Sample/N | X | X | X | X | X |
| SHM-05-41B-FAL20 | 680-191218-12 | Water | Field Sample/N | X | X | X | X | X |
| SHM-05-41C-FAL20 | 680-191218-13 | Water | Field Sample/N | X | X | X | X | X |
| SHM-13-02-FAL20 | 680-191218-1 | Water | Field Sample/N | X | X | X | X | X |
| SHM-13-04-FAL20 | 680-191218-2 | Water | Field Sample/N | X | X | X | X | X |
| SHM-13-05-FAL20 | 680-191218-3 | Water | Field Sample/N | X | X | X | X | X |
| SHM-13-07-FAL20 | 680-191218-4 | Water | Field Sample/N | X | X | X | X | X |
| SHP-2016-1A-FAL20 | 680-191218-5 | Water | Field Sample/N | X | X | X | X | X |
| SHP-2016-1B-FAL20 | 680-191218-6 | Water | Field Sample/N | X | X | X | X | X |
| SHP-2016-2A-FAL20 | 680-191218-7 | Water | Field Sample/N | X | X | X | X | X |
| SHP-2016-2B-FAL20 | 680-191218-8 | Water | Field Sample/N | X | X | X | X | X |
| SHP-2016-4A-FAL20 | 680-191218-9 | Water | Field Sample/N | X | X | X | X | X |
| SHP-2016-4B-FAL20 | 680-191218-10 | Water | Field Sample/N | X | X | X | X | X |

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO and were reported under sample delivery group (SDG) 6801912181. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- Lab Replicate RPD
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 18 results (17.14%) out of the 105 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency. Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

| Analytical Method | Data Reviewer Comment |
|---|---|
| SW6020A | No additional comments; see Checklist for detail. |
| A2320B | No additional comments; see Checklist for detail. |
| SW6010C | No additional comments; see Checklist for detail. |
| SW9056A | No additional comments; see Checklist for detail. |
| SW9060A | No additional comments; see Checklist for detail. |

December 15, 2020

Reviewed by Kevin Kha, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of a minimum of 10% of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 16, 2021

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

**Quality Control Outliers for test method SW6010C, Dissolved, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB680643527106 (CB)/ CCB680643527106 | Iron | 25.20 | < 17 | < 50 | ug/l | U/None | B2 | |
| CCB680643527118 (CB)/ CCB680643527118 | Iron | 18.50 | < 17 | < 50 | ug/l | U/None | B2 | |
| CCB68064352794 (CB)/ CCB68064352794 | Iron | 26.40 | < 17 | < 50 | ug/l | U/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Calibration Blank for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-13-02-FAL20 | N | Iron | 50.0 | 34.0 J | 50.0 U | | ug/l | B2 |
| SHP-2016-2A-FAL20 | N | Iron | 120 | 120 | 120 U | | ug/l | B2 |
| SHP-2016-4B-FAL20 | N | Iron | 50.0 | 33.0 J | 50.0 U | | ug/l | B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6010C, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHM-05-41C-FAL20 (MS)/ 680-191218-13 | Manganese | 70.00 | 90 - 114 | 10 - 125 | percent | J/UJ | M | Spike amount Insignificant |
| SHM-05-41C-FAL20 (SD)/ 680-191218-13 | Manganese | 70.00 | 90 - 114 | 10 - 125 | percent | J/UJ | M | Spike amount Insignificant |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW6020A, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHM-05-41C-FAL20 (MS)/ 680-191218-13 | Arsenic | 145.0 | 84 - 116 | 10 - 125 | percent | J/None | M | Spike amount Insignificant |
| SHM-13-04-FAL20 (SD)/ 680-191218-2 | Arsenic | 196.0 | 84 - 116 | 10 - 125 | percent | J/None | M | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the MS Recovery for SW6020A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-13-04-FAL20 | N | Arsenic | 3.00 | 260 J | 260 J | + | ug/l | M/D |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6020A, Dissolved, MS RPD**

The objective of matrix spikes/matrix spike duplicates (MS/MSD) RPD analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. MS/MSD analyses are also performed to generate data that determines the long-term precision of the analytical method on various matrices. Non-homogenous samples can impact the apparent method precision. Summary forms were evaluated and compared to electronic data deliverables. Matrix spikes/matrix spike duplicates results that were outside of the acceptance criteria are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHM-13-04-FAL20 (SD)/ 680-191218-2 | Arsenic | 24.35 | < 20 | < 20 | rpd | J/UJ | D | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the MS RPD for SW6020A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-13-04-FAL20 | N | Arsenic | 3.00 | 260 J | 260 J | + | ug/l | M/D |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW9060A, Dissolved, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB (CB) | Dissolved Organic Carbon | 0.4890 | < 0 | < 0 | mg/l | None/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Calibration Blank for SW9060A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-7A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.970 J | 1.00 U | | mg/l | B2 |
| EPA-PZ-2012-7B-FAL20 | N | Dissolved Organic Carbon | 1.10 | 1.10 | 1.10 U | | mg/l | B2 |
| SHM-05-41A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.860 J | 1.00 U | | mg/l | B2 |
| SHM-05-41B-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 U | | mg/l | B2 |
| SHM-13-02-FAL20 | N | Dissolved Organic Carbon | 1.50 | 1.50 | 1.50 U | | mg/l | B2 |
| SHM-13-04-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.930 J | 1.00 U | | mg/l | B2 |
| SHM-13-05-FAL20 | N | Dissolved Organic Carbon | 2.00 | 2.00 | 2.00 U | | mg/l | B2 |
| SHM-13-07-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.970 J | 1.00 U | | mg/l | B2 |
| SHP-2016-1A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.600 J | 1.00 U | | mg/l | B2 |
| SHP-2016-1B-FAL20 | N | Dissolved Organic Carbon | 1.80 | 1.80 | 1.80 U | | mg/l | B2 |
| SHP-2016-2A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.690 J | 1.00 U | | mg/l | B2 |
| SHP-2016-2B-FAL20 | N | Dissolved Organic Carbon | 1.80 | 1.80 | 1.80 U | | mg/l | B2 |
| SHP-2016-4A-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 U | | mg/l | B2 |
| SHP-2016-4B-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.840 J | 1.00 U | | mg/l | B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Table of All Qualified Results**

| **Test Method: SW6010C** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| SHM-13-02-FAL20 | N | Iron | 50.0 | 34.0 J | 50.0 U | | ug/l | B2 |
| SHP-2016-2A-FAL20 | N | Iron | 120 | 120 | 120 U | | ug/l | B2 |
| SHP-2016-4B-FAL20 | N | Iron | 50.0 | 33.0 J | 50.0 U | | ug/l | B2 |

| **Test Method: SW6020A** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| SHM-13-04-FAL20 | N | Arsenic | 3.00 | 260 J | 260 J | + | ug/l | M/D |

| **Test Method: SW9060A** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| EPA-PZ-2012-7A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.970 J | 1.00 U | | mg/l | B2 |
| EPA-PZ-2012-7B-FAL20 | N | Dissolved Organic Carbon | 1.10 | 1.10 | 1.10 U | | mg/l | B2 |
| SHM-05-41A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.860 J | 1.00 U | | mg/l | B2 |
| SHM-05-41B-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 U | | mg/l | B2 |
| SHM-13-02-FAL20 | N | Dissolved Organic Carbon | 1.50 | 1.50 | 1.50 U | | mg/l | B2 |
| SHM-13-04-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.930 J | 1.00 U | | mg/l | B2 |
| SHM-13-05-FAL20 | N | Dissolved Organic Carbon | 2.00 | 2.00 | 2.00 U | | mg/l | B2 |
| SHM-13-07-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.970 J | 1.00 U | | mg/l | B2 |
| SHP-2016-1A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.600 J | 1.00 U | | mg/l | B2 |
| SHP-2016-1B-FAL20 | N | Dissolved Organic Carbon | 1.80 | 1.80 | 1.80 U | | mg/l | B2 |
| SHP-2016-2A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.690 J | 1.00 U | | mg/l | B2 |
| SHP-2016-2B-FAL20 | N | Dissolved Organic Carbon | 1.80 | 1.80 | 1.80 U | | mg/l | B2 |
| SHP-2016-4A-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 U | | mg/l | B2 |
| SHP-2016-4B-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.840 J | 1.00 U | | mg/l | B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Table of Results with Modified Qualifiers**

**Modified Qualifiers for test method SW9056A**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | ADR Result | Modified Result | Reason |
|---|---|---|---|---|---|---|---|
| SHM-05-41B-FAL20 | N | Sulfate | 5.00 | 2.50 J | 2.50 J | 2.50 J | TR |
| SHM-13-02-FAL20 | N | Sulfate | 1.00 | 4.40 | 4.40 J | 4.40 | |
| SHM-13-04-FAL20 | N | Sulfate | 1.00 | 10.0 | 10.0 J | 10.0 | |
| SHM-13-05-FAL20 | N | Sulfate | 1.00 | 7.90 | 7.90 J | 7.90 | |
| SHM-13-07-FAL20 | N | Sulfate | 1.00 | 8.40 | 8.40 J | 8.40 | |
| SHP-2016-1A-FAL20 | N | Sulfate | 1.00 | 4.50 | 4.50 J | 4.50 | |

**Modified Qualifiers for test method SW9060A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | ADR Result | Modified Result | Reason |
|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-7A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.970 J | 0.970 J | 1.00 U | B2 |
| EPA-PZ-2012-7B-FAL20 | N | Dissolved Organic Carbon | 1.10 | 1.10 | 1.10 | 1.10 U | B2 |
| SHM-05-41A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.860 J | 0.860 J | 1.00 U | B2 |
| SHM-05-41B-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 | 1.70 U | B2 |
| SHM-13-02-FAL20 | N | Dissolved Organic Carbon | 1.50 | 1.50 | 1.50 | 1.50 U | B2 |
| SHM-13-04-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.930 J | 0.930 J | 1.00 U | B2 |
| SHM-13-05-FAL20 | N | Dissolved Organic Carbon | 2.00 | 2.00 | 2.00 | 2.00 U | B2 |
| SHM-13-07-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.970 J | 0.970 J | 1.00 U | B2 |
| SHP-2016-1A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.600 J | 0.600 J | 1.00 U | B2 |
| SHP-2016-1B-FAL20 | N | Dissolved Organic Carbon | 1.80 | 1.80 | 1.80 | 1.80 U | B2 |
| SHP-2016-2A-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.690 J | 0.690 J | 1.00 U | B2 |
| SHP-2016-2B-FAL20 | N | Dissolved Organic Carbon | 1.80 | 1.80 | 1.80 | 1.80 U | B2 |
| SHP-2016-4A-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 | 1.70 U | B2 |
| SHP-2016-4B-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.840 J | 0.840 J | 1.00 U | B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Reason Code Definitions**

| Code | Definition |
|---|---|
| B2 | CCB |
| D | MS RPD |
| M | MS Recovery |
| TR | Trace Level Detect |

**Flag Code and Definitions**

| Flag | Definition |
|---|---|
| U | Undetected: The analyte was analyzed for, but not detected. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| R | The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making. |
| B | Blank contamination: The analyte was found in an associated blank above one half the RL, as well as in the sample. |
| UB | The analyte was also detected in an associated laboratory or field blank at a concentration comparable to the concentration in the sample. The reported result has been requalified as not detected. |
| X | The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended. |

**Review Questions**

| Method: A2320B (Alkalinity by Titrimetric Method) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | • | | | |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | A DUP was prepared and analyzed in batch 516966. The DUP RPD was within project acceptance limits. |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

**Review Questions**

| Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to calibration blank contamination, 3 iron results were qualified as non-detected (U). |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Although manganese was not within acceptance limits, no data were qualified since sample concentrations were significantly greater (>4X) than the spike amount. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

**Review Questions**

| Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Although arsenic %R in samples SHM-13-04-FAL20MS/MSD were not within acceptance limits, no data were qualified since sample concentrations were significantly greater (>4X) than the spike amount.<br>Due to arsenic %R above acceptance limits in samples SHM-05-41C-FAL20MS/MSD, 1 arsenic result was qualified as detected estimated (J) with a high bias (+). |
| Was the MS/MSD RPD within project acceptance limits? | | • | | Due to arsenic RPD outside of acceptance limits in sample SHM-05-41C-FAL20MSD, 1 arsenic result was qualified as detected estimated (J). |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

## Data Validation Report for 6801912181

### Review Questions

| Method: SW9056A (Anion Chromatography) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | • | | | |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

**Review Questions**

| Method: SW9060A (Total Organic Carbon) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to calibration blank contamination, 14 DOC results were qualified as non-detected (U). |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

**LABORATORY DATA CONSULTANTS, INC.**
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 19, 2021

SUBJECT: Fort Devens, Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 2, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #49841:**

| **SDG #** | **Fraction** |
|---|---|
| 680-191150-1, 680-191218-1<br>680-191554-1 | Dissolved Metals, Wet Chemistry |

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Former Fort Devens Army Installation – BRAC Legacy Sites, Devens, MA; October 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

116 pages-ADV

Attachment 1

Stage 2B EQUIS EDD

# LDC #49841 (Arcadis-Millersville, MD / Fort Devens)

| LDC | SDG# | DATE REC'D | (2) DATE DUE | 3 D.Metal (6010C/ 6020A) | | Alk. (2320B) | | DOC (9060A) | | Cl,$SO_4$ (9056A) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix: Water/Soil | | | | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
| A | 680-191150-1 | 12/02/20 | 12/16/20 | 4 | 0 | 4 | 0 | 4 | 0 | 4 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | 680-191218-1 | 12/02/20 | 12/16/20 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | 680-191554-1 | 12/02/20 | 12/16/20 | 15 | 0 | 14 | 0 | 14 | 0 | 14 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | T/PG | | | 34 | 0 | 33 | 0 | 33 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 133 |

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

L:\Arcadis\Fort Devens\49841ST.wpd

## Data Validation Report for 6801915541

| | |
|---|---|
| Facility: | Former Fort Devens, Long Term Monitoring |
| Event: | Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| SDG: | 6801915541 |
| Guidance Document: | Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 |
| Prime Contractor: | Seres-Arcadis JV |
| Project Manager: | Jennifer Singer |
| Contract Laboratory(ies): | Eurofins Environment Testing TestAmerica, Arvada, CO |
| Data Review Contractor: | Laboratory Data Consultants, Inc. |
| Data Review Level: | 2B |
| Primary Data Reviewer: | Kevin Kha, Environmental Scientist |
| Second Reviewer: | Pei Geng, Senior Scientist |
| Date Submitted: | December 15, 2020 |

| Field Sample ID | Lab Sample ID | Matrix | Type/Type Code | A2320B | SW6010C - Dissolved | SW6020A - Dissolved | SW9056A | SW9060A - Dissolved |
|---|---|---|---|---|---|---|---|---|
| SHL-23-FAL20 | 680-191554-5 | Water | Field Sample/N | X | X | X | X | X |
| SHL-4-FAL20 | 680-191554-6 | Water | Field Sample/N | X | X | X | X | X |
| SHL-DUP06-FAL20 | 680-191554-1 | Water | Field Duplicate/FD | X | X | X | X | X |
| SHL-RB3-FAL20 | 680-191554-15 | Water | Equipment Blank/EB | | X | X | | |
| SHL-RB4-FAL20 | 680-191554-3 | Water | Equipment Blank/EB | | X | X | | |
| SHM-10-04-FAL20 | 680-191554-7 | Water | Field Sample/N | X | X | X | X | X |
| SHM-10-05A-FAL20 | 680-191554-8 | Water | Field Sample/N | X | X | X | X | X |
| SHM-10-06A-FAL20 | 680-191554-2 | Water | Field Sample/N | X | X | X | X | X |
| SHM-10-11-FAL20 | 680-191554-9 | Water | Field Sample/N | X | X | X | X | X |
| SHM-10-16-FAL20 | 680-191554-10 | Water | Field Sample/N | X | X | X | X | X |
| SHM-93-18B-FAL20 | 680-191554-11 | Water | Field Sample/N | X | X | X | X | X |
| SHP-2016-06A-FAL20 | 680-191554-12 | Water | Field Sample/N | X | X | X | X | X |
| SHP-2016-06B-FAL20 | 680-191554-13 | Water | Field Sample/N | X | X | X | X | X |
| SHP-2016-06C-FAL20 | 680-191554-14 | Water | Field Sample/N | X | X | X | X | X |
| SHP-2016-07B-FAL20 | 680-191554-4 | Water | Field Sample/N | X | X | X | X | X |

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO and were reported under sample delivery group (SDG) 6801915541. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Equipment Blank
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 6 results (6.19%) out of the 97 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency. Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

| Analytical Method | Data Reviewer Comment |
|---|---|
| SW9056A | No additional comments; see Checklist for detail. |
| SW9060A | No additional comments; see Checklist for detail. |
| SW6010C | Due to serial dilution %D outside of acceptance limits, the manganese result in sample SHM-10-04-FAL20 was qualified as detected estimated (J). |
| A2320B | No additional comments; see Checklist for detail. |
| SW6020A | No additional comments; see Checklist for detail. |

December 15, 2020

Reviewed by Kevin Kha, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of a minimum of 10% of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 16, 2021

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

**Quality Control Outliers for test method SW6010C, Dissolved, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB680644415194 (CB)/ CCB680644415194 | Iron | 20.00 | < 17 | < 50 | ug/l | U/None | B2 | |
| CCB680644415218 (CB)/ CCB680644415218 | Iron | 22.40 | < 17 | < 50 | ug/l | U/None | B2 | |
| CCB68064441572 (CB)/ CCB68064441572 | Iron | 17.60 | < 17 | < 50 | ug/l | U/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Calibration Blank for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHL-RB4-FAL20 | EB | Iron | 60.0 | 60.0 | 60.0 U | | ug/l | B2 |
| SHM-10-05A-FAL20 | N | Iron | 96.0 | 96.0 | 96.0 U | | ug/l | B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6010C, Dissolved, Equipment Blank**

The purpose of equipment blanks is to determine the existence and magnitude of cross-contamination problems resulting from the process during sampling. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in equipment blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHL-RB4-FAL20 (EB)/ 680-191554-3 | Iron | 60.00 | < 17 | < 50 | ug/l | U/None | V | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW6010C, Dissolved, Lab Blank**

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| MB6806442051A (LB)/ MB6806442051A | Manganese | 2.490 | < 1 | < 10 | ug/l | U/None | L | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Lab Blank for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHL-23-FAL20 | N | Manganese | 11.0 | 11.0 | 11.0 U | | ug/l | L |
| SHM-10-05A-FAL20 | N | Manganese | 10.0 | 3.50 J | 10.0 U | | ug/l | L |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6010C, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHM-10-04-FAL20 (MS)/ 680-191554-7 | Manganese | 87.75 | 90 - 114 | 10 - 125 | percent | J/UJ | M | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the MS Recovery for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-10-04-FAL20 | N | Manganese | 10.0 | 280 J | 280 J | | ug/l | M/A |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW9060A, Dissolved, Lab Blank**

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| MB28051815736 (LB)/ MB28051815736 | Dissolved Organic Carbon | 0.5890 | < 0.35 | < 1 | mg/l | U/None | L | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Lab Blank for SW9060A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHP-2016-06C-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.840 J B | 1.00 U | | mg/l | L |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Table of All Qualified Results**

| **Test Method: SW6010C** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| SHL-23-FAL20 | N | Manganese | 11.0 | 11.0 | 11.0 U | | ug/l | L |
| SHL-RB4-FAL20 | EB | Iron | 60.0 | 60.0 | 60.0 U | | ug/l | B2 |
| SHM-10-04-FAL20 | N | Manganese | 10.0 | 280 J | 280 J | | ug/l | M/A |
| SHM-10-05A-FAL20 | N | Iron | 96.0 | 96.0 | 96.0 U | | ug/l | B2 |
| SHM-10-05A-FAL20 | N | Manganese | 10.0 | 3.50 J | 10.0 U | | ug/l | L |

| **Test Method: SW9060A** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| SHP-2016-06C-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.840 J B | 1.00 U | | mg/l | L |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Table of Results with Modified Qualifiers**

**Modified Qualifiers for test method SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | ADR Result | Modified Result | Reason |
|---|---|---|---|---|---|---|---|
| SHL-23-FAL20 | N | Manganese | 11.0 | 11.0 | 11.0 J | 11.0 U | L |
| SHM-10-04-FAL20 | N | Manganese | 10.0 | 280 J | 280 J | 280 J | M/A |

**Modified Qualifiers for test method SW9056A**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | ADR Result | Modified Result | Reason |
|---|---|---|---|---|---|---|---|
| SHM-10-04-FAL20 | N | Sulfate | 1.00 | 17.0 | 17.0 J | 17.0 | |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Reason Code Definitions**

| Code | Definition |
|---|---|
| A | Serial dilution |
| B2 | CCB |
| L | Lab Blank |
| M | MS Recovery |
| TR | Trace Level Detect |
| V | Equipment Blank |

**Flag Code and Definitions**

| Flag | Definition |
|---|---|
| U | Undetected: The analyte was analyzed for, but not detected. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| R | The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making. |
| B | Blank contamination: The analyte was found in an associated blank above one half the RL, as well as in the sample. |
| UB | The analyte was also detected in an associated laboratory or field blank at a concentration comparable to the concentration in the sample. The reported result has been requalified as not detected. |
| X | The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended. |

**Review Questions**

| Method: A2320B (Alkalinity by Titrimetric Method) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | | | • | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

**Review Questions**

| Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to method blank and calibration blank contamination, 2 iron and 2 manganese results were qualified as non-detected (U). |
| Were field blanks (EBs or FBs) submitted with these samples? | • | | | |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Due to manganese %R below the acceptance limits, 1 manganese result was qualified as detected estimated (J) with a low bias (-). |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

## Data Validation Report for 6801915541

### Review Questions

| Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | • | | | |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801915541

### Review Questions

| Method: SW9056A (Anion Chromatography) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | • | | | |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801915541

### Review Questions

| Method: SW9060A (Total Organic Carbon) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | | • | | Due to calibration blank contamination, 1 DOC result was qualified as non-detected (U). |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

## Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020
Field Duplicates for SDG: 6801915541

| Location | Analysis |
|---|---|
| SHP-2016-07B | A2320B |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHP-2016-07B-FAL20 / SHL-DUP06-FAL20 | 680-191554-4 / 680-191554-1 | Alkalinity, Total (as CaCO3) | 110 | 130 | 10.0 | 16.7 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHP-2016-07B | SW6010C |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHP-2016-07B-FAL20 / SHL-DUP06-FAL20 | 680-191554-4 / 680-191554-1 | Iron (FLDFLT) | 460 | 500 | 50.0 | 8.33 | 30 | OK | NA |
| SHP-2016-07B-FAL20 / SHL-DUP06-FAL20 | 680-191554-4 / 680-191554-1 | Manganese (FLDFLT) | 580 | 610 | 10.0 | 5.04 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHP-2016-07B | SW6020A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHP-2016-07B-FAL20 / SHL-DUP06-FAL20 | 680-191554-4 / 680-191554-1 | Arsenic (FLDFLT) | 65.0 | 71.0 | 3.00 | 8.82 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHP-2016-07B | SW9056A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHP-2016-07B-FAL20 / SHL-DUP06-FAL20 | 680-191554-4 / 680-191554-1 | Chloride | 2.60 | 2.70 | 0.500 | 3.77 | 30 | OK | NA |
| SHP-2016-07B-FAL20 / SHL-DUP06-FAL20 | 680-191554-4 / 680-191554-1 | Sulfate | 30.0 | 33.0 | 1.00 | 9.52 | 30 | OK | NA |

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

**Field Duplicate Report By SDG**
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020
Field Duplicates for SDG: 6801915541

| Location | Analysis |
|---|---|
| SHP-2016-07B | SW9060A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHP-2016-07B-FAL20 / SHL-DUP06-FAL20 | 680-191554-4 / 680-191554-1 | Dissolved Organic Carbon (FLDFLT) | 1.60 | 1.80 | 1.00 | 11.8 | 30 | NA | OK |

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

**LABORATORY DATA CONSULTANTS, INC.**
**2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099**

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 19, 2021

SUBJECT: Fort Devens, Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 7, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #49902:**

| **SDG #** | **Fraction** |
|---|---|
| 680-191150-2, 680-191377-1<br>680-191519-1 | Volatiles, Dissolved Metals, Alkalinity, Wet Chemistry, Methane, Ethane & Ethene |

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Former Fort Devens Army Installation – BRAC Legacy Sites, Devens, MA; October 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

127 pages-ADV

Attachment 1

Stage 2B EQUIS EDD

# LDC #49902 (Arcadis-Millersville, MD / Fort Devens)

| LDC | SDG# | DATE REC'D | (2) DATE DUE | VOA (8260B) | | 3 D.Metal (6010C/ 6020A) | | Methane Ethane Ethene | | Alk. (2320B) | | DOC (9060A) | | Cl,$SO_4$ (9056A) | | $NO_3$/ $NO_2$-N (353.2) | | $SO_4$ (9056A) | | S= (9034) | | TOC (9060A) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix: Water/Soil | | | | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
| A | 680-191150-2 | 12/07/20 | 12/21/20 | 4 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | - | - | - | - | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | | | | | | | | | | | | | | | | |
| B | 680-191377-1 | 12/07/20 | 12/21/20 | - | - | 8 | 0 | - | - | 8 | 0 | 13 | 0 | 8 | 0 | - | - | - | - | - | - | - | - | | | | | | | | | | | | | | | | |
| C | 680-191519-1 | 12/07/20 | 12/21/20 | - | - | 13 | 0 | - | - | 12 | 0 | 12 | 0 | 12 | 0 | - | - | - | - | - | - | - | - | | | | | | | | | | | | | | | | |
| Total | T/PG | | | 4 | 0 | 24 | 0 | 1 | 0 | 21 | 0 | 25 | 0 | 20 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 99 |

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

L:\Arcadis\Fort Devens\49902ST.wpd

## Data Validation Report for 6801913771

| | |
|---|---|
| Facility: | Former Fort Devens, Long Term Monitoring |
| Event: | Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| SDG: | 6801913771 |
| Guidance Document: | Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 |
| Prime Contractor: | Seres-Arcadis JV |
| Project Manager: | Jennifer Singer |
| Contract Laboratory(ies): | Eurofins Environment Testing TestAmerica, Arvada, CO |
| Data Review Contractor: | Laboratory Data Consultants, Inc. |
| Data Review Level: | 2B |
| Primary Data Reviewer: | Kevin Kha, Environmental Scientist |
| Second Reviewer: | Pei Geng, Senior Scientist |
| Date Submitted: | December 21, 2020 |

| Field Sample ID | Lab Sample ID | Matrix | Type/Type Code | A2320B | SW6010C - Dissolved | SW6020A - Dissolved | SW9056A | SW9060A - Dissolved |
|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-5A-FAL20 | 680-191377-1 | Water | Field Sample/N | | | | | X |
| EPA-PZ-2012-5B-FAL20 | 680-191377-2 | Water | Field Sample/N | | | | | X |
| SHL-8D-FAL20 | 680-191377-3 | Water | Field Sample/N | X | X | X | X | X |
| SHL-8S-FAL20 | 680-191377-4 | Water | Field Sample/N | X | X | X | X | X |
| SHL-DUP08-FAL20 | 680-191377-5 | Water | Field Duplicate/FD | | | | | X |
| SHM-10-02-FAL20 | 680-191377-6 | Water | Field Sample/N | X | X | X | X | X |
| SHM-10-03-FAL20 | 680-191377-7 | Water | Field Sample/N | X | X | X | X | X |
| SHM-10-07-FAL20 | 680-191377-8 | Water | Field Sample/N | X | X | X | X | X |
| SHM-10-08-FAL20 | 680-191377-9 | Water | Field Sample/N | X | X | X | X | X |
| SHM-10-14-FAL20 | 680-191377-10 | Water | Field Sample/N | X | X | X | X | X |
| SHM-13-08-FAL20 | 680-191377-11 | Water | Field Sample/N | X | X | X | X | X |
| SHM-96-5B-FAL20 | 680-191377-12 | Water | Field Sample/N | | | | | X |
| SHM-96-5C-FAL20 | 680-191377-13 | Water | Field Sample/N | | | | | X |

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO and were reported under sample delivery group (SDG) 6801913771. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 6 results (9.84%) out of the 61 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency. Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

| Analytical Method | Data Reviewer Comment |
|---|---|
| SW9056A | No additional comments; see Checklist for detail. |
| SW6020A | No additional comments; see Checklist for detail. |
| SW6010C | No additional comments; see Checklist for detail. |
| A2320B | No additional comments; see Checklist for detail. |
| SW9060A | No additional comments; see Checklist for detail. |

December 21, 2020

Reviewed by Kevin Kha, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of a minimum of 10% of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 16, 2021

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

**Quality Control Outliers for test method A2320B, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB28051729929 (CB)/ CCB28051729929 | Alkalinity, Total (as CaCO3) | 3.700 | < 3.1 | < 10 | mg/l | U/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW6010C, Dissolved, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB68064441524 (CB)/ CCB68064441524 | Iron | 20.90 | < 17 | < 50 | ug/l | U/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Calibration Blank for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHL-8D-FAL20 | N | Iron | 100 | 100 | 100 U | | ug/l | B2 |
| SHL-8S-FAL20 | N | Iron | 70.0 | 70.0 | 70.0 U | | ug/l | B2 |
| SHM-10-02-FAL20 | N | Iron | 62.0 | 62.0 | 62.0 U | | ug/l | B2 |
| SHM-10-03-FAL20 | N | Iron | 75.0 | 75.0 | 75.0 U | | ug/l | B2 |
| SHM-10-08-FAL20 | N | Iron | 53.0 | 53.0 | 53.0 U | | ug/l | B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6010C, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHM-10-07-FAL20 (SD)/ 680-191377-8 | Iron | 56.00 | 87 - 115 | 10 - 125 | percent | J/UJ | M | Spike amount Insignificant |
| SHM-10-07-FAL20 (MS)/ 680-191377-8 | Iron | 72.00 | 87 - 115 | 10 - 125 | percent | J/UJ | M | Spike amount Insignificant |
| SHM-10-07-FAL20 (SD)/ 680-191377-8 | Manganese | 80.00 | 90 - 114 | 10 - 125 | percent | J/UJ | M | Spike amount Insignificant |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW6020A, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHM-10-07-FAL20 (MS)/ 680-191377-8 | Arsenic | 120.0 | 84 - 116 | 10 - 125 | percent | J/None | M | Spike amount Insignificant |
| SHM-10-07-FAL20 (SD)/ 680-191377-8 | Arsenic | 80.00 | 84 - 116 | 10 - 125 | percent | J/UJ | M | Spike amount Insignificant |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW9060A, Dissolved, Lab Blank**

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| MB28051815736 (LB)/ MB28051815736 | Dissolved Organic Carbon | 0.5890 | < 0.35 | < 1 | mg/l | U/None | L | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Lab Blank for SW9060A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHL-8S-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.610 J B | 1.00 U | | mg/l | L/B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Table of All Qualified Results**

| **Test Method: SW6010C** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| SHL-8D-FAL20 | N | Iron | 100 | 100 | 100 U | | ug/l | B2 |
| SHL-8S-FAL20 | N | Iron | 70.0 | 70.0 | 70.0 U | | ug/l | B2 |
| SHM-10-02-FAL20 | N | Iron | 62.0 | 62.0 | 62.0 U | | ug/l | B2 |
| SHM-10-03-FAL20 | N | Iron | 75.0 | 75.0 | 75.0 U | | ug/l | B2 |
| SHM-10-08-FAL20 | N | Iron | 53.0 | 53.0 | 53.0 U | | ug/l | B2 |

| **Test Method: SW9060A** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| SHL-8S-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.610 J B | 1.00 U | | mg/l | L/B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Table of Results with Modified Qualifiers**

**Modified Qualifiers for test method SW9060A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | ADR Result | Modified Result | Reason |
|---|---|---|---|---|---|---|---|
| SHL-8S-FAL20 | N | Dissolved Organic Carbon | 1.00 | 0.610 J B | 1.00 U | 1.00 U | L/B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Reason Code Definitions**

| Code | Definition |
|---|---|
| B2 | CCB |
| L | Lab Blank |
| M | MS Recovery |
| TR | Trace Level Detect |

**Flag Code and Definitions**

| Flag | Definition |
|---|---|
| U | Undetected: The analyte was analyzed for, but not detected. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| R | The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making. |
| B | Blank contamination: The analyte was found in an associated blank above one half the RL, as well as in the sample. |
| UB | The analyte was also detected in an associated laboratory or field blank at a concentration comparable to the concentration in the sample. The reported result has been requalified as not detected. |
| X | The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended. |

**Review Questions**

| Method: A2320B (Alkalinity by Titrimetric Method) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Although alkalinity was detected in a calibration blank, no client samples bracketed the affected blank, therefore no data were qualified. |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | | | • | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801913771

### Review Questions

| Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to method blank and calibration blank contamination, 5 iron results were qualified as non-detected (U). |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Although iron and manganese were not within project acceptance limits, no data were qualified since the sample concentrations were significantly greater (>4X) than the spike amount. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

**Review Questions**

| Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Although arsenic %R was not within project limits, no data were qualified since sample concentrations were significantly greater (>4X) than the spike amount. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

**Review Questions**

| Method: SW9056A (Anion Chromatography) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | • | | | |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | | | • | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801913771

### Review Questions

| Method: SW9060A (Total Organic Carbon) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to method blank and calibration blank contamination, 1 DOC result was qualified as non-detected (U). |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | | | • | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

**Field Duplicate Report By SDG**
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020
Field Duplicates for SDG: 6801913771

| Location | Analysis |
|---|---|
| SHM-96-5C | SW9060A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-96-5C-FAL20 / SHL-DUP08-FAL20 | 680-191377-13 / 680-191377-5 | Dissolved Organic Carbon (FLDFLT) | 2.40 | 1.70 | 1.00 | 34.1 | 30 | NA | OK |

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

**LABORATORY DATA CONSULTANTS, INC.**
**2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099**

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 19, 2021

SUBJECT: Fort Devens, Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 7, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #49902:**

| **SDG #** | **Fraction** |
|---|---|
| 680-191150-2, 680-191377-1<br>680-191519-1 | Volatiles, Dissolved Metals, Alkalinity, Wet Chemistry, Methane, Ethane & Ethene |

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Former Fort Devens Army Installation – BRAC Legacy Sites, Devens, MA; October 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

127 pages-ADV

Attachment 1

Stage 2B EQUIS EDD

# LDC #49902 (Arcadis-Millersville, MD / Fort Devens)

| LDC | SDG# | DATE REC'D | (2) DATE DUE | VOA (8260B) | | 3 D.Metal (6010C/ 6020A) | | Methane Ethane Ethene | | Alk. (2320B) | | DOC (9060A) | | Cl,$SO_4$ (9056A) | | $NO_3$/ $NO_2$-N (353.2) | | $SO_4$ (9056A) | | S= (9034) | | TOC (9060A) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix: Water/Soil | | | | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
| A | 680-191150-2 | 12/07/20 | 12/21/20 | 4 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | - | - | - | - | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | | | | | | | | | | | | | | | | |
| B | 680-191377-1 | 12/07/20 | 12/21/20 | - | - | 8 | 0 | - | - | 8 | 0 | 13 | 0 | 8 | 0 | - | - | - | - | - | - | - | - | | | | | | | | | | | | | | | | |
| C | 680-191519-1 | 12/07/20 | 12/21/20 | - | - | 13 | 0 | - | - | 12 | 0 | 12 | 0 | 12 | 0 | - | - | - | - | - | - | - | - | | | | | | | | | | | | | | | | |
| Total | T/PG | | | 4 | 0 | 24 | 0 | 1 | 0 | 21 | 0 | 25 | 0 | 20 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 99 |

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

L:\Arcadis\Fort Devens\49902ST.wpd

# Data Validation Report for 6801915191

| | |
|---|---|
| Facility: | Former Fort Devens, Long Term Monitoring |
| Event: | Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| SDG: | 6801915191 |
| Guidance Document: | Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 |
| Prime Contractor: | Seres-Arcadis JV |
| Project Manager: | Jennifer Singer |
| Contract Laboratory(ies): | Eurofins Environment Testing TestAmerica, Arvada, CO |
| Data Review Contractor: | Laboratory Data Consultants, Inc. |
| Data Review Level: | 2B |
| Primary Data Reviewer: | Kevin Kha, Environmental Scientist |
| Second Reviewer: | Pei Geng, Senior Scientist |
| Date Submitted: | December 21, 2020 |

| Field Sample ID | Lab Sample ID | Matrix | Type/Type Code | A2320B | SW6010C - Dissolved | SW6020A - Dissolved | SW9056A | SW9060A - Dissolved |
|---|---|---|---|---|---|---|---|---|
| EPA-PZ-2012-6A-FAL20 | 680-191519-1 | Water | Field Sample/N | X | X | X | X | X |
| EPA-PZ-2012-6B-FAL20 | 680-191519-2 | Water | Field Sample/N | X | X | X | X | X |
| SHL-DUP04-FAL20 | 680-191519-3 | Water | Field Duplicate/FD | X | X | X | X | X |
| SHL-DUP10-FAL20 | 680-191519-4 | Water | Field Duplicate/FD | X | X | X | X | X |
| SHL-RB2-FAL20 | 680-191519-9 | Water | Equipment Blank/EB | | X | X | | |
| SHM-05-40X-FAL20 | 680-191519-5 | Water | Field Sample/N | X | X | X | X | X |
| SHM-07-03-FAL20 | 680-191519-6 | Water | Field Sample/N | X | X | X | X | X |
| SHM-07-05X-FAL20 | 680-191519-7 | Water | Field Sample/N | X | X | X | X | X |
| SHM-10-12-FAL20 | 680-191519-8 | Water | Field Sample/N | X | X | X | X | X |
| SHM-93-10D-FAL20 | 680-191519-10 | Water | Field Sample/N | X | X | X | X | X |
| SHP-01-36X-FAL20 | 680-191519-11 | Water | Field Sample/N | X | X | X | X | X |
| SHP-01-37X-FAL20 | 680-191519-12 | Water | Field Sample/N | X | X | X | X | X |
| SHP-01-38A-FAL20 | 680-191519-13 | Water | Field Sample/N | X | X | X | X | X |

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO and were reported under sample delivery group (SDG) 6801915191. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Equipment Blank
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- Lab Replicate RPD
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 2 results (2.30%) out of the 87 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency. Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

| Analytical Method | Data Reviewer Comment |
|---|---|
| A2320B | No additional comments; see Checklist for detail. |
| SW6020A | No additional comments; see Checklist for detail. |
| SW6010C | No additional comments; see Checklist for detail. |
| SW9060A | No additional comments; see Checklist for detail. |
| SW9056A | No additional comments; see Checklist for detail. |

December 21, 2020

Reviewed by Kevin Kha, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of a minimum of 10% of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 16, 2021

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

**Quality Control Outliers for test method A2320B, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB28051729929 (CB)/ CCB28051729929 | Alkalinity, Total (as CaCO3) | 3.700 | < 3.1 | < 10 | mg/l | U/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method A2320B, Lab Blank**

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| MB2805174765 (LB)/ MB2805174765 | Alkalinity, Total (as CaCO3) | 3.600 | < 3.1 | < 10 | mg/l | U/None | L | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Lab Blank for A2320B**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-07-03-FAL20 | N | Alkalinity, Total (as CaCO3) | 15.0 | 15.0 | 15.0 U | | mg/l | L |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6010C, Dissolved, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB68064441572 (CB)/ CCB68064441572 | Iron | 17.60 | < 17 | < 50 | ug/l | U/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Calibration Blank for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHL-RB2-FAL20 | EB | Iron | 50.0 | 18.0 J | 50.0 U | | ug/l | B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6010C, Dissolved, Equipment Blank**

The purpose of equipment blanks is to determine the existence and magnitude of cross-contamination problems resulting from the process during sampling. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in equipment blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHL-RB2-FAL20 (EB)/ 680-191519-9 | Manganese | 1.100 | < 1 | < 10 | ug/l | U/None | V | |
| SHL-RB2-FAL20 (EB)/ 680-191519-9 | Iron | 18.00 | < 17 | < 50 | ug/l | U/None | V | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW6010C, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHM-10-12-FAL20 (SD)/ 680-191519-8 | Iron | 42.00 | 87 - 115 | 10 - 125 | percent | J/UJ | M | Spike amount Insignificant |
| SHM-10-12-FAL20 (SD)/ 680-191519-8 | Manganese | 65.00 | 90 - 114 | 10 - 125 | percent | J/UJ | M | Spike amount Insignificant |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW6020A, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHM-10-12-FAL20 (MS)/ 680-191519-8 | Arsenic | -150.0 | 84 - 116 | 10 - 125 | percent | J/X | M | Spike amount Insignificant |
| SHM-10-12-FAL20 (SD)/ 680-191519-8 | Arsenic | 170.0 | 84 - 116 | 10 - 125 | percent | J/None | M | Spike amount Insignificant |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Table of All Qualified Results**

**Test Method: A2320B Extraction Method: NONE**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-07-03-FAL20 | N | Alkalinity, Total (as CaCO3) | 15.0 | 15.0 | 15.0 U | | mg/l | L |

**Test Method: SW6010C Extraction Method: Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHL-RB2-FAL20 | EB | Iron | 50.0 | 18.0 J | 50.0 U | | ug/l | B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Table of Results with Modified Qualifiers**

**Modified Qualifiers for test method A2320B**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | ADR Result | Modified Result | Reason |
|---|---|---|---|---|---|---|---|
| SHM-07-03-FAL20 | N | Alkalinity, Total (as CaCO3) | 15.0 | 15.0 | 15.0 J | 15.0 U | L |

**Modified Qualifiers for test method SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | ADR Result | Modified Result | Reason |
|---|---|---|---|---|---|---|---|
| SHM-07-03-FAL20 | N | Manganese | 10.0 | 8.90 J | 10.0 U | 8.90 J | TR |
| SHM-93-10D-FAL20 | N | Manganese | 10.0 | 9.90 J | 10.0 U | 9.90 J | TR |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Reason Code Definitions**

| Code | Definition |
|---|---|
| B2 | CCB |
| L | Lab Blank |
| M | MS Recovery |
| TR | Trace Level Detect |
| V | Equipment Blank |

**Flag Code and Definitions**

| Flag | Definition |
|---|---|
| U | Undetected: The analyte was analyzed for, but not detected. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| R | The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making. |
| B | Blank contamination: The analyte was found in an associated blank above one half the RL, as well as in the sample. |
| UB | The analyte was also detected in an associated laboratory or field blank at a concentration comparable to the concentration in the sample. The reported result has been requalified as not detected. |
| X | The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended. |

**Review Questions**

| Method: A2320B (Alkalinity by Titrimetric Method) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to method blank contamination, 1 alkalinity result was qualified as non-detected (U). Although alkalinity was detected in the calibration blanks, the associated sample results were significantly greater than the concentration found in the calibration blank, therefore no data were qualified. |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | A DUP was submitted with these samples. The DUP RPD was within project limits. |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

**Review Questions**

| Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to calibration blank contamination, 1 iron result was qualified as non-detected (U). |
| Were target analytes reported in the field blank(s) less than MDL? | | • | | Iron and manganese were detected in the equipment blank SHL-RB2-FAL20. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Although iron and manganese were not within acceptance limits, no data were qualified since sample concentrations were significantly greater (>4X) than the spike amount. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

**Review Questions**

| Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | • | | | |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Although arsenic was not within acceptance limits, no data were qualified since sample concentrations were significantly greater (>4X) than the spike amount. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Data Validation Report for 6801915191

### Review Questions

| Method: SW9056A (Anion Chromatography) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | | • | | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | • | | | |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

**Review Questions**

| Method: SW9060A (Total Organic Carbon) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were target analytes reported in the field blank(s) less than MDL? | | | • | A field blank was not submitted with these samples. |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | | | • | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | • | | | |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

## Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020
Field Duplicates for SDG: 6801915191

| Location | Analysis |
|---|---|
| SHM-05-40X | A2320B |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-05-40X-FAL20 / SHL-DUP10-FAL20 | 680-191519-5 / 680-191519-4 | Alkalinity, Total (as CaCO3) | 150 | 140 | 10.0 | 6.90 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHM-05-40X | SW6010C |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-05-40X-FAL20 / SHL-DUP10-FAL20 | 680-191519-5 / 680-191519-4 | Iron (FLDFLT) | 24000 | 24000 | 50.0 | 0.00 | 30 | OK | NA |
| SHM-05-40X-FAL20 / SHL-DUP10-FAL20 | 680-191519-5 / 680-191519-4 | Manganese (FLDFLT) | 670 | 680 | 10.0 | 1.48 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHM-05-40X | SW6020A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-05-40X-FAL20 / SHL-DUP10-FAL20 | 680-191519-5 / 680-191519-4 | Arsenic (FLDFLT) | 2100 | 2300 | 3.00 | 9.09 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHM-05-40X | SW9056A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-05-40X-FAL20 / SHL-DUP10-FAL20 | 680-191519-5 / 680-191519-4 | Chloride | 11.0 | 11.0 | 0.500 | 0.00 | 30 | OK | NA |
| SHM-05-40X-FAL20 / SHL-DUP10-FAL20 | 680-191519-5 / 680-191519-4 | Sulfate | 3.80 | 3.80 | 1.00 | 0.00 | 30 | NA | OK |

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

**Field Duplicate Report By SDG**
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020
Field Duplicates for SDG: 6801915191

| Location | Analysis |
|---|---|
| SHM-05-40X | SW9060A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHM-05-40X-FAL20 / SHL-DUP10-FAL20 | 680-191519-5 / 680-191519-4 | Dissolved Organic Carbon (FLDFLT) | 1.60 | 1.60 | 1.00 | 0.00 | 30 | NA | OK |

| Location | Analysis |
|---|---|
| SHP-01-38A | A2320B |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHP-01-38A-FAL20 / SHL-DUP04-FAL20 | 680-191519-13 / 680-191519-3 | Alkalinity, Total (as CaCO3) | 90.0 | 91.0 | 10.0 | 1.10 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHP-01-38A | SW6010C |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHP-01-38A-FAL20 / SHL-DUP04-FAL20 | 680-191519-13 / 680-191519-3 | Iron (FLDFLT) | 24000 | 25000 | 50.0 | 4.08 | 30 | OK | NA |
| SHP-01-38A-FAL20 / SHL-DUP04-FAL20 | 680-191519-13 / 680-191519-3 | Manganese (FLDFLT) | 2200 | 2300 | 10.0 | 4.44 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHP-01-38A | SW6020A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHP-01-38A-FAL20 / SHL-DUP04-FAL20 | 680-191519-13 / 680-191519-3 | Arsenic (FLDFLT) | 150 | 140 | 3.00 | 6.90 | 30 | OK | NA |

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

**Field Duplicate Report By SDG**
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020
Field Duplicates for SDG: 6801915191

| Location | Analysis |
|---|---|
| SHP-01-38A | SW9056A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHP-01-38A-FAL20 / SHL-DUP04-FAL20 | 680-191519-13 / 680-191519-3 | Chloride | 14.0 | 14.0 | 0.500 | 0.00 | 30 | OK | NA |
| SHP-01-38A-FAL20 / SHL-DUP04-FAL20 | 680-191519-13 / 680-191519-3 | Sulfate | 8.00 | 8.10 | 1.00 | 1.24 | 30 | OK | NA |

| Location | Analysis |
|---|---|
| SHP-01-38A | SW9060A |

| Field ID - Primary/Field Dup | Lab ID - Primary/Field Dup | Analyte | Primary Result | FD Result | RL | RPD | RPD Criteria | RPD Check | RL Check |
|---|---|---|---|---|---|---|---|---|---|
| SHP-01-38A-FAL20 / SHL-DUP04-FAL20 | 680-191519-13 / 680-191519-3 | Dissolved Organic Carbon (FLDFLT) | 1.40 | 1.40 | 1.00 | 0.00 | 30 | NA | OK |

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

**LABORATORY DATA CONSULTANTS, INC.**
**2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099**

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 19, 2021

SUBJECT: Fort Devens, Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 15, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project #50005:**

| **SDG #** | **Fraction** |
|---|---|
| 680-190497-1, 680-191327-1 | Dissolved Metals, Wet Chemistry |

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Former Fort Devens Army Installation – BRAC Legacy Sites, Devens, MA; October 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

60 pages-ADV

Attachment 1

**Stage 2B EQUIS EDD**

# LDC #50005 (Arcadis-Millersville, MD / Fort Devens)

| LDC | SDG# | DATE REC'D | (2) DATE DUE | 3 D.Metal (6010C/ 6020A) | | Alk. (2320B) | | DOC (9060A) | | Cl,$SO_4$ (9056A) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix: Water/Soil | | | | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
| A | 680-190497-1 | 12/15/20 | 12/30/20 | 11 | 0 | - | - | - | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | 680-191327-1 | 12/15/20 | 12/30/20 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | T/PG | | | 22 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55 |

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

L:\Arcadis\Fort Devens\50005ST.wpd

# Data Validation Report for 6801913271

| | |
|---|---|
| Facility: | Former Fort Devens, Long Term Monitoring |
| Event: | Seres-Arcadis JV, Long Term Monitoring, SHL, Fall 2020 |
| SDG: | 6801913271 |
| Guidance Document: | Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 |
| Prime Contractor: | Seres-Arcadis JV |
| Project Manager: | Jennifer Singer |
| Contract Laboratory(ies): | Eurofins Environment Testing TestAmerica, Arvada, CO |
| Data Review Contractor: | Laboratory Data Consultants, Inc. |
| Data Review Level: | 2B |
| Primary Data Reviewer: | Kevin Kha, Environmental Scientist |
| Second Reviewer: | Pei Geng, Senior Scientist |
| Date Submitted: | December 30, 2020 |

| Field Sample ID | Lab Sample ID | Matrix | Type/Type Code | A2320B | SW6010C - Dissolved | SW6020A - Dissolved | SW9056A | SW9060A - Dissolved |
|---|---|---|---|---|---|---|---|---|
| SHL-10-FAL20 | 680-191327-1 | Water | Field Sample/N | X | X | X | X | X |
| SHL-3-FAL20 | 680-191327-3 | Water | Field Sample/N | X | X | X | X | X |
| SHL-5-FAL20 | 680-191327-4 | Water | Field Sample/N | X | X | X | X | X |
| SHL-RB1-FAL20 | 680-191327-2 | Water | Equipment Blank/EB | X | X | X | X | X |
| SHM-05-42A-FAL20 | 680-191327-5 | Water | Field Sample/N | X | X | X | X | X |
| SHM-05-42B-FAL20 | 680-191327-6 | Water | Field Sample/N | X | X | X | X | X |
| SHM-10-10-FAL20 | 680-191327-7 | Water | Field Sample/N | X | X | X | X | X |
| SHM-13-01-FAL20 | 680-191327-8 | Water | Field Sample/N | X | X | X | X | X |
| SHM-13-06-FAL20 | 680-191327-9 | Water | Field Sample/N | X | X | X | X | X |
| SHP-2016-5A-FAL20 | 680-191327-10 | Water | Field Sample/N | X | X | X | X | X |
| SHP-2016-5B-FAL20 | 680-191327-11 | Water | Field Sample/N | X | X | X | X | X |

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO and were reported under sample delivery group (SDG) 6801913271. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Equipment Blank
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 15 results (19.48%) out of the 77 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency. Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

| Analytical Method | Data Reviewer Comment |
|---|---|
| SW6020A | No additional comments; see Checklist for detail. |
| A2320B | No additional comments; see Checklist for detail. |
| SW6010C | No additional comments; see Checklist for detail. |
| SW9056A | No additional comments; see Checklist for detail. |
| SW9060A | No additional comments; see Checklist for detail. |

December 30, 2020

Reviewed by Kevin Kha, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of a minimum of 10% of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 16, 2021

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

**Quality Control Outliers for test method SW6010C, Dissolved, Calibration Blank**

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| CCB680643859346 (CB)/ CCB680643859346 | Iron | 27.40 | < 17 | < 50 | ug/l | U/None | B2 | |
| CCB680643859358 (CB)/ CCB680643859358 | Iron | 21.10 | < 17 | < 50 | ug/l | U/None | B2 | |
| CCB680644236150 (CB)/ CCB680644236150 | Iron | 17.10 | < 17 | < 50 | ug/l | U/None | B2 | |
| CCB680644236162 (CB)/ CCB680644236162 | Iron | 23.00 | < 17 | < 50 | ug/l | U/None | B2 | |
| CCB680644236174 (CB)/ CCB680644236174 | Iron | 24.20 | < 17 | < 50 | ug/l | U/None | B2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Calibration Blank for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-05-42A-FAL20 | N | Iron | 50.0 | 49.0 J | 50.0 U | | ug/l | B2 |
| SHM-13-01-FAL20 | N | Iron | 50.0 | 31.0 J | 50.0 U | | ug/l | B2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6010C, Dissolved, Lab Blank**

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| MB6806436641A (LB)/ MB6806436641A | Manganese | 5.660 | < 1 | < 10 | ug/l | U/None | L | |
| MB6806437181A (LB)/ MB6806437181A | Manganese | 3.770 | < 1 | < 10 | ug/l | U/None | L | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Lab Blank for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHL-10-FAL20 | N | Manganese | 23.0 | 23.0 B | 23.0 U | | ug/l | L |
| SHL-3-FAL20 | N | Manganese | 10.0 | 9.10 J | 10.0 U | | ug/l | L |
| SHM-13-01-FAL20 | N | Manganese | 10.0 | 4.30 J | 10.0 UJ | | ug/l | L/D/M |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6010C, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHM-13-01-FAL20 (SD)/ 680-191327-8 | Manganese | 1818 | 90 - 114 | 10 - 125 | percent | J/None | M | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the MS Recovery for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-13-01-FAL20 | N | Manganese | 10.0 | 4.30 J | 10.0 UJ | | ug/l | L/D/M |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6010C, Dissolved, MS RPD**

The objective of matrix spikes/matrix spike duplicates (MS/MSD) RPD analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. MS/MSD analyses are also performed to generate data that determines the long-term precision of the analytical method on various matrices. Non-homogenous samples can impact the apparent method precision. Summary forms were evaluated and compared to electronic data deliverables. Matrix spikes/matrix spike duplicates results that were outside of the acceptance criteria are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHM-13-01-FAL20 (SD)/ 680-191327-8 | Manganese | 179.0 | < 20 | < 20 | rpd | J/UJ | D | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the MS RPD for SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-13-01-FAL20 | N | Manganese | 10.0 | 4.30 J | 10.0 UJ | | ug/l | L/D/M |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6020A, Dissolved, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHM-13-01-FAL20 (SD)/ 680-191327-8 | Arsenic | 146.0 | 84 - 116 | 10 - 125 | percent | J/None | M | |
| SHM-13-01-FAL20 (MS)/ 680-191327-8 | Arsenic | 57.70 | 84 - 116 | 10 - 125 | percent | J/UJ | M | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the MS Recovery for SW6020A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-13-01-FAL20 | N | Arsenic | 3.00 | 3.00 U J | 3.00 UJ | | ug/l | M/D |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW6020A, Dissolved, MS RPD**

The objective of matrix spikes/matrix spike duplicates (MS/MSD) RPD analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. MS/MSD analyses are also performed to generate data that determines the long-term precision of the analytical method on various matrices. Non-homogenous samples can impact the apparent method precision. Summary forms were evaluated and compared to electronic data deliverables. Matrix spikes/matrix spike duplicates results that were outside of the acceptance criteria are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHM-13-01-FAL20 (SD)/ 680-191327-8 | Arsenic | 86.70 | < 20 | < 20 | rpd | J/UJ | D | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the MS RPD for SW6020A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHM-13-01-FAL20 | N | Arsenic | 3.00 | 3.00 U J | 3.00 UJ | | ug/l | M/D |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW9060A, Dissolved, Equipment Blank**

The purpose of equipment blanks is to determine the existence and magnitude of cross-contamination problems resulting from the process during sampling. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in equipment blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| SHL-RB1-FAL20 (EB)/ 680-191327-2 | Dissolved Organic Carbon | 0.5900 | < 0.35 | < 1 | mg/l | U/None | V | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Equipment Blank for SW9060A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHL-10-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 U | | mg/l | L/V |
| SHL-3-FAL20 | N | Dissolved Organic Carbon | 1.60 | 1.60 | 1.60 U | | mg/l | L/V |
| SHM-05-42A-FAL20 | N | Dissolved Organic Carbon | 1.10 | 1.10 | 1.10 U | | mg/l | L/V |
| SHM-05-42B-FAL20 | N | Dissolved Organic Carbon | 1.80 | 1.80 | 1.80 U | | mg/l | L/V |
| SHM-10-10-FAL20 | N | Dissolved Organic Carbon | 2.80 | 2.80 | 2.80 U | | mg/l | V |
| SHM-13-01-FAL20 | N | Dissolved Organic Carbon | 1.20 | 1.20 | 1.20 U | | mg/l | L/V |
| SHM-13-06-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 U | | mg/l | L/V |
| SHP-2016-5B-FAL20 | N | Dissolved Organic Carbon | 2.70 | 2.70 | 2.70 U | | mg/l | V |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW9060A, Dissolved, Lab Blank**

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| MB28051764135 (LB)/ MB28051764135 | Dissolved Organic Carbon | 0.4080 | < 0.35 | < 1 | mg/l | U/None | L | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Lab Blank for SW9060A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| SHL-10-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 U | | mg/l | L/V |
| SHL-3-FAL20 | N | Dissolved Organic Carbon | 1.60 | 1.60 | 1.60 U | | mg/l | L/V |
| SHL-RB1-FAL20 | EB | Dissolved Organic Carbon | 1.00 | 0.590 J | 1.00 U | | mg/l | L |
| SHM-05-42A-FAL20 | N | Dissolved Organic Carbon | 1.10 | 1.10 | 1.10 U | | mg/l | L/V |
| SHM-05-42B-FAL20 | N | Dissolved Organic Carbon | 1.80 | 1.80 | 1.80 U | | mg/l | L/V |
| SHM-13-01-FAL20 | N | Dissolved Organic Carbon | 1.20 | 1.20 | 1.20 U | | mg/l | L/V |
| SHM-13-06-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 U | | mg/l | L/V |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

**Table of All Qualified Results**

| **Test Method: SW6010C** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| SHL-10-FAL20 | N | Manganese | 23.0 | 23.0 B | 23.0 U | | ug/l | L |
| SHL-3-FAL20 | N | Manganese | 10.0 | 9.10 J | 10.0 U | | ug/l | L |
| SHM-05-42A-FAL20 | N | Iron | 50.0 | 49.0 J | 50.0 U | | ug/l | B2 |
| SHM-13-01-FAL20 | N | Manganese | 10.0 | 4.30 J | 10.0 UJ | | ug/l | L/D/M |
| SHM-13-01-FAL20 | N | Iron | 50.0 | 31.0 J | 50.0 U | | ug/l | B2 |

| **Test Method: SW6020A** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| SHM-13-01-FAL20 | N | Arsenic | 3.00 | 3.00 U J | 3.00 UJ | | ug/l | M/D |

| **Test Method: SW9060A** | **Extraction Method: Dissolved** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| SHL-10-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 U | | mg/l | L/V |
| SHL-3-FAL20 | N | Dissolved Organic Carbon | 1.60 | 1.60 | 1.60 U | | mg/l | L/V |
| SHL-RB1-FAL20 | EB | Dissolved Organic Carbon | 1.00 | 0.590 J | 1.00 U | | mg/l | L |
| SHM-05-42A-FAL20 | N | Dissolved Organic Carbon | 1.10 | 1.10 | 1.10 U | | mg/l | L/V |
| SHM-05-42B-FAL20 | N | Dissolved Organic Carbon | 1.80 | 1.80 | 1.80 U | | mg/l | L/V |
| SHM-10-10-FAL20 | N | Dissolved Organic Carbon | 2.80 | 2.80 | 2.80 U | | mg/l | V |
| SHM-13-01-FAL20 | N | Dissolved Organic Carbon | 1.20 | 1.20 | 1.20 U | | mg/l | L/V |
| SHM-13-06-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 U | | mg/l | L/V |
| SHP-2016-5B-FAL20 | N | Dissolved Organic Carbon | 2.70 | 2.70 | 2.70 U | | mg/l | V |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Table of Results with Modified Qualifiers**

**Modified Qualifiers for test method SW6010C, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | ADR Result | Modified Result | Reason |
|---|---|---|---|---|---|---|---|
| SHL-10-FAL20 | N | Manganese | 23.0 | 23.0 B | 23.0 J | 23.0 U | L |
| SHM-13-01-FAL20 | N | Manganese | 10.0 | 4.30 J | 10.0 UJ | 10.0 UJ | L/D/M |

**Modified Qualifiers for test method SW9060A, Dissolved**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | ADR Result | Modified Result | Reason |
|---|---|---|---|---|---|---|---|
| SHL-10-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 U | 1.70 U | L/V |
| SHL-3-FAL20 | N | Dissolved Organic Carbon | 1.60 | 1.60 | 1.60 U | 1.60 U | L/V |
| SHM-05-42A-FAL20 | N | Dissolved Organic Carbon | 1.10 | 1.10 | 1.10 U | 1.10 U | L/V |
| SHM-05-42B-FAL20 | N | Dissolved Organic Carbon | 1.80 | 1.80 | 1.80 U | 1.80 U | L/V |
| SHM-10-10-FAL20 | N | Dissolved Organic Carbon | 2.80 | 2.80 | 2.80 | 2.80 U | V |
| SHM-13-01-FAL20 | N | Dissolved Organic Carbon | 1.20 | 1.20 | 1.20 U | 1.20 U | L/V |
| SHM-13-06-FAL20 | N | Dissolved Organic Carbon | 1.70 | 1.70 | 1.70 U | 1.70 U | L/V |
| SHP-2016-5B-FAL20 | N | Dissolved Organic Carbon | 2.70 | 2.70 | 2.70 | 2.70 U | V |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Reason Code Definitions**

| Code | Definition |
|---|---|
| B2 | CCB |
| D | MS RPD |
| L | Lab Blank |
| M | MS Recovery |
| TR | Trace Level Detect |
| V | Equipment Blank |

**Flag Code and Definitions**

| Flag | Definition |
|---|---|
| U | Undetected: The analyte was analyzed for, but not detected. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria. |
| J | Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. |
| R | The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making. |
| B | Blank contamination: The analyte was found in an associated blank above one half the RL, as well as in the sample. |
| UB | The analyte was also detected in an associated laboratory or field blank at a concentration comparable to the concentration in the sample. The reported result has been requalified as not detected. |
| X | The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended. |

**Review Questions**

| Method: A2320B (Alkalinity by Titrimetric Method) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were target analytes reported in the field blank(s) less than MDL? | • | | | |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | | • | | MS/MSD not performed. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | | | • | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

**Review Questions**

| Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to method blank contamination, 3 manganese results were qualified as non-detected (U).<br>Due to calibration blank contamination, 2 iron results were qualified as non-detected (U). |
| Were field blanks (EBs or FBs) submitted with these samples? | • | | | |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Due to MS %R above criteria, 1 manganese result was qualified as detected estimated (J). |
| Was the MS/MSD RPD within project acceptance limits? | | • | | Due to MS/MSD RPD, 1 manganese result was qualified as detected estimated (J). |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

## Data Validation Report for 6801913271

### Review Questions

| Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | • | | | |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | Due to MS/MSD %R above and below criteria, 1 arsenic result was qualified as non-detected estimated (UJ). |
| Was the MS/MSD RPD within project acceptance limits? | | • | | Due to MSD RPD above criteria, 1 arsenic result was qualified as non-detected estimated (UJ). |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

**Review Questions**

| Method: SW9056A (Anion Chromatography) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | • | | | |
| Were field blanks (EBs or FBs) submitted with these samples? | • | | | |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | • | | | |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported. |

**Review Questions**

| Method: SW9060A (Total Organic Carbon) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests? | • | | | |
| Were samples preserved properly and received in good condition? | • | | | |
| Were holding times met? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Was the Calibration within acceptance criteria? | • | | | |
| Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis? | • | | | |
| Were all reported analytes for the ICV within the required criteria? | • | | | |
| Were CCVs run at the required frequency and within acceptance criteria? | • | | | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than MDL? | | • | | Due to method blank contamination, 7 DOC results were qualified as non-detected (U). |
| Were target analytes reported in the field blank(s) less than MDL? | | • | | Due to equipment blank contamination, 8 DOC results were qualified as non-detected (U). |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | • | | | |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | Only a LCS was performed. |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits? | | | • | A field duplicate was not submitted with these samples. |
| Were QAPP specified laboratory LOQs/RLs achieved? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were any data rejected during the verification process? | | • | | All data is acceptable as reported or as qualified during data validation. |

# Attachment 7

## 3PE Gradient Calculations

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 1 |
| Date: | |

| Well Location | | | |
|---|---|---|---|
| Well Name | X Coordinate (L) | Y Coordinate (L) | |
| SHP-05-46B | 630,041.84 | 3,027,946.62 | 1 |
| EPA-PZ-2012-4B | 629,989.87 | 3,028,043.80 | 1 |
| SHP-05-45B | 629,995.45 | 3,027,956.77 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

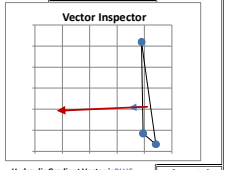
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 30 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | SHP-05-46B | EPA-PZ-2012-4B | SHP-05-45B |
| Maximum = | 213.77 | 212.93 | 213.24 |
| Minimum = | 210.51 | 209.82 | 210.07 |
| Average = | 212.10 | 211.36 | 211.57 |
| Range = | 3.26 | 3.11 | 3.17 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.013989 | 2.331445 |
| Minimum = | 0.008920 | 1.486704 |
| Average = | 0.011403 | 1.900442 |

10/22/19 12:00 AM

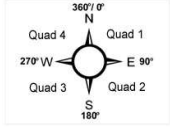



| Hydraulic Gradient Vector is BLUE<br>Groundwater Velocity Vector is RED | | Suggested Scaling Factors |
|---|---|---|
| Hyd. Grad. Scale Factor = | 5,000.00 | 3,939.04 |
| Velocity Scale Factor = | 150.00 | 23.63 |

| Number of Measurements | |
|---|---|
| Date/Time | 9 |
| SHP-05-46B | 9 |
| EPA-PZ-2012-4B | 9 |
| SHP-05-45B | 9 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,009.05 | 3,027,982.40 | 629,943.14 | 3,027,981.62 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,009.05 | 3,027,982.40 | 629,679.47 | 3,027,978.50 |

| Number of Vectors | | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 2 | 2 |
| 270 - 360 | 7 | 7 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 630,009.05 | 3,027,982.40 | |
| Triangle Area | 1,990.34 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 110.20 | (L) | SHP-05-46B 49.52 |
| Distance #2 - #3 | 87.21 | (L) | EPA-PZ-2012-4B 24.47 |
| Distance #1 - #3 | 47.49 | (L) | SHP-05-45B 106.01 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,041.84 | 3,027,946.62 | 629,989.87 | 3,028,043.80 |
| Nodes #2-#3 | 629,989.87 | 3,028,043.80 | 629,995.45 | 3,027,956.77 |
| Nodes #1-#3 | 630,041.84 | 3,027,946.62 | 629,995.45 | 3,027,956.77 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | SHP-05-46B | EPA-PZ-2012-4B | SHP-05-45B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 210.74 | 209.90 | 210.27 | 0.010022 | 291.38 | 1.670286 | 291.38 | 0.00 |
| 10/20/16 0:00 | 210.51 | 209.82 | 210.07 | 0.009271 | 284.34 | 1.545209 | 284.34 | 0.00 |
| 3/2/17 0:00 | 212.93 | 212.32 | 212.40 | 0.011276 | 271.00 | 1.879306 | 271.00 | 0.00 |
| 11/2/17 0:00 | 212.86 | 212.08 | 212.24 | 0.013185 | 274.33 | 2.197461 | 274.33 | 0.00 |
| 5/22/18 0:00 | 212.72 | 211.83 | 212.17 | 0.011605 | 285.96 | 1.934192 | 285.96 | 0.00 |
| 11/1/18 0:00 | 212.86 | 212.21 | 212.22 | 0.013989 | 266.80 | 2.331445 | 266.80 | 0.00 |
| 5/13/19 0:00 | 213.77 | 212.93 | 213.24 | 0.011172 | 284.88 | 1.861973 | 284.88 | 0.00 |
| 10/22/19 0:00 | 211.30 | 210.63 | 210.69 | 0.013184 | 269.32 | 2.197402 | 269.32 | 0.00 |
| 11/4/20 0:00 | 211.22 | 210.49 | 210.80 | 0.008920 | 289.82 | 1.486704 | 289.82 | 0.00 |

| | Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 8/16/16 0:00 | 0.009332196 | -0.003653061 | 5392.341 | -0.009332 | 0.003653 | 4 | -1.555366 | 0.608844 | 4 | 630,009.05 | 3,027,982.40 | 629,962.39 | 3,028,000.66 | 630,009.05 | 3,027,982.40 | 629,775.75 | 3,028,073.72 |
| 10/20/16 0:00 | 0.008982288 | -0.002296661 | 1505.4608 | -0.008982 | 0.002297 | 4 | -1.497048 | 0.382777 | 4 | 630,009.05 | 3,027,982.40 | 629,964.14 | 3,027,993.88 | 630,009.05 | 3,027,982.40 | 629,784.50 | 3,028,039.81 |
| 3/2/17 0:00 | 0.011274129 | -0.000196368 | -6295.656 | -0.011274 | 0.000196 | 4 | -1.879021 | 0.032728 | 4 | 630,009.05 | 3,027,982.40 | 629,952.68 | 3,027,983.38 | 630,009.05 | 3,027,982.40 | 629,727.20 | 3,027,987.31 |
| 11/2/17 0:00 | 0.013147132 | -0.000995501 | -5056.059 | -0.013147 | 0.000996 | 4 | -2.191189 | 0.165917 | 4 | 630,009.05 | 3,027,982.40 | 629,943.32 | 3,027,987.37 | 630,009.05 | 3,027,982.40 | 629,680.37 | 3,028,007.28 |
| 5/22/18 0:00 | 0.011157739 | -0.003191306 | 2845.981 | -0.011158 | 0.003191 | 4 | -1.859623 | 0.531884 | 4 | 630,009.05 | 3,027,982.40 | 629,953.26 | 3,027,998.35 | 630,009.05 | 3,027,982.40 | 629,730.11 | 3,028,062.18 |
| 11/1/18 0:00 | 0.013966874 | 0.000780601 | -10950.47 | -0.013967 | -0.000781 | 3 | -2.327812 | -0.130100 | 3 | 630,009.05 | 3,027,982.40 | 629,939.22 | 3,027,978.49 | 630,009.05 | 3,027,982.40 | 629,659.88 | 3,027,962.88 |
| 5/13/19 0:00 | 0.010796973 | -0.002869728 | 2100.6081 | -0.010797 | 0.002870 | 4 | -1.799496 | 0.478288 | 4 | 630,009.05 | 3,027,982.40 | 629,955.07 | 3,027,996.75 | 630,009.05 | 3,027,982.40 | 629,739.13 | 3,028,054.14 |
| 10/22/19 0:00 | 0.013183488 | 0.000155859 | -8566.782 | -0.013183 | -0.000156 | 3 | -2.197248 | -0.025976 | 3 | 630,009.05 | 3,027,982.40 | 629,943.14 | 3,027,981.62 | 630,009.05 | 3,027,982.40 | 629,679.47 | 3,027,978.50 |
| 11/4/20 0:00 | 0.008392034 | -0.003023924 | 4080.1669 | -0.008392 | 0.003024 | 4 | -1.398672 | 0.503987 | 4 | 630,009.05 | 3,027,982.40 | 629,967.09 | 3,027,997.52 | 630,009.05 | 3,027,982.40 | 629,799.25 | 3,028,057.99 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 2 |
| Date: | |

| Well Location | | | |
|---|---|---|---|
| Well Name | X Coordinate (L) | Y Coordinate (L) | |
| EPA-PZ-2012-3B | 630,064.63 | 3,028,086.13 | 1 |
| EPA-PZ-2012-4B | 629,989.87 | 3,028,043.80 | 1 |
| SHP-05-46B | 630,041.84 | 3,027,946.62 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

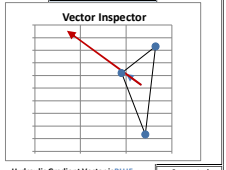
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 30 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-3B | EPA-PZ-2012-4B | SHP-05-46B |
| Maximum = | 213.14 | 212.93 | 213.77 |
| Minimum = | 210.20 | 209.82 | 210.51 |
| Average = | 211.68 | 211.36 | 212.10 |
| Range = | 2.94 | 3.11 | 3.26 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.009304 | 1.550613 |
| Minimum = | 0.006230 | 1.038283 |
| Average = | 0.007850 | 1.308253 |

10/22/19 12:00 AM

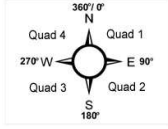



| Hydraulic Gradient Vector is BLUE<br>Groundwater Velocity Vector is RED | | Suggested Scaling Factors |
|---|---|---|
| Hyd. Grad. Scale Factor = | 5,000.00 | 7,596.97 |
| Velocity Scale Factor = | 150.00 | 45.58 |

| Number of Measurements | |
|---|---|
| Date/Time | 9 |
| EPA-PZ-2012-3B | 9 |
| EPA-PZ-2012-4B | 9 |
| SHP-05-46B | 9 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,032.11 | 3,028,025.52 | 629,999.68 | 3,028,042.64 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,032.11 | 3,028,025.52 | 629,869.93 | 3,028,111.15 |

| | Number of Vectors | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 0 | 0 |
| 270 - 360 | 9 | 9 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 630,032.11 | 3,028,025.52 | |
| Triangle Area | 4,732.54 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 85.91 | (L) | EPA-PZ-2012-3B 51.20 |
| Distance #2 - #3 | 110.20 | (L) | EPA-PZ-2012-4B 91.38 |
| Distance #1 - #3 | 141.36 | (L) | SHP-05-46B 37.41 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,064.63 | 3,028,086.13 | 629,989.87 | 3,028,043.80 |
| Nodes #2-#3 | 629,989.87 | 3,028,043.80 | 630,041.84 | 3,027,946.62 |
| Nodes #1-#3 | 630,064.63 | 3,028,086.13 | 630,041.84 | 3,027,946.62 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-3B | EPA-PZ-2012-4B | SHP-05-46B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 210.30 | 209.90 | 210.74 | 0.009030 | 299.44 | 1.504950 | 299.44 | 0.00 |
| 10/20/16 0:00 | 210.20 | 209.82 | 210.51 | 0.007755 | 295.70 | 1.292463 | 295.70 | 0.00 |
| 3/2/17 0:00 | 212.60 | 212.32 | 212.93 | 0.006453 | 300.15 | 1.075582 | 300.15 | 0.00 |
| 11/2/17 0:00 | 212.46 | 212.08 | 212.86 | 0.008439 | 298.87 | 1.406441 | 298.87 | 0.00 |
| 5/22/18 0:00 | 212.21 | 211.83 | 212.72 | 0.009304 | 302.09 | 1.550613 | 302.09 | 0.00 |
| 11/1/18 0:00 | 212.37 | 212.21 | 212.86 | 0.006230 | 313.09 | 1.038283 | 313.09 | 0.00 |
| 5/13/19 0:00 | 213.14 | 212.93 | 213.77 | 0.008044 | 313.23 | 1.340681 | 313.23 | 0.00 |
| 10/22/19 0:00 | 210.97 | 210.63 | 211.30 | 0.007336 | 297.83 | 1.222657 | 297.83 | 0.00 |
| 11/4/20 0:00 | 210.87 | 210.49 | 211.22 | 0.008056 | 297.18 | 1.342610 | 297.18 | 0.00 |

| | Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 8/16/16 0:00 | 0.007863559 | -0.004438459 | 8695.7851 | -0.007864 | 0.004438 | 4 | -1.310593 | 0.739743 | 4 | 630,032.11 | 3,028,025.52 | 629,992.80 | 3,028,047.71 | 630,032.11 | 3,028,025.52 | 629,835.52 | 3,028,136.48 |
| 10/20/16 0:00 | 0.006987381 | -0.003363498 | 5992.6586 | -0.006987 | 0.003363 | 4 | -1.164563 | 0.560583 | 4 | 630,032.11 | 3,028,025.52 | 629,997.18 | 3,028,042.33 | 630,032.11 | 3,028,025.52 | 629,857.43 | 3,028,109.60 |
| 3/2/17 0:00 | 0.005580519 | -0.003241196 | 6511.132 | -0.005581 | 0.003241 | 4 | -0.930086 | 0.540199 | 4 | 630,032.11 | 3,028,025.52 | 630,004.21 | 3,028,041.72 | 630,032.11 | 3,028,025.52 | 629,892.60 | 3,028,106.55 |
| 11/2/17 0:00 | 0.007389881 | -0.004074363 | 7893.8788 | -0.007390 | 0.004074 | 4 | -1.231647 | 0.679060 | 4 | 630,032.11 | 3,028,025.52 | 629,995.16 | 3,028,045.89 | 630,032.11 | 3,028,025.52 | 629,847.37 | 3,028,127.38 |
| 5/22/18 0:00 | 0.007881825 | -0.004943198 | 10214.58 | -0.007882 | 0.004943 | 4 | -1.313638 | 0.823866 | 4 | 630,032.11 | 3,028,025.52 | 629,992.70 | 3,028,050.23 | 630,032.11 | 3,028,025.52 | 629,835.07 | 3,028,149.10 |
| 11/1/18 0:00 | 0.004549701 | -0.004255513 | 10231.825 | -0.004550 | 0.004256 | 4 | -0.758284 | 0.709252 | 4 | 630,032.11 | 3,028,025.52 | 630,009.36 | 3,028,046.79 | 630,032.11 | 3,028,025.52 | 629,918.37 | 3,028,131.90 |
| 5/13/19 0:00 | 0.005861449 | -0.005509147 | 13202.215 | -0.005861 | 0.005509 | 4 | -0.976908 | 0.918191 | 4 | 630,032.11 | 3,028,025.52 | 630,002.81 | 3,028,053.06 | 630,032.11 | 3,028,025.52 | 629,885.58 | 3,028,163.25 |
| 10/22/19 0:00 | 0.006487247 | -0.003425156 | 6495.2518 | -0.006487 | 0.003425 | 4 | -1.081208 | 0.570859 | 4 | 630,032.11 | 3,028,025.52 | 629,999.68 | 3,028,042.64 | 630,032.11 | 3,028,025.52 | 629,869.93 | 3,028,111.15 |
| 11/4/20 0:00 | 0.00716627 | -0.003679438 | 6837.3109 | -0.007166 | 0.003679 | 4 | -1.194378 | 0.613240 | 4 | 630,032.11 | 3,028,025.52 | 629,996.28 | 3,028,043.91 | 630,032.11 | 3,028,025.52 | 629,852.96 | 3,028,117.50 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 3 |
| Date: | |

| Well Location | | | |
|---|---|---|---|
| Well Name | X Coordinate (L) | Y Coordinate (L) | |
| EPA-PZ-2012-1B | 630,192.91 | 3,028,057.05 | 1 |
| EPA-PZ-2012-3B | 630,064.63 | 3,028,086.13 | 1 |
| SHP-05-46B | 630,041.84 | 3,027,946.62 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |

| | | |
|---|---|---|
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

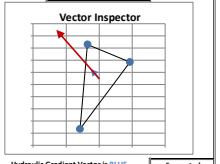
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 30 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-1B | EPA-PZ-2012-3B | SHP-05-46B |
| Maximum = | 213.71 | 213.14 | 213.77 |
| Minimum = | 210.90 | 210.20 | 210.51 |
| Average = | 212.36 | 211.68 | 212.10 |
| Range = | 2.81 | 2.94 | 3.26 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.006374 | 1.062255 |
| Minimum = | 0.004856 | 0.809337 |
| Average = | 0.005867 | 0.977770 |

10/22/19 12:00 AM



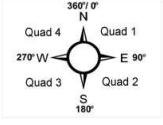

Hydraulic Gradient Vector is BLUE
Groundwater Velocity Vector is RED

| | | Suggested Scaling Factors |
|---|---|---|
| Hyd. Grad. Scale Factor = | 5,000.00 | 14,680.12 |
| Velocity Scale Factor = | 150.00 | 88.08 |

| Number of Measurements | |
|---|---|
| Date/Time | 9 |
| EPA-PZ-2012-1B | 9 |
| EPA-PZ-2012-3B | 9 |
| SHP-05-46B | 9 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,099.79 | 3,028,029.93 | 630,073.81 | 3,028,046.00 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,099.79 | 3,028,029.93 | 629,969.90 | 3,028,110.29 |

| Number of Vectors | | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 0 | 0 |
| 270 - 360 | 9 | 9 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 630,099.79 | 3,028,029.93 | |
| Triangle Area | 9,279.57 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 131.54 | (L) | EPA-PZ-2012-1B 48.94 |
| Distance #2 - #3 | 141.36 | (L) | EPA-PZ-2012-3B 86.51 |
| Distance #1 - #3 | 187.13 | (L) | SHP-05-46B 44.56 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,192.91 | 3,028,057.05 | 630,064.63 | 3,028,086.13 |
| Nodes #2-#3 | 630,064.63 | 3,028,086.13 | 630,041.84 | 3,027,946.62 |
| Nodes #1-#3 | 630,192.91 | 3,028,057.05 | 630,041.84 | 3,027,946.62 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-1B | EPA-PZ-2012-3B | SHP-05-46B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 211.02 | 210.30 | 210.74 | 0.006141 | 309.73 | 1.023531 | 309.73 | 0.00 |
| 10/20/16 0:00 | 210.90 | 210.20 | 210.51 | 0.005641 | 302.15 | 0.940241 | 302.15 | 0.00 |
| 3/2/17 0:00 | 213.18 | 212.60 | 212.93 | 0.004856 | 307.54 | 0.809337 | 307.54 | 0.00 |
| 11/2/17 0:00 | 213.18 | 212.46 | 212.86 | 0.006018 | 307.33 | 1.002995 | 307.33 | 0.00 |
| 5/22/18 0:00 | 212.81 | 212.21 | 212.72 | 0.005651 | 318.95 | 0.941868 | 318.95 | 0.00 |
| 11/1/18 0:00 | 213.10 | 212.37 | 212.86 | 0.006374 | 312.22 | 1.062255 | 312.22 | 0.00 |
| 5/13/19 0:00 | 213.71 | 213.14 | 213.77 | 0.006060 | 327.12 | 1.009962 | 327.12 | 0.00 |
| 10/22/19 0:00 | 211.73 | 210.97 | 211.30 | 0.006110 | 301.74 | 1.018284 | 301.74 | 0.00 |
| 11/4/20 0:00 | 211.60 | 210.87 | 211.22 | 0.005949 | 303.87 | 0.991455 | 303.87 | 0.00 |

| Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 0.004722857 | -0.003925403 | 9121.0529 | -0.004723 | 0.003925 | 4 | -0.787143 | 0.654234 | 4 | 630,099.79 | 3,028,029.93 | 630,076.18 | 3,028,049.56 | 630,099.79 | 3,028,029.93 | 629,981.72 | 3,028,128.07 |
| 0.00477621 | -0.003002287 | 6292.0629 | -0.004776 | 0.003002 | 4 | -0.796035 | 0.500381 | 4 | 630,099.79 | 3,028,029.93 | 630,075.91 | 3,028,044.94 | 630,099.79 | 3,028,029.93 | 629,980.39 | 3,028,104.99 |
| 0.00385066 | -0.002958611 | 6745.3642 | -0.003851 | 0.002959 | 4 | -0.641777 | 0.493102 | 4 | 630,099.79 | 3,028,029.93 | 630,080.54 | 3,028,044.73 | 630,099.79 | 3,028,029.93 | 630,003.53 | 3,028,103.90 |
| 0.004785532 | -0.003648924 | 8246.5215 | -0.004786 | 0.003649 | 4 | -0.797589 | 0.608154 | 4 | 630,099.79 | 3,028,029.93 | 630,075.87 | 3,028,048.18 | 630,099.79 | 3,028,029.93 | 629,980.16 | 3,028,121.16 |
| 0.003711127 | -0.004261885 | 10779.315 | -0.003711 | 0.004262 | 4 | -0.618521 | 0.710314 | 4 | 630,099.79 | 3,028,029.93 | 630,081.24 | 3,028,051.24 | 630,099.79 | 3,028,029.93 | 630,007.02 | 3,028,136.48 |
| 0.004719683 | -0.004283281 | 10208.809 | -0.004720 | 0.004283 | 4 | -0.786614 | 0.713880 | 4 | 630,099.79 | 3,028,029.93 | 630,076.19 | 3,028,051.35 | 630,099.79 | 3,028,029.93 | 629,981.80 | 3,028,137.02 |
| 0.003289755 | -0.005089043 | 13550.436 | -0.003290 | 0.005089 | 4 | -0.548293 | 0.848174 | 4 | 630,099.79 | 3,028,029.93 | 630,083.34 | 3,028,055.38 | 630,099.79 | 3,028,029.93 | 630,017.55 | 3,028,157.16 |
| 0.005195897 | -0.003214205 | 6670.1076 | -0.005196 | 0.003214 | 4 | -0.865983 | 0.535701 | 4 | 630,099.79 | 3,028,029.93 | 630,073.81 | 3,028,046.00 | 630,099.79 | 3,028,029.93 | 629,969.90 | 3,028,110.29 |
| 0.004939047 | -0.003315605 | 7138.8888 | -0.004939 | 0.003316 | 4 | -0.823174 | 0.552601 | 4 | 630,099.79 | 3,028,029.93 | 630,075.10 | 3,028,046.51 | 630,099.79 | 3,028,029.93 | 629,976.32 | 3,028,112.82 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 4 |
| Date: | |

| Well Name | Well Location X Coordinate (L) | Y Coordinate (L) | |
|---|---|---|---|
| EPA-PZ-2012-3B | 630,064.63 | 3,028,086.13 | 1 |
| EPA-PZ-2012-5B | 630,155.26 | 3,028,186.12 | 1 |
| SHM-96-5B | 630,158.14 | 3,028,112.94 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

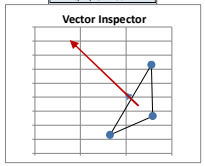
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 31 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-3B | EPA-PZ-2012-5B | SHM-96-5B |
| Maximum = | 213.14 | 213.12 | 213.42 |
| Minimum = | 210.20 | 210.45 | 210.66 |
| Average = | 211.80 | 211.92 | 212.18 |
| Range = | 2.94 | 2.67 | 2.76 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.007621 | 1.270102 |
| Minimum = | 0.005053 | 0.842102 |
| Average = | 0.006153 | 1.025549 |

10/22/19 12:00 AM

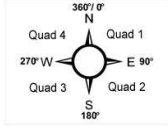



| | | Suggested Scaling Factors |
|---|---|---|
| Hydraulic Gradient Vector is BLUE | | |
| Groundwater Velocity Vector is RED | | |
| Hyd. Grad. Scale Factor = | 5,000.00 | 8,854.35 |
| Velocity Scale Factor = | 150.00 | 53.13 |

| Number of Measurements | |
|---|---|
| Date/Time | 10 |
| EPA-PZ-2012-3B | 10 |
| EPA-PZ-2012-5B | 10 |
| SHM-96-5B | 10 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,126.01 | 3,028,128.40 | 630,096.07 | 3,028,147.03 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,126.01 | 3,028,128.40 | 629,976.31 | 3,028,221.58 |

| | Number of Vectors | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 0 | 0 |
| 270 - 360 | 10 | 10 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 630,126.01 | 3,028,128.40 | |
| Triangle Area | 3,460.13 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 134.95 | (L) | EPA-PZ-2012-3B 31.81 |
| Distance #2 - #3 | 73.24 | (L) | EPA-PZ-2012-5B 44.44 |
| Distance #1 - #3 | 97.28 | (L) | SHM-96-5B 103.74 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,064.63 | 3,028,086.13 | 630,155.26 | 3,028,186.12 |
| Nodes #2-#3 | 630,155.26 | 3,028,186.12 | 630,158.14 | 3,028,112.94 |
| Nodes #1-#3 | 630,064.63 | 3,028,086.13 | 630,158.14 | 3,028,112.94 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-3B | EPA-PZ-2012-5B | SHM-96-5B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 210.30 | 210.56 | 210.75 | 0.005988 | 293.42 | 0.998008 | 293.42 | 0.00 |
| 10/20/16 0:00 | 210.20 | 210.45 | 210.66 | 0.006264 | 294.99 | 1.044048 | 294.99 | 0.00 |
| 3/2/17 0:00 | 212.60 | 212.70 | 212.93 | 0.005293 | 304.14 | 0.882149 | 304.14 | 0.00 |
| 11/2/17 0:00 | 212.46 | 212.68 | 212.84 | 0.005053 | 293.37 | 0.842102 | 293.37 | 0.00 |
| 5/22/18 0:00 | 212.21 | 212.28 | 212.54 | 0.005679 | 307.32 | 0.946551 | 307.32 | 0.00 |
| 11/1/18 0:00 | 212.37 | 212.55 | 212.82 | 0.006758 | 300.81 | 1.126364 | 300.81 | 0.00 |
| 5/13/19 0:00 | 213.14 | 213.12 | 213.42 | 0.005738 | 313.30 | 0.956333 | 313.30 | 0.00 |
| 10/22/19 0:00 | 210.97 | 211.14 | 211.43 | 0.007053 | 301.90 | 1.175520 | 301.90 | 0.00 |
| 5/18/20 0:00 | 212.89 | 212.66 | 213.13 | 0.007621 | 325.11 | 1.270102 | 325.11 | 0.00 |
| 11/4/20 0:00 | 210.87 | 211.06 | 211.29 | 0.006086 | 298.81 | 1.014312 | 298.81 | 0.00 |

| | Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 8/16/16 0:00 | 0.005494712 | -0.0023801 | 3955.4251 | -0.005495 | 0.002380 | 4 | -0.915785 | 0.396683 | 4 | 630,126.01 | 3,028,128.40 | 630,098.54 | 3,028,140.30 | 630,126.01 | 3,028,128.40 | 629,988.64 | 3,028,187.90 |
| 10/20/16 0:00 | 0.005677942 | -0.002646188 | 4645.6158 | -0.005678 | 0.002646 | 4 | -0.946324 | 0.441031 | 4 | 630,126.01 | 3,028,128.40 | 630,097.62 | 3,028,141.63 | 630,126.01 | 3,028,128.40 | 629,984.06 | 3,028,194.55 |
| 3/2/17 0:00 | 0.004380709 | -0.002970538 | 6447.5155 | -0.004381 | 0.002971 | 4 | -0.730118 | 0.495090 | 4 | 630,126.01 | 3,028,128.40 | 630,104.11 | 3,028,143.25 | 630,126.01 | 3,028,128.40 | 630,016.49 | 3,028,202.66 |
| 11/2/17 0:00 | 0.004638257 | -0.002003857 | 3357.9096 | -0.004638 | 0.002004 | 4 | -0.773043 | 0.333976 | 4 | 630,126.01 | 3,028,128.40 | 630,102.82 | 3,028,138.42 | 630,126.01 | 3,028,128.40 | 630,010.05 | 3,028,178.49 |
| 5/22/18 0:00 | 0.004516304 | -0.003443475 | 7793.7855 | -0.004516 | 0.003443 | 4 | -0.752717 | 0.573912 | 4 | 630,126.01 | 3,028,128.40 | 630,103.43 | 3,028,145.61 | 630,126.01 | 3,028,128.40 | 630,013.10 | 3,028,214.48 |
| 11/1/18 0:00 | 0.005804642 | -0.003461099 | 7035.5749 | -0.005805 | 0.003461 | 4 | -0.967440 | 0.576850 | 4 | 630,126.01 | 3,028,128.40 | 630,096.99 | 3,028,145.70 | 630,126.01 | 3,028,128.40 | 629,980.89 | 3,028,214.92 |
| 5/13/19 0:00 | 0.004176035 | -0.003935139 | 9497.9019 | -0.004176 | 0.003935 | 4 | -0.696006 | 0.655856 | 4 | 630,126.01 | 3,028,128.40 | 630,105.13 | 3,028,148.07 | 630,126.01 | 3,028,128.40 | 630,021.61 | 3,028,226.78 |
| 10/22/19 0:00 | 0.005987872 | -0.003727187 | 7724.4657 | -0.005988 | 0.003727 | 4 | -0.997979 | 0.621198 | 4 | 630,126.01 | 3,028,128.40 | 630,096.07 | 3,028,147.03 | 630,126.01 | 3,028,128.40 | 629,976.31 | 3,028,221.58 |
| 5/18/20 0:00 | 0.004358774 | -0.006250987 | 16395.108 | -0.004359 | 0.006251 | 4 | -0.726462 | 1.041831 | 4 | 630,126.01 | 3,028,128.40 | 630,104.22 | 3,028,159.65 | 630,126.01 | 3,028,128.40 | 630,017.04 | 3,028,284.67 |
| 11/4/20 0:00 | 0.005332435 | -0.002933084 | 5732.7226 | -0.005332 | 0.002933 | 4 | -0.888739 | 0.488847 | 4 | 630,126.01 | 3,028,128.40 | 630,099.35 | 3,028,143.06 | 630,126.01 | 3,028,128.40 | 629,992.70 | 3,028,201.72 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 5 |
| Date: | |

| Well Name | Well Location X Coordinate (L) | Y Coordinate (L) | |
|---|---|---|---|
| EPA-PZ-2012-1B | 630,192.91 | 3,028,057.05 | 1 |
| EPA-PZ-2012-3B | 630,064.63 | 3,028,086.13 | 1 |
| SHM-96-5B | 630,158.14 | 3,028,112.94 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

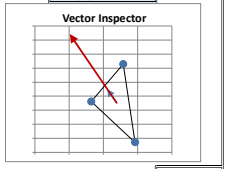
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 31 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-1B | EPA-PZ-2012-3B | SHM-96-5B |
| Maximum = | 213.71 | 213.14 | 213.42 |
| Minimum = | 210.90 | 210.20 | 210.66 |
| Average = | 212.47 | 211.80 | 212.18 |
| Range = | 2.81 | 2.94 | 2.76 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.005820 | 0.969988 |
| Minimum = | 0.004518 | 0.752926 |
| Average = | 0.005246 | 0.874251 |

10/22/19 12:00 AM

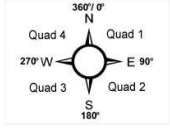



| | | Suggested Scaling Factors |
|---|---|---|
| Hydraulic Gradient Vector is BLUE | | |
| Groundwater Velocity Vector is RED | | |
| Hyd. Grad. Scale Factor = | 5,000.00 | 11,300.40 |
| Velocity Scale Factor = | 150.00 | 67.80 |

| Number of Measurements | |
|---|---|
| Date/Time | 10 |
| EPA-PZ-2012-1B | 10 |
| EPA-PZ-2012-3B | 10 |
| SHM-96-5B | 10 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,138.56 | 3,028,085.37 | 630,111.16 | 3,028,095.16 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,138.56 | 3,028,085.37 | 630,001.54 | 3,028,134.33 |

| | Number of Vectors | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 0 | 0 |
| 270 - 360 | 10 | 10 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 630,138.56 | 3,028,085.37 | |
| Triangle Area | 3,079.23 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 131.54 | (L) | EPA-PZ-2012-1B 45.34 |
| Distance #2 - #3 | 97.28 | (L) | EPA-PZ-2012-3B 28.77 |
| Distance #1 - #3 | 65.82 | (L) | SHM-96-5B 105.89 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,192.91 | 3,028,057.05 | 630,064.63 | 3,028,086.13 |
| Nodes #2-#3 | 630,064.63 | 3,028,086.13 | 630,158.14 | 3,028,112.94 |
| Nodes #1-#3 | 630,192.91 | 3,028,057.05 | 630,158.14 | 3,028,112.94 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-1B | EPA-PZ-2012-3B | SHM-96-5B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 211.02 | 210.30 | 210.75 | 0.005486 | 286.51 | 0.914250 | 286.51 | 0.00 |
| 10/20/16 0:00 | 210.90 | 210.20 | 210.66 | 0.005323 | 281.34 | 0.887239 | 281.34 | 0.00 |
| 3/2/17 0:00 | 213.18 | 212.60 | 212.93 | 0.004518 | 295.33 | 0.752926 | 295.33 | 0.00 |
| 11/2/17 0:00 | 213.18 | 212.46 | 212.84 | 0.005779 | 301.47 | 0.963148 | 301.47 | 0.00 |
| 5/22/18 0:00 | 212.81 | 212.21 | 212.54 | 0.004732 | 298.20 | 0.788689 | 298.20 | 0.00 |
| 11/1/18 0:00 | 213.10 | 212.37 | 212.82 | 0.005572 | 287.88 | 0.928664 | 287.88 | 0.00 |
| 5/13/19 0:00 | 213.71 | 213.14 | 213.42 | 0.004694 | 305.39 | 0.782387 | 305.39 | 0.00 |
| 10/22/19 0:00 | 211.73 | 210.97 | 211.43 | 0.005820 | 289.66 | 0.969988 | 289.66 | 0.00 |
| 5/18/20 0:00 | 213.44 | 212.89 | 213.13 | 0.004866 | 313.54 | 0.811036 | 313.54 | 0.00 |
| 11/4/20 0:00 | 211.60 | 210.87 | 211.29 | 0.005665 | 294.35 | 0.944184 | 294.35 | 0.00 |

| Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 0.005259298 | -0.001559005 | 1617.404 | -0.005259 | 0.001559 | 4 | -0.876550 | 0.259834 | 4 | 630,138.56 | 3,028,085.37 | 630,112.26 | 3,028,093.17 | 630,138.56 | 3,028,085.37 | 630,007.08 | 3,028,124.35 |
| 0.005219451 | -0.001047026 | 92.094384 | -0.005219 | 0.001047 | 4 | -0.869908 | 0.174504 | 4 | 630,138.56 | 3,028,085.37 | 630,112.46 | 3,028,090.61 | 630,138.56 | 3,028,085.37 | 630,008.07 | 3,028,111.55 |
| 0.004083193 | -0.001932838 | 3492.7232 | -0.004083 | 0.001933 | 4 | -0.680532 | 0.322140 | 4 | 630,138.56 | 3,028,085.37 | 630,118.14 | 3,028,095.04 | 630,138.56 | 3,028,085.37 | 630,036.48 | 3,028,133.69 |
| 0.004928761 | -0.0030171 | 6243.0591 | -0.004929 | 0.003017 | 4 | -0.821460 | 0.502850 | 4 | 630,138.56 | 3,028,085.37 | 630,113.92 | 3,028,100.46 | 630,138.56 | 3,028,085.37 | 630,015.34 | 3,028,160.80 |
| 0.00417026 | -0.002236517 | 4357.0435 | -0.004170 | 0.002237 | 4 | -0.695043 | 0.372753 | 4 | 630,138.56 | 3,028,085.37 | 630,117.71 | 3,028,096.56 | 630,138.56 | 3,028,085.37 | 630,034.30 | 3,028,141.29 |
| 0.005302832 | -0.001710845 | 2051.8292 | -0.005303 | 0.001711 | 4 | -0.883805 | 0.285141 | 4 | 630,138.56 | 3,028,085.37 | 630,112.05 | 3,028,093.93 | 630,138.56 | 3,028,085.37 | 630,005.99 | 3,028,128.14 |
| 0.003827172 | -0.002718344 | 6033.1498 | -0.003827 | 0.002718 | 4 | -0.637862 | 0.453057 | 4 | 630,138.56 | 3,028,085.37 | 630,119.42 | 3,028,098.97 | 630,138.56 | 3,028,085.37 | 630,042.88 | 3,028,153.33 |
| 0.005480652 | -0.001958065 | 2686.9954 | -0.005481 | 0.001958 | 4 | -0.913442 | 0.326344 | 4 | 630,138.56 | 3,028,085.37 | 630,111.16 | 3,028,095.16 | 630,138.56 | 3,028,085.37 | 630,001.54 | 3,028,134.33 |
| 0.003527616 | -0.003352011 | 8140.4413 | -0.003528 | 0.003352 | 4 | -0.587936 | 0.558668 | 4 | 630,138.56 | 3,028,085.37 | 630,120.92 | 3,028,102.13 | 630,138.56 | 3,028,085.37 | 630,050.37 | 3,028,169.17 |
| 0.005161173 | -0.002335743 | 4031.8271 | -0.005161 | 0.002336 | 4 | -0.860196 | 0.389290 | 4 | 630,138.56 | 3,028,085.37 | 630,112.75 | 3,028,097.05 | 630,138.56 | 3,028,085.37 | 630,009.53 | 3,028,143.77 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 6 |
| Date: | |

| Well Name | Well Location X Coordinate (L) | Y Coordinate (L) | |
|---|---|---|---|
| EPA-PZ-2012-1B | 630,192.91 | 3,028,057.05 | 1 |
| EPA-PZ-2012-2B | 630,290.40 | 3,028,124.72 | 1 |
| SHM-96-5B | 630,158.14 | 3,028,112.94 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

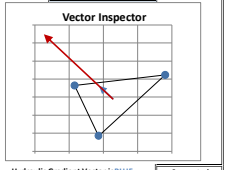
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 31 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-1B | EPA-PZ-2012-2B | SHM-96-5B |
| Maximum = | 213.71 | 213.60 | 213.42 |
| Minimum = | 210.90 | 211.15 | 210.66 |
| Average = | 212.47 | 212.56 | 212.18 |
| Range = | 2.81 | 2.45 | 2.76 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.005300 | 0.883295 |
| Minimum = | 0.003862 | 0.643589 |
| Average = | 0.004577 | 0.762792 |

10/22/19 12:00 AM

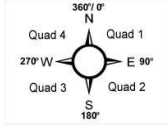



| Hydraulic Gradient Vector is BLUE<br>Groundwater Velocity Vector is RED | | Suggested Scaling Factors |
|---|---|---|
| Hyd. Grad. Scale Factor = | 5,000.00 | 12,527.32 |
| Velocity Scale Factor = | 150.00 | 75.16 |

| Number of Measurements | |
|---|---|
| Date/Time | 10 |
| EPA-PZ-2012-1B | 10 |
| EPA-PZ-2012-2B | 10 |
| SHM-96-5B | 10 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,213.82 | 3,028,098.24 | 630,193.64 | 3,028,112.52 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,213.82 | 3,028,098.24 | 630,112.94 | 3,028,169.67 |

| Number of Vectors | | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 0 | 0 |
| 270 - 360 | 10 | 10 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 630,213.82 | 3,028,098.24 | |
| Triangle Area | 3,900.81 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 118.67 | (L) | EPA-PZ-2012-1B 87.12 |
| Distance #2 - #3 | 132.78 | (L) | EPA-PZ-2012-2B 29.68 |
| Distance #1 - #3 | 65.82 | (L) | SHM-96-5B 63.20 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,192.91 | 3,028,057.05 | 630,290.40 | 3,028,124.72 |
| Nodes #2-#3 | 630,290.40 | 3,028,124.72 | 630,158.14 | 3,028,112.94 |
| Nodes #1-#3 | 630,192.91 | 3,028,057.05 | 630,158.14 | 3,028,112.94 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-1B | EPA-PZ-2012-2B | SHM-96-5B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 211.02 | 211.25 | 210.75 | 0.004630 | 300.49 | 0.771622 | 300.49 | 0.00 |
| 10/20/16 0:00 | 210.90 | 211.15 | 210.66 | 0.004307 | 295.95 | 0.717838 | 295.95 | 0.00 |
| 3/2/17 0:00 | 213.18 | 213.24 | 212.93 | 0.003862 | 317.71 | 0.643589 | 317.71 | 0.00 |
| 11/2/17 0:00 | 213.18 | 213.26 | 212.84 | 0.005249 | 317.86 | 0.874877 | 317.86 | 0.00 |
| 5/22/18 0:00 | 212.81 | 212.84 | 212.54 | 0.004128 | 321.72 | 0.687926 | 321.72 | 0.00 |
| 11/1/18 0:00 | 213.10 | 213.08 | 212.82 | 0.004254 | 327.51 | 0.709012 | 327.51 | 0.00 |
| 5/13/19 0:00 | 213.71 | 213.60 | 213.42 | 0.004381 | 336.89 | 0.730175 | 336.89 | 0.00 |
| 10/22/19 0:00 | 211.73 | 211.93 | 211.43 | 0.004944 | 305.31 | 0.824045 | 305.31 | 0.00 |
| 5/18/20 0:00 | 213.44 | 213.39 | 213.13 | 0.004713 | 330.36 | 0.785539 | 330.36 | 0.00 |
| 11/4/20 0:00 | 211.60 | 211.86 | 211.29 | 0.005300 | 300.82 | 0.883295 | 300.82 | 0.00 |

| Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 0.003989631 | -0.00234889 | 4809.3569 | -0.003990 | 0.002349 | 4 | -0.664939 | 0.391482 | 4 | 630,213.82 | 3,028,098.24 | 630,193.87 | 3,028,109.98 | 630,213.82 | 3,028,098.24 | 630,114.08 | 3,028,156.96 |
| 0.003872694 | -0.00188487 | 3477.8501 | -0.003873 | 0.001885 | 4 | -0.645449 | 0.314145 | 4 | 630,213.82 | 3,028,098.24 | 630,194.45 | 3,028,107.66 | 630,213.82 | 3,028,098.24 | 630,117.00 | 3,028,145.36 |
| 0.002598291 | -0.002856625 | 7225.7788 | -0.002598 | 0.002857 | 4 | -0.433049 | 0.476104 | 4 | 630,213.82 | 3,028,098.24 | 630,200.83 | 3,028,112.52 | 630,213.82 | 3,028,098.24 | 630,148.86 | 3,028,169.65 |
| 0.003522214 | -0.003892141 | 9779.1305 | -0.003522 | 0.003892 | 4 | -0.587036 | 0.648690 | 4 | 630,213.82 | 3,028,098.24 | 630,196.21 | 3,028,117.70 | 630,213.82 | 3,028,098.24 | 630,125.76 | 3,028,195.54 |
| 0.002556851 | -0.003240252 | 8413.1684 | -0.002557 | 0.003240 | 4 | -0.426142 | 0.540042 | 4 | 630,213.82 | 3,028,098.24 | 630,201.03 | 3,028,114.44 | 630,213.82 | 3,028,098.24 | 630,149.90 | 3,028,179.24 |
| 0.002285394 | -0.003588054 | 9637.692 | -0.002285 | 0.003588 | 4 | -0.380899 | 0.598009 | 4 | 630,213.82 | 3,028,098.24 | 630,202.39 | 3,028,116.18 | 630,213.82 | 3,028,098.24 | 630,156.68 | 3,028,187.94 |
| 0.001719831 | -0.004029363 | 11331.02 | -0.001720 | 0.004029 | 4 | -0.286638 | 0.671560 | 4 | 630,213.82 | 3,028,098.24 | 630,205.22 | 3,028,118.38 | 630,213.82 | 3,028,098.24 | 630,170.82 | 3,028,198.97 |
| 0.004034929 | -0.002857479 | 6321.5548 | -0.004035 | 0.002857 | 4 | -0.672488 | 0.476246 | 4 | 630,213.82 | 3,028,098.24 | 630,193.64 | 3,028,112.52 | 630,213.82 | 3,028,098.24 | 630,112.94 | 3,028,169.67 |
| 0.002330691 | -0.004096642 | 11149.52 | -0.002331 | 0.004097 | 4 | -0.388449 | 0.682774 | 4 | 630,213.82 | 3,028,098.24 | 630,202.16 | 3,028,118.72 | 630,213.82 | 3,028,098.24 | 630,155.55 | 3,028,200.65 |
| 0.004551501 | -0.002715032 | 5564.5465 | -0.004552 | 0.002715 | 4 | -0.758584 | 0.452505 | 4 | 630,213.82 | 3,028,098.24 | 630,191.06 | 3,028,111.81 | 630,213.82 | 3,028,098.24 | 630,100.03 | 3,028,166.11 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 7 |
| Date: | |

| Well Name | Well Location X Coordinate (L) | Y Coordinate (L) | |
|---|---|---|---|
| EPA-PZ-2012-5B | 630,155.26 | 3,028,186.12 | 1 |
| EPA-PZ-2012-2B | 630,290.40 | 3,028,124.72 | 1 |
| SHM-96-5B | 630,158.14 | 3,028,112.94 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

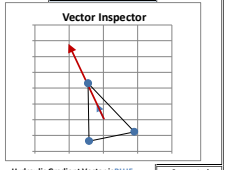
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 31 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-5B | EPA-PZ-2012-2B | SHM-96-5B |
| Maximum = | 213.12 | 213.60 | 213.42 |
| Minimum = | 210.45 | 211.15 | 210.66 |
| Average = | 211.92 | 212.56 | 212.18 |
| Range = | 2.67 | 2.45 | 2.76 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.006810 | 1.134999 |
| Minimum = | 0.003937 | 0.656156 |
| Average = | 0.004830 | 0.804937 |

10/22/19 12:00 AM

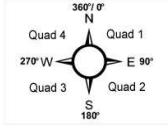



| Hydraulic Gradient Vector is BLUE<br>Groundwater Velocity Vector is RED | | Suggested Scaling Factors |
|---|---|---|
| Hyd. Grad. Scale Factor = | 5,000.00 | 10,898.29 |
| Velocity Scale Factor = | 150.00 | 65.39 |

| Number of Measurements | |
|---|---|
| Date/Time | 10 |
| EPA-PZ-2012-5B | 10 |
| EPA-PZ-2012-2B | 10 |
| SHM-96-5B | 10 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,201.27 | 3,028,141.26 | 630,180.67 | 3,028,160.26 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,201.27 | 3,028,141.26 | 630,098.29 | 3,028,236.28 |

| Orientation (deg) | Number of Vectors i-vector | V-vector |
|---|---|---|
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 0 | 0 |
| 270 - 360 | 10 | 10 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 630,201.27 | 3,028,141.26 | |
| Triangle Area | 4,856.36 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 148.43 | (L) | EPA-PZ-2012-5B 63.31 |
| Distance #2 - #3 | 132.78 | (L) | EPA-PZ-2012-2B 29.52 |
| Distance #1 - #3 | 73.24 | (L) | SHM-96-5B 87.16 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,155.26 | 3,028,186.12 | 630,290.40 | 3,028,124.72 |
| Nodes #2-#3 | 630,290.40 | 3,028,124.72 | 630,158.14 | 3,028,112.94 |
| Nodes #1-#3 | 630,155.26 | 3,028,186.12 | 630,158.14 | 3,028,112.94 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-5B | EPA-PZ-2012-2B | SHM-96-5B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 210.56 | 211.25 | 210.75 | 0.004683 | 301.39 | 0.780492 | 301.39 | 0.00 |
| 10/20/16 0:00 | 210.45 | 211.15 | 210.66 | 0.004790 | 304.52 | 0.798314 | 304.52 | 0.00 |
| 3/2/17 0:00 | 212.70 | 213.24 | 212.93 | 0.004010 | 319.30 | 0.668292 | 319.30 | 0.00 |
| 11/2/17 0:00 | 212.68 | 213.26 | 212.84 | 0.003937 | 301.45 | 0.656156 | 301.45 | 0.00 |
| 5/22/18 0:00 | 212.28 | 212.84 | 212.54 | 0.004365 | 323.74 | 0.727495 | 323.74 | 0.00 |
| 11/1/18 0:00 | 212.55 | 213.08 | 212.82 | 0.004264 | 327.58 | 0.710721 | 327.58 | 0.00 |
| 5/13/19 0:00 | 213.12 | 213.60 | 213.42 | 0.004383 | 336.90 | 0.730561 | 336.90 | 0.00 |
| 10/22/19 0:00 | 211.14 | 211.93 | 211.43 | 0.005605 | 312.70 | 0.934096 | 312.70 | 0.00 |
| 5/18/20 0:00 | 212.66 | 213.39 | 213.13 | 0.006810 | 338.20 | 1.134999 | 338.20 | 0.00 |
| 11/4/20 0:00 | 211.06 | 211.86 | 211.29 | 0.005449 | 302.94 | 0.908245 | 302.94 | 0.00 |

| Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 0.003997658 | -0.002439015 | 5077.2067 | -0.003998 | 0.002439 | 4 | -0.666276 | 0.406503 | 4 | 630,201.27 | 3,028,141.26 | 630,181.28 | 3,028,153.46 | 630,201.27 | 3,028,141.26 | 630,101.33 | 3,028,202.24 |
| 0.00394657 | -0.002714325 | 5942.9778 | -0.003947 | 0.002714 | 4 | -0.657762 | 0.452387 | 4 | 630,201.27 | 3,028,141.26 | 630,181.53 | 3,028,154.83 | 630,201.27 | 3,028,141.26 | 630,102.60 | 3,028,209.12 |
| 0.002614627 | -0.00304004 | 7770.8872 | -0.002615 | 0.003040 | 4 | -0.435771 | 0.506673 | 4 | 630,201.27 | 3,028,141.26 | 630,188.19 | 3,028,156.46 | 630,201.27 | 3,028,141.26 | 630,135.90 | 3,028,217.26 |
| 0.003358518 | -0.00205422 | 4316.8517 | -0.003359 | 0.002054 | 4 | -0.559753 | 0.342370 | 4 | 630,201.27 | 3,028,141.26 | 630,184.47 | 3,028,151.53 | 630,201.27 | 3,028,141.26 | 630,117.30 | 3,028,192.62 |
| 0.002581732 | -0.003519608 | 9243.411 | -0.002582 | 0.003520 | 4 | -0.430289 | 0.586601 | 4 | 630,201.27 | 3,028,141.26 | 630,188.36 | 3,028,158.86 | 630,201.27 | 3,028,141.26 | 630,136.72 | 3,028,229.25 |
| 0.002286418 | -0.003599554 | 9671.872 | -0.002286 | 0.003600 | 4 | -0.381070 | 0.599926 | 4 | 630,201.27 | 3,028,141.26 | 630,189.83 | 3,028,159.26 | 630,201.27 | 3,028,141.26 | 630,144.11 | 3,028,231.25 |
| 0.001720047 | -0.004031791 | 11338.238 | -0.001720 | 0.004032 | 4 | -0.286675 | 0.671965 | 4 | 630,201.27 | 3,028,141.26 | 630,192.67 | 3,028,161.42 | 630,201.27 | 3,028,141.26 | 630,158.27 | 3,028,242.05 |
| 0.004118941 | -0.003800736 | 9124.9045 | -0.004119 | 0.003801 | 4 | -0.686490 | 0.633456 | 4 | 630,201.27 | 3,028,141.26 | 630,180.67 | 3,028,160.26 | 630,201.27 | 3,028,141.26 | 630,098.29 | 3,028,236.28 |
| 0.002528983 | -0.006322996 | 17766.218 | -0.002529 | 0.006323 | 4 | -0.421497 | 1.053833 | 4 | 630,201.27 | 3,028,141.26 | 630,188.62 | 3,028,172.88 | 630,201.27 | 3,028,141.26 | 630,138.04 | 3,028,299.33 |
| 0.004573582 | -0.002962948 | 6301.351 | -0.004574 | 0.002963 | 4 | -0.762264 | 0.493825 | 4 | 630,201.27 | 3,028,141.26 | 630,178.40 | 3,028,156.07 | 630,201.27 | 3,028,141.26 | 630,086.93 | 3,028,215.33 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 8 |
| Date: | |

| Well Name | Well Location X Coordinate (L) | Y Coordinate (L) | |
|---|---|---|---|
| EPA-PZ-2012-1B | 630,192.91 | 3,028,057.05 | 1 |
| SHP-05-46B | 630,041.84 | 3,027,946.62 | 1 |
| SHM-10-06 | 630,215.62 | 3,027,882.54 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

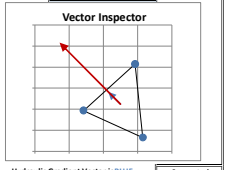
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 30 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-1B | SHP-05-46B | SHM-10-06 |
| Maximum = | 213.71 | 213.77 | 215.04 |
| Minimum = | 210.90 | 209.74 | 212.04 |
| Average = | 212.36 | 211.99 | 213.54 |
| Range = | 2.81 | 4.03 | 3.00 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.013351 | 2.225211 |
| Minimum = | 0.007862 | 1.310404 |
| Average = | 0.009106 | 1.517733 |

10/22/19 12:00 AM

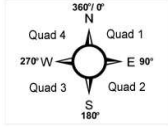



| Hydraulic Gradient Vector is BLUE<br>Groundwater Velocity Vector is RED | | Suggested Scaling Factors |
|---|---|---|
| Hyd. Grad. Scale Factor = | 5,000.00 | 7,007.89 |
| Velocity Scale Factor = | 150.00 | 42.05 |

| Number of Measurements | |
|---|---|
| Date/Time | 9 |
| EPA-PZ-2012-1B | 9 |
| SHP-05-46B | 9 |
| SHM-10-06 | 9 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,150.12 | 3,027,962.07 | 630,114.56 | 3,027,991.25 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,150.12 | 3,027,962.07 | 629,972.31 | 3,028,107.97 |

| Number of Vectors | | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 0 | 0 |
| 270 - 360 | 9 | 9 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 630,150.12 | 3,027,962.07 | |
| Triangle Area | 14,435.58 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 187.13 | (L) | EPA-PZ-2012-1B 61.25 |
| Distance #2 - #3 | 185.22 | (L) | SHP-05-46B 56.41 |
| Distance #1 - #3 | 175.98 | (L) | SHM-10-06 62.34 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,192.91 | 3,028,057.05 | 630,041.84 | 3,027,946.62 |
| Nodes #2-#3 | 630,041.84 | 3,027,946.62 | 630,215.62 | 3,027,882.54 |
| Nodes #1-#3 | 630,192.91 | 3,028,057.05 | 630,215.62 | 3,027,882.54 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-1B | SHP-05-46B | SHM-10-06 | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 211.02 | 209.74 | 212.21 | 0.013351 | 293.01 | 2.225211 | 293.01 | 0.00 |
| 10/20/16 0:00 | 210.90 | 210.51 | 212.04 | 0.008783 | 310.11 | 1.463873 | 310.11 | 0.00 |
| 3/2/17 0:00 | 213.18 | 212.93 | 214.29 | 0.008058 | 314.10 | 1.343030 | 314.10 | 0.00 |
| 11/2/17 0:00 | 213.18 | 212.86 | 214.31 | 0.008437 | 312.14 | 1.406241 | 312.14 | 0.00 |
| 5/22/18 0:00 | 212.81 | 212.72 | 214.13 | 0.008833 | 320.71 | 1.472094 | 320.71 | 0.00 |
| 11/1/18 0:00 | 213.10 | 212.86 | 214.36 | 0.008963 | 315.61 | 1.493768 | 315.61 | 0.00 |
| 5/13/19 0:00 | 213.71 | 213.77 | 215.04 | 0.008469 | 326.18 | 1.411559 | 326.18 | 0.00 |
| 10/22/19 0:00 | 211.73 | 211.30 | 212.91 | 0.009201 | 309.37 | 1.533417 | 309.37 | 0.00 |
| 11/4/20 0:00 | 211.60 | 211.22 | 212.60 | 0.007862 | 308.87 | 1.310404 | 308.87 | 0.00 |

| Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 0.012288562 | -0.005219912 | 8273.0465 | -0.012289 | 0.005220 | 4 | -2.048094 | 0.869985 | 4 | 630,150.12 | 3,027,962.07 | 630,088.68 | 3,027,988.17 | 630,150.12 | 3,027,962.07 | 629,842.91 | 3,028,092.57 |
| 0.006717758 | -0.005658354 | 13111.235 | -0.006718 | 0.005658 | 4 | -1.119626 | 0.943059 | 4 | 630,150.12 | 3,027,962.07 | 630,116.53 | 3,027,990.36 | 630,150.12 | 3,027,962.07 | 629,982.18 | 3,028,103.53 |
| 0.00578701 | -0.005607567 | 13546.282 | -0.005787 | 0.005608 | 4 | -0.964502 | 0.934595 | 4 | 630,150.12 | 3,027,962.07 | 630,121.19 | 3,027,990.11 | 630,150.12 | 3,027,962.07 | 630,005.45 | 3,028,102.26 |
| 0.006256397 | -0.00566109 | 13412.546 | -0.006256 | 0.005661 | 4 | -1.042733 | 0.943515 | 4 | 630,150.12 | 3,027,962.07 | 630,118.84 | 3,027,990.38 | 630,150.12 | 3,027,962.07 | 629,993.71 | 3,028,103.60 |
| 0.005592912 | -0.006836195 | 17388.585 | -0.005593 | 0.006836 | 4 | -0.932152 | 1.139366 | 4 | 630,150.12 | 3,027,962.07 | 630,122.16 | 3,027,996.25 | 630,150.12 | 3,027,962.07 | 630,010.30 | 3,028,132.97 |
| 0.006270083 | -0.006404251 | 15654.177 | -0.006270 | 0.006404 | 4 | -1.045014 | 1.067375 | 4 | 630,150.12 | 3,027,962.07 | 630,118.77 | 3,027,994.09 | 630,150.12 | 3,027,962.07 | 629,993.37 | 3,028,122.18 |
| 0.004713396 | -0.007036606 | 18550.599 | -0.004713 | 0.007037 | 4 | -0.785566 | 1.172768 | 4 | 630,150.12 | 3,027,962.07 | 630,126.56 | 3,027,997.25 | 630,150.12 | 3,027,962.07 | 630,032.29 | 3,028,137.99 |
| 0.007112533 | -0.005836193 | 13401.787 | -0.007113 | 0.005836 | 4 | -1.185422 | 0.972699 | 4 | 630,150.12 | 3,027,962.07 | 630,114.56 | 3,027,991.25 | 630,150.12 | 3,027,962.07 | 629,972.31 | 3,028,107.97 |
| 0.006121823 | -0.004933661 | 11293.076 | -0.006122 | 0.004934 | 4 | -1.020304 | 0.822277 | 4 | 630,150.12 | 3,027,962.07 | 630,119.51 | 3,027,986.74 | 630,150.12 | 3,027,962.07 | 629,997.08 | 3,028,085.41 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 9 |
| Date: | |

| Well Name | Well Location X Coordinate (L) | Y Coordinate (L) | |
|---|---|---|---|
| EPA-PZ-2012-3B | 630,064.63 | 3,028,086.13 | 1 |
| EPA-PZ-2012-5B | 630,155.26 | 3,028,186.12 | 1 |
| SHP-2016-3B | 630,007.26 | 3,028,174.29 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

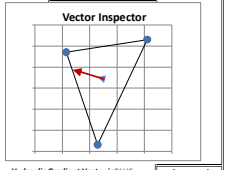
| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 31 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-3B | EPA-PZ-2012-5B | SHP-2016-3B |
| Maximum = | 213.14 | 213.12 | 212.97 |
| Minimum = | 210.20 | 210.45 | 210.05 |
| Average = | 211.80 | 211.92 | 211.63 |
| Range = | 2.94 | 2.67 | 2.92 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.003059 | 0.509760 |
| Minimum = | 0.001597 | 0.266133 |
| Average = | 0.002361 | 0.393428 |

10/22/19 12:00 AM

**Vector Inspector**

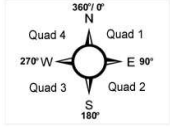


| | | Suggested Scaling Factors |
|---|---|---|
| Hydraulic Gradient Vector is BLUE | | |
| Groundwater Velocity Vector is RED | | |
| Hyd. Grad. Scale Factor = | 5,000.00 | 24,271.56 |
| Velocity Scale Factor = | 150.00 | 145.63 |

| Number of Measurements | |
|---|---|
| Date/Time | 10 |
| EPA-PZ-2012-3B | 10 |
| EPA-PZ-2012-5B | 10 |
| SHP-2016-3B | 10 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,075.72 | 3,028,148.85 | 630,064.43 | 3,028,150.58 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,075.72 | 3,028,148.85 | 630,019.28 | 3,028,157.49 |

| Number of Vectors | | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 1 | 1 |
| 270 - 360 | 9 | 9 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 630,075.72 | 3,028,148.85 | |
| Triangle Area | 6,863.18 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 134.95 | (L) | EPA-PZ-2012-3B 75.24 |
| Distance #2 - #3 | 148.47 | (L) | EPA-PZ-2012-5B 43.24 |
| Distance #1 - #3 | 105.18 | (L) | SHP-2016-3B 61.52 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,064.63 | 3,028,086.13 | 630,155.26 | 3,028,186.12 |
| Nodes #2-#3 | 630,155.26 | 3,028,186.12 | 630,007.26 | 3,028,174.29 |
| Nodes #1-#3 | 630,064.63 | 3,028,086.13 | 630,007.26 | 3,028,174.29 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-3B | EPA-PZ-2012-5B | SHP-2016-3B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 210.30 | 210.56 | 210.11 | 0.003059 | 273.15 | 0.509760 | 273.15 | 0.00 |
| 10/20/16 0:00 | 210.20 | 210.45 | 210.05 | 0.002699 | 268.84 | 0.449816 | 268.84 | 0.00 |
| 3/2/17 0:00 | 212.60 | 212.70 | 212.40 | 0.002285 | 293.27 | 0.380831 | 293.27 | 0.00 |
| 11/2/17 0:00 | 212.46 | 212.68 | 212.32 | 0.002433 | 270.11 | 0.405471 | 270.11 | 0.00 |
| 5/22/18 0:00 | 212.21 | 212.28 | 212.03 | 0.001957 | 297.94 | 0.326126 | 297.94 | 0.00 |
| 11/1/18 0:00 | 212.37 | 212.55 | 212.23 | 0.002183 | 274.52 | 0.363784 | 274.52 | 0.00 |
| 5/13/19 0:00 | 213.14 | 213.12 | 212.97 | 0.001597 | 316.18 | 0.266133 | 316.18 | 0.00 |
| 10/22/19 0:00 | 210.97 | 211.14 | 210.81 | 0.002284 | 278.71 | 0.380621 | 278.71 | 0.00 |
| 5/18/20 0:00 | 212.89 | 212.66 | 212.63 | 0.002710 | 351.15 | 0.451702 | 351.15 | 0.00 |
| 11/4/20 0:00 | 210.87 | 211.06 | 210.71 | 0.002400 | 276.27 | 0.400035 | 276.27 | 0.00 |

| | Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 8/16/16 0:00 | 0.003053954 | -0.000167817 | -1205.723 | -0.003054 | 0.000168 | 4 | -0.508992 | 0.027970 | 4 | 630,075.72 | 3,028,148.85 | 630,060.45 | 3,028,149.69 | 630,075.72 | 3,028,148.85 | 629,999.37 | 3,028,153.04 |
| 10/20/16 0:00 | 0.002698346 | 5.44923E-05 | -1654.94 | -0.002698 | -0.000054 | 3 | -0.449724 | -0.009082 | 3 | 630,075.72 | 3,028,148.85 | 630,062.22 | 3,028,148.57 | 630,075.72 | 3,028,148.85 | 630,008.26 | 3,028,147.48 |
| 3/2/17 0:00 | 0.002099171 | -0.000902571 | 1623.0495 | -0.002099 | 0.000903 | 4 | -0.349862 | 0.150429 | 4 | 630,075.72 | 3,028,148.85 | 630,065.22 | 3,028,153.36 | 630,075.72 | 3,028,148.85 | 630,023.24 | 3,028,171.41 |
| 11/2/17 0:00 | 0.002432821 | -4.86782E-06 | -1305.634 | -0.002433 | 0.000005 | 4 | -0.405470 | 0.000811 | 4 | 630,075.72 | 3,028,148.85 | 630,063.55 | 3,028,148.87 | 630,075.72 | 3,028,148.85 | 630,014.90 | 3,028,148.97 |
| 5/22/18 0:00 | 0.001728687 | -0.000916803 | 1899.1827 | -0.001729 | 0.000917 | 4 | -0.288115 | 0.152800 | 4 | 630,075.72 | 3,028,148.85 | 630,067.07 | 3,028,153.43 | 630,075.72 | 3,028,148.85 | 630,032.50 | 3,028,171.77 |
| 11/1/18 0:00 | 0.002175914 | -0.00017205 | -637.6152 | -0.002176 | 0.000172 | 4 | -0.362652 | 0.028675 | 4 | 630,075.72 | 3,028,148.85 | 630,064.84 | 3,028,149.71 | 630,075.72 | 3,028,148.85 | 630,021.32 | 3,028,153.15 |
| 5/13/19 0:00 | 0.001105606 | -0.001152127 | 3005.2716 | -0.001106 | 0.001152 | 4 | -0.184268 | 0.192021 | 4 | 630,075.72 | 3,028,148.85 | 630,070.19 | 3,028,154.61 | 630,075.72 | 3,028,148.85 | 630,048.08 | 3,028,177.65 |
| 10/22/19 0:00 | 0.002257378 | -0.000345898 | -163.9158 | -0.002257 | 0.000346 | 4 | -0.376230 | 0.057650 | 4 | 630,075.72 | 3,028,148.85 | 630,064.43 | 3,028,150.58 | 630,075.72 | 3,028,148.85 | 630,019.28 | 3,028,157.49 |
| 5/18/20 0:00 | 0.000416761 | -0.002677979 | 8059.4557 | -0.000417 | 0.002678 | 4 | -0.069460 | 0.446330 | 4 | 630,075.72 | 3,028,148.85 | 630,073.63 | 3,028,162.24 | 630,075.72 | 3,028,148.85 | 630,065.30 | 3,028,215.80 |
| 11/4/20 0:00 | 0.002385831 | -0.000262307 | -498.0703 | -0.002386 | 0.000262 | 4 | -0.397639 | 0.043718 | 4 | 630,075.72 | 3,028,148.85 | 630,063.79 | 3,028,150.16 | 630,075.72 | 3,028,148.85 | 630,016.07 | 3,028,155.40 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 10 |
| Date: | |

| Well Location | | | |
|---|---|---|---|
| Well Name | X Coordinate (L) | Y Coordinate (L) | |
| EPA-PZ-2012-5B | 630,155.26 | 3,028,186.12 | 1 |
| SHP-2016-3B | 630,007.26 | 3,028,174.29 | 1 |
| SHM-05-42B | 630,017.63 | 3,028,376.14 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

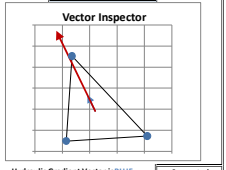
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 30 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-5B | SHP-2016-3B | SHM-05-42B |
| Maximum = | 213.12 | 212.97 | 212.81 |
| Minimum = | 210.45 | 210.05 | 209.30 |
| Average = | 211.84 | 211.51 | 211.33 |
| Range = | 2.67 | 2.92 | 3.51 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.008138 | 1.356344 |
| Minimum = | 0.001374 | 0.229051 |
| Average = | 0.002912 | 0.485356 |

10/22/19 12:00 AM

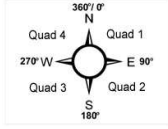



| | | Suggested Scaling Factors |
|---|---|---|
| Hydraulic Gradient Vector is BLUE | | |
| Groundwater Velocity Vector is RED | | |
| Hyd. Grad. Scale Factor = | 5,000.00 | 14,415.38 |
| Velocity Scale Factor = | 150.00 | 86.49 |

| Number of Measurements | |
|---|---|
| Date/Time | 9 |
| EPA-PZ-2012-5B | 9 |
| SHP-2016-3B | 9 |
| SHM-05-42B | 9 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,060.05 | 3,028,245.52 | 630,045.85 | 3,028,283.65 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,060.05 | 3,028,245.52 | 629,989.07 | 3,028,436.18 |

| Number of Vectors | | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 3 | 3 |
| 270 - 360 | 6 | 6 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 630,060.05 | 3,028,245.52 | |
| Triangle Area | 14,875.56 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 148.47 | (L) | EPA-PZ-2012-5B 58.65 |
| Distance #2 - #3 | 202.12 | (L) | SHP-2016-3B 82.49 |
| Distance #1 - #3 | 234.63 | (L) | SHM-05-42B 38.86 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,155.26 | 3,028,186.12 | 630,007.26 | 3,028,174.29 |
| Nodes #2-#3 | 630,007.26 | 3,028,174.29 | 630,017.63 | 3,028,376.14 |
| Nodes #1-#3 | 630,155.26 | 3,028,186.12 | 630,017.63 | 3,028,376.14 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-5B | SHP-2016-3B | SHM-05-42B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 210.56 | 210.11 | 210.21 | 0.003033 | 263.55 | 0.505417 | 263.55 | 0.00 |
| 10/20/16 0:00 | 210.45 | 210.05 | 210.12 | 0.002694 | 265.56 | 0.449019 | 265.56 | 0.00 |
| 3/2/17 0:00 | 212.70 | 212.40 | 212.36 | 0.002074 | 278.42 | 0.345605 | 278.42 | 0.00 |
| 11/2/17 0:00 | 212.68 | 212.32 | 212.28 | 0.002480 | 277.52 | 0.413281 | 277.52 | 0.00 |
| 5/22/18 0:00 | 212.28 | 212.03 | 211.96 | 0.001745 | 284.39 | 0.290801 | 284.39 | 0.00 |
| 11/1/18 0:00 | 212.55 | 212.23 | 212.12 | 0.002311 | 286.56 | 0.385118 | 286.56 | 0.00 |
| 5/13/19 0:00 | 213.12 | 212.97 | 212.81 | 0.001374 | 308.11 | 0.229051 | 308.11 | 0.00 |
| 10/22/19 0:00 | 211.14 | 210.81 | 209.30 | 0.008138 | 339.58 | 1.356344 | 339.58 | 0.00 |
| 11/4/20 0:00 | 211.06 | 210.71 | 210.80 | 0.002361 | 262.07 | 0.393567 | 262.07 | 0.00 |

| | Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 8/16/16 0:00 | 0.003013314 | 0.000340608 | -2719.721 | -0.003013 | -0.000341 | 3 | -0.502219 | -0.056768 | 3 | 630,060.05 | 3,028,245.52 | 630,044.98 | 3,028,243.81 | 630,060.05 | 3,028,245.52 | 629,984.72 | 3,028,237.00 |
| 10/20/16 0:00 | 0.002686012 | 0.000208798 | -2114.434 | -0.002686 | -0.000209 | 3 | -0.447669 | -0.034800 | 3 | 630,060.05 | 3,028,245.52 | 630,046.62 | 3,028,244.47 | 630,060.05 | 3,028,245.52 | 629,992.90 | 3,028,240.30 |
| 3/2/17 0:00 | 0.00205129 | -0.000303552 | -160.719 | -0.002051 | 0.000304 | 4 | -0.341882 | 0.050592 | 4 | 630,060.05 | 3,028,245.52 | 630,049.79 | 3,028,247.03 | 630,060.05 | 3,028,245.52 | 630,008.77 | 3,028,253.11 |
| 11/2/17 0:00 | 0.002458367 | -0.000324466 | -353.9304 | -0.002458 | 0.000324 | 4 | -0.409728 | 0.054078 | 4 | 630,060.05 | 3,028,245.52 | 630,047.76 | 3,028,247.14 | 630,060.05 | 3,028,245.52 | 629,998.59 | 3,028,253.63 |
| 5/22/18 0:00 | 0.001690065 | -0.000433619 | 460.35173 | -0.001690 | 0.000434 | 4 | -0.281678 | 0.072270 | 4 | 630,060.05 | 3,028,245.52 | 630,051.60 | 3,028,247.68 | 630,060.05 | 3,028,245.52 | 630,017.80 | 3,028,256.36 |
| 11/1/18 0:00 | 0.002214817 | -0.000658746 | 811.67554 | -0.002215 | 0.000659 | 4 | -0.369136 | 0.109791 | 4 | 630,060.05 | 3,028,245.52 | 630,048.98 | 3,028,248.81 | 630,060.05 | 3,028,245.52 | 630,004.68 | 3,028,261.99 |
| 5/13/19 0:00 | 0.001081314 | -0.00084822 | 2100.2938 | -0.001081 | 0.000848 | 4 | -0.180219 | 0.141370 | 4 | 630,060.05 | 3,028,245.52 | 630,054.64 | 3,028,249.76 | 630,060.05 | 3,028,245.52 | 630,033.02 | 3,028,266.72 |
| 10/22/19 0:00 | 0.002839349 | -0.007626675 | 21516.9 | -0.002839 | 0.007627 | 4 | -0.473225 | 1.271112 | 4 | 630,060.05 | 3,028,245.52 | 630,045.85 | 3,028,283.65 | 630,060.05 | 3,028,245.52 | 629,989.07 | 3,028,436.18 |
| 11/4/20 0:00 | 0.002338829 | 0.000325718 | -2249.101 | -0.002339 | -0.000326 | 3 | -0.389805 | -0.054286 | 3 | 630,060.05 | 3,028,245.52 | 630,048.36 | 3,028,243.89 | 630,060.05 | 3,028,245.52 | 630,001.58 | 3,028,237.37 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 11 |
| Date: | |

| Well Location | | | |
|---|---|---|---|
| Well Name | X Coordinate (L) | Y Coordinate (L) | |
| EPA-PZ-2012-1B | 630,192.91 | 3,028,057.05 | 1 |
| SHM-10-06 | 630,215.62 | 3,027,882.54 | 1 |
| SHM-10-06A | 630,300.71 | 3,027,895.73 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

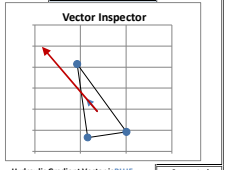
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 30 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-1B | SHM-10-06 | SHM-10-06A |
| Maximum = | 213.71 | 215.04 | 215.13 |
| Minimum = | 210.90 | 212.04 | 212.35 |
| Average = | 212.36 | 213.54 | 213.73 |
| Range = | 2.81 | 3.00 | 2.78 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.007806 | 1.301039 |
| Minimum = | 0.005972 | 0.995293 |
| Average = | 0.007308 | 1.217984 |

10/22/19 12:00 AM

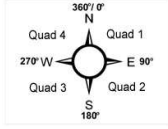



| | | Suggested Scaling Factors |
|---|---|---|
| Hydraulic Gradient Vector is BLUE | | |
| Groundwater Velocity Vector is RED | | |
| Hyd. Grad. Scale Factor = | 5,000.00 | 12,427.46 |
| Velocity Scale Factor = | 150.00 | 74.56 |

| Number of Measurements | |
|---|---|
| Date/Time | 9 |
| EPA-PZ-2012-1B | 9 |
| SHM-10-06 | 9 |
| SHM-10-06A | 9 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,236.41 | 3,027,945.11 | 630,212.27 | 3,027,975.77 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,236.41 | 3,027,945.11 | 630,115.69 | 3,028,098.44 |

| | Number of Vectors | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 1 | 1 |
| 90 -180 | 0 | 0 |
| 180 -270 | 0 | 0 |
| 270 - 360 | 8 | 8 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 630,236.41 | 3,027,945.11 | |
| Triangle Area | 7,574.31 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 175.98 | (L) | EPA-PZ-2012-1B 26.34 |
| Distance #2 - #3 | 86.11 | (L) | SHM-10-06 88.60 |
| Distance #1 - #3 | 194.02 | (L) | SHM-10-06A 65.06 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,192.91 | 3,028,057.05 | 630,215.62 | 3,027,882.54 |
| Nodes #2-#3 | 630,215.62 | 3,027,882.54 | 630,300.71 | 3,027,895.73 |
| Nodes #1-#3 | 630,192.91 | 3,028,057.05 | 630,300.71 | 3,027,895.73 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-1B | SHM-10-06 | SHM-10-06A | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 211.02 | 212.21 | 212.51 | 0.007684 | 324.23 | 1.280712 | 324.23 | 0.00 |
| 10/20/16 0:00 | 210.90 | 212.04 | 212.35 | 0.007490 | 322.46 | 1.248284 | 322.46 | 0.00 |
| 3/2/17 0:00 | 213.18 | 214.29 | 214.50 | 0.006820 | 330.24 | 1.136636 | 330.24 | 0.00 |
| 11/2/17 0:00 | 213.18 | 214.31 | 214.52 | 0.006926 | 330.57 | 1.154350 | 330.57 | 0.00 |
| 5/22/18 0:00 | 212.81 | 214.13 | 214.30 | 0.007805 | 336.54 | 1.300831 | 336.54 | 0.00 |
| 11/1/18 0:00 | 213.10 | 214.36 | 214.56 | 0.007583 | 333.35 | 1.263848 | 333.35 | 0.00 |
| 5/13/19 0:00 | 213.71 | 215.04 | 215.13 | 0.007685 | 343.37 | 1.280862 | 343.37 | 0.00 |
| 10/22/19 0:00 | 211.73 | 212.91 | 213.24 | 0.007806 | 321.79 | 1.301039 | 321.79 | 0.00 |
| 11/4/20 0:00 | 211.60 | 212.60 | 212.43 | 0.005972 | 10.49 | 0.995293 | 10.49 | 0.00 |

| Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 0.004492097 | -0.006234507 | 16258.576 | -0.004492 | 0.006235 | 4 | -0.748683 | 1.039085 | 4 | 630,236.41 | 3,027,945.11 | 630,213.95 | 3,027,976.28 | 630,236.41 | 3,027,945.11 | 630,124.11 | 3,028,100.97 |
| 0.004563761 | -0.005938665 | 15317.467 | -0.004564 | 0.005939 | 4 | -0.760627 | 0.989778 | 4 | 630,236.41 | 3,027,945.11 | 630,213.59 | 3,027,974.80 | 630,236.41 | 3,027,945.11 | 630,122.32 | 3,028,093.57 |
| 0.003385653 | -0.005920069 | 16005.872 | -0.003386 | 0.005920 | 4 | -0.564275 | 0.986678 | 4 | 630,236.41 | 3,027,945.11 | 630,219.49 | 3,027,974.71 | 630,236.41 | 3,027,945.11 | 630,151.77 | 3,028,093.11 |
| 0.003403067 | -0.006032409 | 16335.07 | -0.003403 | 0.006032 | 4 | -0.567178 | 1.005402 | 4 | 630,236.41 | 3,027,945.11 | 630,219.40 | 3,027,975.27 | 630,236.41 | 3,027,945.11 | 630,151.34 | 3,028,095.92 |
| 0.003107705 | -0.007159608 | 19934.057 | -0.003108 | 0.007160 | 4 | -0.517951 | 1.193268 | 4 | 630,236.41 | 3,027,945.11 | 630,220.87 | 3,027,980.90 | 630,236.41 | 3,027,945.11 | 630,158.72 | 3,028,124.10 |
| 0.003401059 | -0.006777613 | 18592.774 | -0.003401 | 0.006778 | 4 | -0.566843 | 1.129602 | 4 | 630,236.41 | 3,027,945.11 | 630,219.41 | 3,027,978.99 | 630,236.41 | 3,027,945.11 | 630,151.39 | 3,028,114.55 |
| 0.002199176 | -0.007363794 | 21125.789 | -0.002199 | 0.007364 | 4 | -0.366529 | 1.227299 | 4 | 630,236.41 | 3,027,945.11 | 630,225.42 | 3,027,981.93 | 630,236.41 | 3,027,945.11 | 630,181.43 | 3,028,129.20 |
| 0.004828986 | -0.006133363 | 15740.71 | -0.004829 | 0.006133 | 4 | -0.804831 | 1.022227 | 4 | 630,236.41 | 3,027,945.11 | 630,212.27 | 3,027,975.77 | 630,236.41 | 3,027,945.11 | 630,115.69 | 3,028,098.44 |
| -0.001087676 | -0.005871871 | 18677.405 | 0.001088 | 0.005872 | 1 | 0.181279 | 0.978645 | 1 | 630,236.41 | 3,027,945.11 | 630,241.85 | 3,027,974.47 | 630,236.41 | 3,027,945.11 | 630,263.61 | 3,028,091.90 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 12 |
| Date: | |

| Well Name | Well Location X Coordinate (L) | Y Coordinate (L) | |
|---|---|---|---|
| EPA-PZ-2012-1B | 630,192.91 | 3,028,057.05 | 1 |
| EPA-PZ-2012-2B | 630,290.40 | 3,028,124.72 | 1 |
| SHM-10-06A | 630,300.71 | 3,027,895.73 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

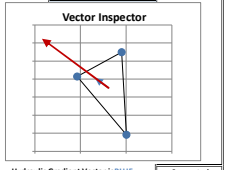
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 30 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-1B | EPA-PZ-2012-2B | SHM-10-06A |
| Maximum = | 213.71 | 213.60 | 215.13 |
| Minimum = | 210.90 | 211.15 | 212.35 |
| Average = | 212.36 | 212.47 | 213.73 |
| Range = | 2.81 | 2.45 | 2.78 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.007993 | 1.332212 |
| Minimum = | 0.004841 | 0.806890 |
| Average = | 0.007219 | 1.203194 |

10/22/19 12:00 AM

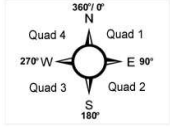



| | | Suggested Scaling Factors |
|---|---|---|
| Hydraulic Gradient Vector is BLUE | | |
| Groundwater Velocity Vector is RED | | |
| Hyd. Grad. Scale Factor = | 5,000.00 | 14,338.44 |
| Velocity Scale Factor = | 150.00 | 86.03 |

| Number of Measurements | |
|---|---|
| Date/Time | 9 |
| EPA-PZ-2012-1B | 9 |
| EPA-PZ-2012-2B | 9 |
| SHM-10-06A | 9 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,261.34 | 3,028,025.83 | 630,232.14 | 3,028,053.12 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,261.34 | 3,028,025.83 | 630,115.34 | 3,028,162.28 |

| Number of Vectors | | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 0 | 0 |
| 270 - 360 | 9 | 9 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 630,261.34 | 3,028,025.83 | |
| Triangle Area | 11,510.95 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 118.67 | (L) | EPA-PZ-2012-1B 91.01 |
| Distance #2 - #3 | 229.22 | (L) | EPA-PZ-2012-2B 57.81 |
| Distance #1 - #3 | 194.02 | (L) | SHM-10-06A 31.17 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,192.91 | 3,028,057.05 | 630,290.40 | 3,028,124.72 |
| Nodes #2-#3 | 630,290.40 | 3,028,124.72 | 630,300.71 | 3,027,895.73 |
| Nodes #1-#3 | 630,192.91 | 3,028,057.05 | 630,300.71 | 3,027,895.73 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-1B | EPA-PZ-2012-2B | SHM-10-06A | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 211.02 | 211.25 | 212.51 | 0.007955 | 311.13 | 1.325779 | 311.13 | 0.00 |
| 10/20/16 0:00 | 210.90 | 211.15 | 212.35 | 0.007802 | 309.57 | 1.300258 | 309.57 | 0.00 |
| 3/2/17 0:00 | 213.18 | 213.24 | 214.50 | 0.006832 | 320.99 | 1.138674 | 320.99 | 0.00 |
| 11/2/17 0:00 | 213.18 | 213.26 | 214.52 | 0.006952 | 319.67 | 1.158691 | 319.67 | 0.00 |
| 5/22/18 0:00 | 212.81 | 212.84 | 214.30 | 0.007689 | 323.35 | 1.281553 | 323.35 | 0.00 |
| 11/1/18 0:00 | 213.10 | 213.08 | 214.56 | 0.007525 | 326.52 | 1.254159 | 326.52 | 0.00 |
| 5/13/19 0:00 | 213.71 | 213.60 | 215.13 | 0.007383 | 332.12 | 1.230531 | 332.12 | 0.00 |
| 10/22/19 0:00 | 211.73 | 211.93 | 213.24 | 0.007993 | 313.06 | 1.332212 | 313.06 | 0.00 |
| 11/4/20 0:00 | 211.60 | 211.86 | 212.43 | 0.004841 | 298.33 | 0.806890 | 298.33 | 0.00 |

| Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 0.005991323 | -0.00523267 | 12280.155 | -0.005991 | 0.005233 | 4 | -0.998554 | 0.872112 | 4 | 630,261.34 | 3,028,025.83 | 630,231.38 | 3,028,052.00 | 630,261.34 | 3,028,025.83 | 630,111.56 | 3,028,156.65 |
| 0.006013893 | -0.004969634 | 11469.322 | -0.006014 | 0.004970 | 4 | -1.002316 | 0.828272 | 4 | 630,261.34 | 3,028,025.83 | 630,231.27 | 3,028,050.68 | 630,261.34 | 3,028,025.83 | 630,110.99 | 3,028,150.07 |
| 0.004300399 | -0.005308802 | 13578.456 | -0.004300 | 0.005309 | 4 | -0.716733 | 0.884800 | 4 | 630,261.34 | 3,028,025.83 | 630,239.84 | 3,028,052.38 | 630,261.34 | 3,028,025.83 | 630,153.83 | 3,028,158.55 |
| 0.004499331 | -0.005299846 | 13425.969 | -0.004499 | 0.005300 | 4 | -0.749888 | 0.883308 | 4 | 630,261.34 | 3,028,025.83 | 630,238.84 | 3,028,052.33 | 630,261.34 | 3,028,025.83 | 630,148.86 | 3,028,158.33 |
| 0.004589873 | -0.00616917 | 16000.902 | -0.004590 | 0.006169 | 4 | -0.764979 | 1.028195 | 4 | 630,261.34 | 3,028,025.83 | 630,238.39 | 3,028,056.68 | 630,261.34 | 3,028,025.83 | 630,146.59 | 3,028,180.06 |
| 0.00415133 | -0.006276255 | 16601.818 | -0.004151 | 0.006276 | 4 | -0.691888 | 1.046042 | 4 | 630,261.34 | 3,028,025.83 | 630,240.58 | 3,028,057.21 | 630,261.34 | 3,028,025.83 | 630,157.56 | 3,028,182.74 |
| 0.003452836 | -0.006526054 | 17799.015 | -0.003453 | 0.006526 | 4 | -0.575473 | 1.087676 | 4 | 630,261.34 | 3,028,025.83 | 630,244.08 | 3,028,058.46 | 630,261.34 | 3,028,025.83 | 630,175.02 | 3,028,188.98 |
| 0.005839893 | -0.005457838 | 13058.117 | -0.005840 | 0.005458 | 4 | -0.973315 | 0.909640 | 4 | 630,261.34 | 3,028,025.83 | 630,232.14 | 3,028,053.12 | 630,261.34 | 3,028,025.83 | 630,115.34 | 3,028,162.28 |
| 0.004261559 | -0.002297319 | 4482.4103 | -0.004262 | 0.002297 | 4 | -0.710260 | 0.382887 | 4 | 630,261.34 | 3,028,025.83 | 630,240.03 | 3,028,037.32 | 630,261.34 | 3,028,025.83 | 630,154.80 | 3,028,083.27 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 13 |
| Date: | |

| Well Name | Well Location X Coordinate (L) | Y Coordinate (L) | |
|---|---|---|---|
| EPA-PZ-2012-3B | 630,064.63 | 3,028,086.13 | 1 |
| EPA-PZ-2012-4B | 629,989.87 | 3,028,043.80 | 1 |
| SHP-2016-5B | 629,963.58 | 3,028,113.45 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

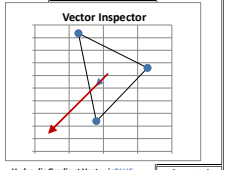
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 31 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-3B | EPA-PZ-2012-4B | SHP-2016-5B |
| Maximum = | 213.14 | 212.93 | 213.02 |
| Minimum = | 210.20 | 209.82 | 209.94 |
| Average = | 211.80 | 211.48 | 211.56 |
| Range = | 2.94 | 3.11 | 3.08 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.004812 | 0.801995 |
| Minimum = | 0.002100 | 0.349921 |
| Average = | 0.003923 | 0.653858 |

10/22/19 12:00 AM

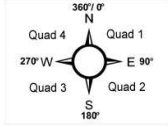



| | | Suggested Scaling Factors |
|---|---|---|
| Hydraulic Gradient Vector is BLUE | | |
| Groundwater Velocity Vector is RED | | |
| Hyd. Grad. Scale Factor = | 5,000.00 | 10,876.84 |
| Velocity Scale Factor = | 150.00 | 65.26 |

| Number of Measurements | |
|---|---|
| Date/Time | 10 |
| EPA-PZ-2012-3B | 10 |
| EPA-PZ-2012-4B | 10 |
| SHP-2016-5B | 10 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,006.03 | 3,028,081.13 | 629,988.63 | 3,028,071.69 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,006.03 | 3,028,081.13 | 629,919.05 | 3,028,033.94 |

| Orientation (deg) | Number of Vectors i-vector | V-vector |
|---|---|---|
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 10 | 10 |
| 270 - 360 | 0 | 0 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 630,006.03 | 3,028,081.13 | |
| Triangle Area | 3,159.94 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 85.91 | (L) | EPA-PZ-2012-3B 44.65 |
| Distance #2 - #3 | 74.45 | (L) | EPA-PZ-2012-4B 81.16 |
| Distance #1 - #3 | 104.68 | (L) | SHP-2016-5B 54.19 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,064.63 | 3,028,086.13 | 629,989.87 | 3,028,043.80 |
| Nodes #2-#3 | 629,989.87 | 3,028,043.80 | 629,963.58 | 3,028,113.45 |
| Nodes #1-#3 | 630,064.63 | 3,028,086.13 | 629,963.58 | 3,028,113.45 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-3B | EPA-PZ-2012-4B | SHP-2016-5B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 210.30 | 209.90 | 210.00 | 0.004699 | 232.71 | 0.783178 | 232.71 | 0.00 |
| 10/20/16 0:00 | 210.20 | 209.82 | 209.94 | 0.004523 | 228.44 | 0.753770 | 228.44 | 0.00 |
| 3/2/17 0:00 | 212.60 | 212.32 | 212.36 | 0.003259 | 241.03 | 0.543216 | 241.03 | 0.00 |
| 11/2/17 0:00 | 212.46 | 212.08 | 212.25 | 0.004712 | 220.33 | 0.785255 | 220.33 | 0.00 |
| 5/22/18 0:00 | 212.21 | 211.83 | 212.02 | 0.004812 | 217.29 | 0.801995 | 217.29 | 0.00 |
| 11/1/18 0:00 | 212.37 | 212.21 | 212.16 | 0.002100 | 267.98 | 0.349921 | 267.98 | 0.00 |
| 5/13/19 0:00 | 213.14 | 212.93 | 213.02 | 0.002534 | 220.82 | 0.422305 | 220.82 | 0.00 |
| 10/22/19 0:00 | 210.97 | 210.63 | 210.67 | 0.003958 | 241.52 | 0.659697 | 241.52 | 0.00 |
| 5/18/20 0:00 | 212.89 | 212.54 | 212.66 | 0.004194 | 226.72 | 0.699054 | 226.72 | 0.00 |
| 11/4/20 0:00 | 210.87 | 210.49 | 210.57 | 0.004441 | 235.32 | 0.740191 | 235.32 | 0.00 |

| | Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 8/16/16 0:00 | 0.003738512 | 0.002846891 | -10765.83 | -0.003739 | -0.002847 | 3 | -0.623085 | -0.474482 | 3 | 630,006.03 | 3,028,081.13 | 629,987.33 | 3,028,066.89 | 630,006.03 | 3,028,081.13 | 629,912.56 | 3,028,009.95 |
| 10/20/16 0:00 | 0.003384138 | 0.00300028 | -11007.13 | -0.003384 | -0.003000 | 3 | -0.564023 | -0.500047 | 3 | 630,006.03 | 3,028,081.13 | 629,989.11 | 3,028,066.13 | 630,006.03 | 3,028,081.13 | 629,921.42 | 3,028,006.12 |
| 3/2/17 0:00 | 0.002851385 | 0.001578796 | -6364.688 | -0.002851 | -0.001579 | 3 | -0.475231 | -0.263133 | 3 | 630,006.03 | 3,028,081.13 | 629,991.77 | 3,028,073.23 | 630,006.03 | 3,028,081.13 | 629,934.74 | 3,028,041.66 |
| 11/2/17 0:00 | 0.003049242 | 0.003591748 | -12584.88 | -0.003049 | -0.003592 | 3 | -0.508207 | -0.598625 | 3 | 630,006.03 | 3,028,081.13 | 629,990.78 | 3,028,063.17 | 630,006.03 | 3,028,081.13 | 629,929.80 | 3,027,991.33 |
| 5/22/18 0:00 | 0.002915284 | 0.003828335 | -13217.13 | -0.002915 | -0.003828 | 3 | -0.485881 | -0.638056 | 3 | 630,006.03 | 3,028,081.13 | 629,991.45 | 3,028,061.99 | 630,006.03 | 3,028,081.13 | 629,933.14 | 3,027,985.42 |
| 11/1/18 0:00 | 0.002098217 | 7.41146E-05 | -1334.068 | -0.002098 | -0.000074 | 3 | -0.349703 | -0.012352 | 3 | 630,006.03 | 3,028,081.13 | 629,995.54 | 3,028,080.76 | 630,006.03 | 3,028,081.13 | 629,953.57 | 3,028,079.27 |
| 5/13/19 0:00 | 0.001656443 | 0.001917419 | -6636.641 | -0.001656 | -0.001917 | 3 | -0.276074 | -0.319570 | 3 | 630,006.03 | 3,028,081.13 | 629,997.74 | 3,028,071.54 | 630,006.03 | 3,028,081.13 | 629,964.62 | 3,028,033.19 |
| 10/22/19 0:00 | 0.003479141 | 0.001887536 | -7696.736 | -0.003479 | -0.001888 | 3 | -0.579857 | -0.314589 | 3 | 630,006.03 | 3,028,081.13 | 629,988.63 | 3,028,071.69 | 630,006.03 | 3,028,081.13 | 629,919.05 | 3,028,033.94 |
| 5/18/20 0:00 | 0.003053515 | 0.002875483 | -10418.23 | -0.003054 | -0.002875 | 3 | -0.508919 | -0.479247 | 3 | 630,006.03 | 3,028,081.13 | 629,990.76 | 3,028,066.75 | 630,006.03 | 3,028,081.13 | 629,929.69 | 3,028,009.24 |
| 11/4/20 0:00 | 0.003652055 | 0.002527106 | -9742.455 | -0.003652 | -0.002527 | 3 | -0.608676 | -0.421184 | 3 | 630,006.03 | 3,028,081.13 | 629,987.77 | 3,028,068.49 | 630,006.03 | 3,028,081.13 | 629,914.73 | 3,028,017.95 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 14 |
| Date: | |

| Well Location | | | |
|---|---|---|---|
| Well Name | X Coordinate (L) | Y Coordinate (L) | |
| SHP-2016-2B | 629,925.84 | 3,028,200.30 | 1 |
| SHP-2016-3B | 630,007.26 | 3,028,174.29 | 1 |
| SHP-2016-4B | 629,902.15 | 3,028,146.65 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

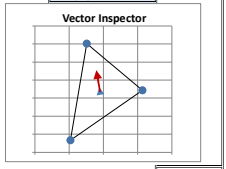
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 30 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | SHP-2016-2B | SHP-2016-3B | SHP-2016-4B |
| Maximum = | #REF! | #REF! | #REF! |
| Minimum = | #REF! | #REF! | #REF! |
| Average = | #REF! | #REF! | #REF! |
| Range = | #REF! | #REF! | #REF! |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | #REF! | #REF! |
| Minimum = | #REF! | #REF! |
| Average = | #REF! | #REF! |

5/18/20 12:00 AM




Hydraulic Gradient Vector is BLUE

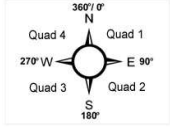
Groundwater Velocity Vector is RED

| | | Suggested Scaling Factors |
|---|---|---|
| Hyd. Grad. Scale Factor = | 5,000.00 | #REF! |
| Velocity Scale Factor = | 150.00 | #REF! |

| Number of Measurements | |
|---|---|
| Date/Time | 9 |
| SHP-2016-2B | 9 |
| SHP-2016-3B | 9 |
| SHP-2016-4B | 9 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,945.08 | 3,028,173.75 | 629,943.99 | 3,028,176.09 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,945.08 | 3,028,173.75 | 629,939.62 | 3,028,185.48 |

| | Number of Vectors | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 1 | 1 |
| 90 -180 | 1 | 1 |
| 180 -270 | 3 | 3 |
| 270 - 360 | 4 | 4 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 629,945.08 | 3,028,173.75 | |
| Triangle Area | 2,492.19 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 85.47 | (L) | SHP-2016-2B 96.11 |
| Distance #2 - #3 | 108.68 | (L) | SHP-2016-3B 32.45 |
| Distance #1 - #3 | 58.65 | (L) | SHP-2016-4B 51.44 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 629,925.84 | 3,028,200.30 | 630,007.26 | 3,028,174.29 |
| Nodes #2-#3 | 630,007.26 | 3,028,174.29 | 629,902.15 | 3,028,146.65 |
| Nodes #1-#3 | 629,925.84 | 3,028,200.30 | 629,902.15 | 3,028,146.65 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | SHP-2016-2B | SHP-2016-3B | SHP-2016-4B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 10/20/16 0:00 | 209.99 | 210.05 | 209.97 | 0.000751 | 266.83 | 0.125223 | 266.83 | 0.00 |
| 3/2/17 0:00 | 212.36 | 212.40 | 212.37 | 0.000487 | 303.90 | 0.081216 | 303.90 | 0.00 |
| 11/2/17 0:00 | 212.26 | 212.32 | 212.23 | 0.000828 | 255.68 | 0.138019 | 255.68 | 0.00 |
| 5/22/18 0:00 | 211.98 | 212.03 | 212.01 | 0.000764 | 327.74 | 0.127321 | 327.74 | 0.00 |
| 11/1/18 0:00 | 212.73 | 212.23 | 212.19 | 0.011487 | 167.10 | 1.914526 | 167.10 | 0.00 |
| 5/13/19 0:00 | 212.95 | 212.97 | 213.01 | 0.001080 | 5.20 | 0.179933 | 5.20 | 0.00 |
| 10/22/19 0:00 | 209.66 | 210.81 | 210.65 | 0.022808 | 341.57 | 3.801300 | 341.57 | 0.00 |
| 5/18/20 0:00 | 212.60 | 212.63 | 212.62 | 0.000518 | 335.03 | 0.086280 | 335.03 | 0.00 |
| 11/4/20 0:00 | 210.65 | 210.71 | 210.58 | 0.001326 | 229.67 | 0.221044 | 229.67 | 0.00 |

| | Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 10/20/16 0:00 | 0.000750187 | 4.15261E-05 | -388.3216 | -0.000750 | -0.000042 | 3 | -0.125031 | -0.006921 | 3 | 629,945.08 | 3,028,173.75 | 629,941.33 | 3,028,173.54 | 629,945.08 | 3,028,173.75 | 629,926.33 | 3,028,172.71 |
| 3/2/17 0:00 | 0.000404455 | -0.000271791 | 780.62157 | -0.000404 | 0.000272 | 4 | -0.067409 | 0.045299 | 4 | 629,945.08 | 3,028,173.75 | 629,943.06 | 3,028,175.11 | 629,945.08 | 3,028,173.75 | 629,934.97 | 3,028,180.54 |
| 11/2/17 0:00 | 0.000802371 | 0.000204876 | -913.5804 | -0.000802 | -0.000205 | 3 | -0.133728 | -0.034146 | 3 | 629,945.08 | 3,028,173.75 | 629,941.07 | 3,028,172.72 | 629,945.08 | 3,028,173.75 | 629,925.02 | 3,028,168.62 |
| 5/22/18 0:00 | 0.000407726 | -0.000646021 | 1911.4233 | -0.000408 | 0.000646 | 4 | -0.067954 | 0.107670 | 4 | 629,945.08 | 3,028,173.75 | 629,943.04 | 3,028,176.98 | 629,945.08 | 3,028,173.75 | 629,934.89 | 3,028,189.90 |
| 11/1/18 0:00 | -0.002563938 | 0.011197363 | -32080.04 | 0.002564 | -0.011197 | 2 | 0.427323 | -1.866227 | 2 | 629,945.08 | 3,028,173.75 | 629,957.90 | 3,028,117.76 | 629,945.08 | 3,028,173.75 | 630,009.18 | 3,027,893.81 |
| 5/13/19 0:00 | -9.78266E-05 | -0.001075159 | 3530.371 | 0.000098 | 0.001075 | 1 | 0.016304 | 0.179193 | 1 | 629,945.08 | 3,028,173.75 | 629,945.57 | 3,028,179.12 | 629,945.08 | 3,028,173.75 | 629,947.53 | 3,028,200.63 |
| 10/22/19 0:00 | 0.007212077 | -0.02163751 | 61189.299 | -0.007212 | 0.021638 | 4 | -1.202013 | 3.606252 | 4 | 629,945.08 | 3,028,173.75 | 629,909.02 | 3,028,281.93 | 629,945.08 | 3,028,173.75 | 629,764.78 | 3,028,714.68 |
| 5/18/20 0:00 | 0.000218544 | -0.000469288 | 1496.0304 | -0.000219 | 0.000469 | 4 | -0.036424 | 0.078215 | 4 | 629,945.08 | 3,028,173.75 | 629,943.99 | 3,028,176.09 | 629,945.08 | 3,028,173.75 | 629,939.62 | 3,028,185.48 |
| 11/4/20 0:00 | 0.001011104 | 0.000858277 | -3025.305 | -0.001011 | -0.000858 | 3 | -0.168517 | -0.143046 | 3 | 629,945.08 | 3,028,173.75 | 629,940.03 | 3,028,169.46 | 629,945.08 | 3,028,173.75 | 629,919.81 | 3,028,152.29 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 15 |
| Date: | |

| Well Name | Well Location X Coordinate (L) | Y Coordinate (L) | |
|---|---|---|---|
| EPA-PZ-2012-3B | 630,064.63 | 3,028,086.13 | 1 |
| SHP-2016-3B | 630,007.26 | 3,028,174.29 | 1 |
| SHP-2016-5B | 629,963.58 | 3,028,113.45 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

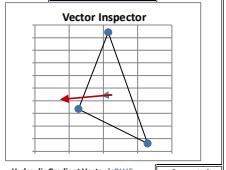
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 31 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-3B | SHP-2016-3B | SHP-2016-5B |
| Maximum = | 213.14 | 212.97 | 213.02 |
| Minimum = | 210.20 | 210.05 | 209.94 |
| Average = | 211.80 | 211.63 | 211.56 |
| Range = | 2.94 | 2.92 | 3.08 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.003011 | 0.501765 |
| Minimum = | 0.001572 | 0.262042 |
| Average = | 0.002388 | 0.398039 |

10/22/19 12:00 AM

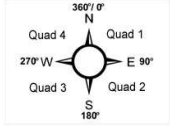



| | | Suggested Scaling Factors |
|---|---|---|
| Hydraulic Gradient Vector is BLUE | | |
| Groundwater Velocity Vector is RED | | |
| Hyd. Grad. Scale Factor = | 5,000.00 | 17,468.84 |
| Velocity Scale Factor = | 150.00 | 104.81 |

| Number of Measurements | |
|---|---|
| Date/Time | 10 |
| EPA-PZ-2012-3B | 10 |
| SHP-2016-3B | 10 |
| SHP-2016-5B | 10 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,011.82 | 3,028,124.62 | 629,996.79 | 3,028,123.91 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 630,011.82 | 3,028,124.62 | 629,936.64 | 3,028,121.07 |

| | Number of Vectors | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 2 | 2 |
| 270 - 360 | 8 | 8 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 630,011.82 | 3,028,124.62 | |
| Triangle Area | 3,670.61 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 105.18 | (L) | EPA-PZ-2012-3B 41.82 |
| Distance #2 - #3 | 74.90 | (L) | SHP-2016-3B 68.73 |
| Distance #1 - #3 | 104.68 | (L) | SHP-2016-5B 69.45 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,064.63 | 3,028,086.13 | 630,007.26 | 3,028,174.29 |
| Nodes #2-#3 | 630,007.26 | 3,028,174.29 | 629,963.58 | 3,028,113.45 |
| Nodes #1-#3 | 630,064.63 | 3,028,086.13 | 629,963.58 | 3,028,113.45 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-3B | SHP-2016-3B | SHP-2016-5B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 210.30 | 210.11 | 210.00 | 0.002908 | 275.34 | 0.484706 | 275.34 | 0.00 |
| 10/20/16 0:00 | 210.20 | 210.05 | 209.94 | 0.002564 | 270.73 | 0.427385 | 270.73 | 0.00 |
| 3/2/17 0:00 | 212.60 | 212.40 | 212.36 | 0.002352 | 290.88 | 0.392057 | 290.88 | 0.00 |
| 11/2/17 0:00 | 212.46 | 212.32 | 212.25 | 0.002021 | 278.13 | 0.336866 | 278.13 | 0.00 |
| 5/22/18 0:00 | 212.21 | 212.03 | 212.02 | 0.001893 | 301.63 | 0.315513 | 301.63 | 0.00 |
| 11/1/18 0:00 | 212.37 | 212.23 | 212.16 | 0.002021 | 278.13 | 0.336866 | 278.13 | 0.00 |
| 5/13/19 0:00 | 213.14 | 212.97 | 213.02 | 0.001572 | 330.80 | 0.262042 | 330.80 | 0.00 |
| 10/22/19 0:00 | 210.97 | 210.81 | 210.67 | 0.003011 | 267.30 | 0.501765 | 267.30 | 0.00 |
| 5/18/20 0:00 | 212.89 | 212.63 | 212.66 | 0.002529 | 314.79 | 0.421428 | 314.79 | 0.00 |
| 11/4/20 0:00 | 210.87 | 210.71 | 210.57 | 0.003011 | 267.30 | 0.501765 | 267.30 | 0.00 |

| Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 0.002895595 | -0.000270869 | -793.8975 | -0.002896 | 0.000271 | 4 | -0.482599 | 0.045145 | 4 | 630,011.82 | 3,028,124.62 | 629,997.35 | 3,028,125.98 | 630,011.82 | 3,028,124.62 | 629,939.43 | 3,028,131.40 |
| 0.002564097 | -3.28704E-05 | -1305.813 | -0.002564 | 0.000033 | 4 | -0.427349 | 0.005478 | 4 | 630,011.82 | 3,028,124.62 | 629,999.00 | 3,028,124.79 | 630,011.82 | 3,028,124.62 | 629,947.72 | 3,028,125.45 |
| 0.002197892 | -0.000838329 | 1366.3173 | -0.002198 | 0.000838 | 4 | -0.366315 | 0.139721 | 4 | 630,011.82 | 3,028,124.62 | 630,000.83 | 3,028,128.82 | 630,011.82 | 3,028,124.62 | 629,956.88 | 3,028,145.58 |
| 0.002000867 | -0.000285961 | -182.2994 | -0.002001 | 0.000286 | 4 | -0.333478 | 0.047660 | 4 | 630,011.82 | 3,028,124.62 | 630,001.82 | 3,028,126.05 | 630,011.82 | 3,028,124.62 | 629,961.80 | 3,028,131.77 |
| 0.001611832 | -0.000992846 | 2203.0758 | -0.001612 | 0.000993 | 4 | -0.268639 | 0.165474 | 4 | 630,011.82 | 3,028,124.62 | 630,003.76 | 3,028,129.59 | 630,011.82 | 3,028,124.62 | 629,971.53 | 3,028,149.44 |
| 0.002000867 | -0.000285961 | -182.3894 | -0.002001 | 0.000286 | 4 | -0.333478 | 0.047660 | 4 | 630,011.82 | 3,028,124.62 | 630,001.82 | 3,028,126.05 | 630,011.82 | 3,028,124.62 | 629,961.80 | 3,028,131.77 |
| 0.000766987 | -0.001372483 | 3885.8805 | -0.000767 | 0.001372 | 4 | -0.127831 | 0.228747 | 4 | 630,011.82 | 3,028,124.62 | 630,007.99 | 3,028,131.49 | 630,011.82 | 3,028,124.62 | 629,992.65 | 3,028,158.94 |
| 0.003007238 | 0.000142073 | -2113.994 | -0.003007 | -0.000142 | 3 | -0.501206 | -0.023679 | 3 | 630,011.82 | 3,028,124.62 | 629,996.79 | 3,028,123.91 | 630,011.82 | 3,028,124.62 | 629,936.64 | 3,028,121.07 |
| 0.001794473 | -0.001781434 | 4476.5927 | -0.001794 | 0.001781 | 4 | -0.299079 | 0.296906 | 4 | 630,011.82 | 3,028,124.62 | 630,002.85 | 3,028,133.53 | 630,011.82 | 3,028,124.62 | 629,966.96 | 3,028,169.16 |
| 0.003007238 | 0.000142073 | -2114.094 | -0.003007 | -0.000142 | 3 | -0.501206 | -0.023679 | 3 | 630,011.82 | 3,028,124.62 | 629,996.79 | 3,028,123.91 | 630,011.82 | 3,028,124.62 | 629,936.64 | 3,028,121.07 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 16 |
| Date: | |

| Well Name | Well Location X Coordinate (L) | Y Coordinate (L) | |
|---|---|---|---|
| EPA-PZ-2012-4B | 629,989.87 | 3,028,043.80 | 1 |
| EPA-PZ-2012-6B | 629,894.40 | 3,028,069.24 | 1 |
| SHP-2016-1B | 629,933.53 | 3,027,979.56 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

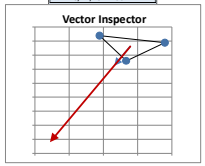
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 31 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-4B | EPA-PZ-2012-6B | SHP-2016-1B |
| Maximum = | 212.93 | 212.96 | 211.83 |
| Minimum = | 209.82 | 209.83 | 208.78 |
| Average = | 211.48 | 211.50 | 210.32 |
| Range = | 3.11 | 3.13 | 3.05 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.021154 | 3.525694 |
| Minimum = | 0.009350 | 1.558303 |
| Average = | 0.015205 | 2.534161 |

10/22/19 12:00 AM

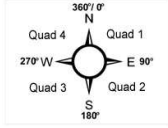



| | | Suggested Scaling Factors |
|---|---|---|
| Hydraulic Gradient Vector is BLUE | | |
| Groundwater Velocity Vector is RED | | |
| Hyd. Grad. Scale Factor = | 5,000.00 | 2,335.27 |
| Velocity Scale Factor = | 150.00 | 14.01 |

| Number of Measurements | |
|---|---|
| Date/Time | 10 |
| EPA-PZ-2012-4B | 10 |
| EPA-PZ-2012-6B | 10 |
| SHP-2016-1B | 10 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,939.27 | 3,028,030.87 | 629,915.86 | 3,027,962.67 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,939.27 | 3,028,030.87 | 629,822.22 | 3,027,689.87 |

| | Number of Vectors | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 10 | 10 |
| 270 - 360 | 0 | 0 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 629,939.27 | 3,028,030.87 | |
| Triangle Area | 3,783.14 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 98.80 | (L) | EPA-PZ-2012-4B 63.67 |
| Distance #2 - #3 | 97.85 | (L) | EPA-PZ-2012-6B 51.51 |
| Distance #1 - #3 | 85.45 | (L) | SHP-2016-1B 64.82 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 629,989.87 | 3,028,043.80 | 629,894.40 | 3,028,069.24 |
| Nodes #2-#3 | 629,894.40 | 3,028,069.24 | 629,933.53 | 3,027,979.56 |
| Nodes #1-#3 | 629,989.87 | 3,028,043.80 | 629,933.53 | 3,027,979.56 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-4B | EPA-PZ-2012-6B | SHP-2016-1B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 209.90 | 209.94 | 209.20 | 0.009350 | 192.44 | 1.558303 | 192.44 | 0.00 |
| 10/20/16 0:00 | 209.82 | 209.83 | 208.78 | 0.013631 | 194.50 | 2.271819 | 194.50 | 0.00 |
| 3/2/17 0:00 | 212.32 | 212.33 | 211.16 | 0.015198 | 194.54 | 2.532975 | 194.54 | 0.00 |
| 11/2/17 0:00 | 212.08 | 212.16 | 211.23 | 0.011529 | 190.89 | 1.921432 | 190.89 | 0.00 |
| 5/22/18 0:00 | 211.83 | 211.92 | 210.65 | 0.015858 | 191.81 | 2.642951 | 191.81 | 0.00 |
| 11/1/18 0:00 | 212.21 | 212.21 | 210.59 | 0.021154 | 194.92 | 3.525694 | 194.92 | 0.00 |
| 5/13/19 0:00 | 212.93 | 212.96 | 211.83 | 0.014517 | 193.72 | 2.419564 | 193.72 | 0.00 |
| 10/22/19 0:00 | 210.63 | 210.53 | 209.49 | 0.014421 | 198.95 | 2.403488 | 198.95 | 0.00 |
| 5/18/20 0:00 | 212.54 | 212.69 | 211.05 | 0.020265 | 190.62 | 3.377484 | 190.62 | 0.00 |
| 11/4/20 0:00 | 210.49 | 210.45 | 209.24 | 0.016127 | 196.36 | 2.687897 | 196.36 | 0.00 |

| Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 0.002013982 | 0.00913033 | -28705.93 | -0.002014 | -0.009130 | 3 | -0.335664 | -1.521722 | 3 | 629,939.27 | 3,028,030.87 | 629,929.20 | 3,027,985.22 | 629,939.27 | 3,028,030.87 | 629,888.92 | 3,027,802.61 |
| 0.003411866 | 0.013197008 | -41900.74 | -0.003412 | -0.013197 | 3 | -0.568644 | -2.199501 | 3 | 629,939.27 | 3,028,030.87 | 629,922.21 | 3,027,964.88 | 629,939.27 | 3,028,030.87 | 629,853.97 | 3,027,700.94 |
| 0.003815339 | 0.014711148 | -46737.31 | -0.003815 | -0.014711 | 3 | -0.635890 | -2.451858 | 3 | 629,939.27 | 3,028,030.87 | 629,920.19 | 3,027,957.31 | 629,939.27 | 3,028,030.87 | 629,843.88 | 3,027,663.09 |
| 0.002178711 | 0.011320852 | -35440.52 | -0.002179 | -0.011321 | 3 | -0.363119 | -1.886809 | 3 | 629,939.27 | 3,028,030.87 | 629,928.37 | 3,027,974.26 | 629,939.27 | 3,028,030.87 | 629,884.80 | 3,027,747.85 |
| 0.003245811 | 0.015521968 | -48834.2 | -0.003246 | -0.015522 | 3 | -0.540969 | -2.586995 | 3 | 629,939.27 | 3,028,030.87 | 629,923.04 | 3,027,953.26 | 629,939.27 | 3,028,030.87 | 629,858.12 | 3,027,642.82 |
| 0.005446891 | 0.02044089 | -65115.19 | -0.005447 | -0.020441 | 3 | -0.907815 | -3.406815 | 3 | 629,939.27 | 3,028,030.87 | 629,912.03 | 3,027,928.66 | 629,939.27 | 3,028,030.87 | 629,803.09 | 3,027,519.84 |
| 0.003443797 | 0.014103002 | -44661.13 | -0.003444 | -0.014103 | 3 | -0.573966 | -2.350500 | 3 | 629,939.27 | 3,028,030.87 | 629,922.05 | 3,027,960.35 | 629,939.27 | 3,028,030.87 | 629,853.17 | 3,027,678.29 |
| 0.004682029 | 0.013639712 | -44040.65 | -0.004682 | -0.013640 | 3 | -0.780338 | -2.273285 | 3 | 629,939.27 | 3,028,030.87 | 629,915.86 | 3,027,962.67 | 629,939.27 | 3,028,030.87 | 629,822.22 | 3,027,689.87 |
| 0.003736247 | 0.019917498 | -62452.31 | -0.003736 | -0.019917 | 3 | -0.622708 | -3.319583 | 3 | 629,939.27 | 3,028,030.87 | 629,920.59 | 3,027,931.28 | 629,939.27 | 3,028,030.87 | 629,845.86 | 3,027,532.93 |
| 0.00454246 | 0.015474444 | -49508.51 | -0.004542 | -0.015474 | 3 | -0.757077 | -2.579074 | 3 | 629,939.27 | 3,028,030.87 | 629,916.55 | 3,027,953.49 | 629,939.27 | 3,028,030.87 | 629,825.71 | 3,027,644.01 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 17 |
| Date: | |

**Well Location**

| Well Name | X Coordinate (L) | Y Coordinate (L) | |
|---|---|---|---|
| SHP-2016-2B | 629,925.84 | 3,028,200.30 | 1 |
| SHP-2016-3B | 630,007.26 | 3,028,174.29 | 1 |
| SHM-05-42B | 630,017.63 | 3,028,376.14 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

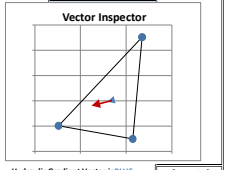
| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 29 | |

**Statistics**

| Head (L) | SHP-2016-2B | SHP-2016-3B | SHM-05-42B |
|---|---|---|---|
| Maximum = | #REF! | #REF! | #REF! |
| Minimum = | #REF! | #REF! | #REF! |
| Average = | #REF! | #REF! | #REF! |
| Range = | #REF! | #REF! | #REF! |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | #REF! | #REF! |
| Minimum = | #REF! | #REF! |
| Average = | #REF! | #REF! |

11/4/20 12:00 AM



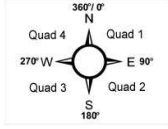

Hydraulic Gradient Vector is BLUE
Groundwater Velocity Vector is RED

| | | Suggested Scaling Factors |
|---|---|---|
| Hyd. Grad. Scale Factor = | 5,000.00 | #REF! |
| Velocity Scale Factor = | 150.00 | #REF! |

| Number of Measurements | |
|---|---|
| Date/Time | 8 |
| SHP-2016-2B | 8 |
| SHP-2016-3B | 8 |
| SHM-05-42B | 8 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,983.58 | 3,028,250.24 | 629,979.25 | 3,028,248.24 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,983.58 | 3,028,250.24 | 629,961.95 | 3,028,240.21 |

| | Number of Vectors | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 2 | 2 |
| 90 -180 | 0 | 0 |
| 180 -270 | 2 | 2 |
| 270 - 360 | 4 | 4 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 629,983.58 | 3,028,250.24 | |
| Triangle Area | 8,352.15 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 85.47 | (L) | SHP-2016-2B 80.15 |
| Distance #2 - #3 | 202.12 | (L) | SHP-2016-3B 75.22 |
| Distance #1 - #3 | 198.36 | (L) | SHM-05-42B 24.62 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 629,925.84 | 3,028,200.30 | 630,007.26 | 3,028,174.29 |
| Nodes #2-#3 | 630,007.26 | 3,028,174.29 | 630,017.63 | 3,028,376.14 |
| Nodes #1-#3 | 629,925.84 | 3,028,200.30 | 630,017.63 | 3,028,376.14 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | SHP-2016-2B | SHP-2016-3B | SHM-05-42B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 10/20/16 0:00 | 209.99 | 210.05 | 210.12 | 0.000888 | 249.98 | 0.147946 | 249.98 | 0.00 |
| 3/2/17 0:00 | 212.36 | 212.40 | 212.36 | 0.000475 | 297.56 | 0.079164 | 297.56 | 0.00 |
| 11/2/17 0:00 | 212.26 | 212.32 | 212.28 | 0.000702 | 289.31 | 0.117041 | 289.31 | 0.00 |
| 5/22/18 0:00 | 211.98 | 212.03 | 211.96 | 0.000619 | 306.93 | 0.103249 | 306.93 | 0.00 |
| 11/1/18 0:00 | 212.73 | 212.23 | 212.12 | 0.006217 | 87.92 | 1.036206 | 87.92 | 0.00 |
| 5/13/19 0:00 | 212.95 | 212.97 | 212.81 | 0.000792 | 0.54 | 0.132053 | 0.54 | 0.00 |
| 10/22/19 0:00 | 209.66 | 210.81 | 209.30 | 0.014088 | 304.97 | 2.348029 | 304.97 | 0.00 |
| 11/4/20 0:00 | 210.65 | 210.71 | 210.80 | 0.000954 | 245.11 | 0.158959 | 245.11 | 0.00 |

| | Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 10/20/16 0:00 | 0.000834019 | 0.000303944 | -1235.785 | -0.000834 | -0.000304 | 3 | -0.139003 | -0.050657 | 3 | 629,983.58 | 3,028,250.24 | 629,979.41 | 3,028,248.72 | 629,983.58 | 3,028,250.24 | 629,962.73 | 3,028,242.64 |
| 3/2/17 0:00 | 0.000421065 | -0.000219799 | 612.71646 | -0.000421 | 0.000220 | 4 | -0.070177 | 0.036633 | 4 | 629,983.58 | 3,028,250.24 | 629,981.47 | 3,028,251.34 | 629,983.58 | 3,028,250.24 | 629,973.05 | 3,028,255.74 |
| 11/2/17 0:00 | 0.000662739 | -0.000232215 | 497.97788 | -0.000663 | 0.000232 | 4 | -0.110456 | 0.038703 | 4 | 629,983.58 | 3,028,250.24 | 629,980.26 | 3,028,251.40 | 629,983.58 | 3,028,250.24 | 629,967.01 | 3,028,256.05 |
| 5/22/18 0:00 | 0.000495189 | -0.000372233 | 1027.2424 | -0.000495 | 0.000372 | 4 | -0.082532 | 0.062039 | 4 | 629,983.58 | 3,028,250.24 | 629,981.10 | 3,028,252.10 | 629,983.58 | 3,028,250.24 | 629,971.20 | 3,028,259.55 |
| 11/1/18 0:00 | -0.006213134 | -0.000225759 | 4810.1868 | 0.006213 | 0.000226 | 1 | 1.035522 | 0.037626 | 1 | 629,983.58 | 3,028,250.24 | 630,014.64 | 3,028,251.37 | 629,983.58 | 3,028,250.24 | 630,138.91 | 3,028,255.89 |
| 5/13/19 0:00 | -7.46031E-06 | -0.000792285 | 2616.8459 | 0.000007 | 0.000792 | 1 | 0.001243 | 0.132047 | 1 | 629,983.58 | 3,028,250.24 | 629,983.61 | 3,028,254.20 | 629,983.58 | 3,028,250.24 | 629,983.76 | 3,028,270.05 |
| 10/22/19 0:00 | 0.011545057 | -0.008073931 | 17386.611 | -0.011545 | 0.008074 | 4 | -1.924176 | 1.345655 | 4 | 629,983.58 | 3,028,250.24 | 629,925.85 | 3,028,290.61 | 629,983.58 | 3,028,250.24 | 629,694.95 | 3,028,452.09 |
| 11/4/20 0:00 | 0.000865161 | 0.000401428 | -1549.941 | -0.000865 | -0.000401 | 3 | -0.144193 | -0.066905 | 3 | 629,983.58 | 3,028,250.24 | 629,979.25 | 3,028,248.24 | 629,983.58 | 3,028,250.24 | 629,961.95 | 3,028,240.21 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 18 |
| Date: | |

| Well Location | | | |
|---|---|---|---|
| Well Name | X Coordinate (L) | Y Coordinate (L) | |
| SHP-2016-3B | 630,007.26 | 3,028,174.29 | 1 |
| SHP-2016-4B | 629,902.15 | 3,028,146.65 | 1 |
| SHP-2016-5B | 629,963.58 | 3,028,113.45 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

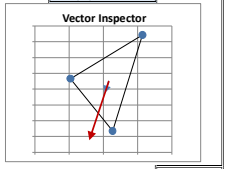
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 31 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | SHP-2016-3B | SHP-2016-4B | SHP-2016-5B |
| Maximum = | 212.97 | 213.01 | 213.02 |
| Minimum = | 210.05 | 209.97 | 209.94 |
| Average = | 211.63 | 211.56 | 211.56 |
| Range = | 2.92 | 3.04 | 3.08 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.001908 | 0.318028 |
| Minimum = | 0.000240 | 0.040008 |
| Average = | 0.001122 | 0.187012 |

10/22/19 12:00 AM

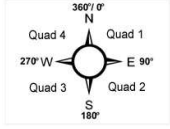



| | | Suggested Scaling Factors |
|---|---|---|
| Hydraulic Gradient Vector is BLUE | | |
| Groundwater Velocity Vector is RED | | |
| Hyd. Grad. Scale Factor = | 5,000.00 | 28,478.50 |
| Velocity Scale Factor = | 150.00 | 170.87 |

| Number of Measurements | |
|---|---|
| Date/Time | 10 |
| SHP-2016-3B | 10 |
| SHP-2016-4B | 10 |
| SHP-2016-5B | 10 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,957.66 | 3,028,144.80 | 629,952.01 | 3,028,137.35 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,957.66 | 3,028,144.80 | 629,929.40 | 3,028,107.56 |

| | Number of Vectors | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 1 | 1 |
| 90 -180 | 0 | 0 |
| 180 -270 | 7 | 7 |
| 270 - 360 | 2 | 2 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 629,957.66 | 3,028,144.80 | |
| Triangle Area | 2,593.79 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 108.68 | (L) | SHP-2016-3B 39.59 |
| Distance #2 - #3 | 69.83 | (L) | SHP-2016-4B 43.12 |
| Distance #1 - #3 | 74.90 | (L) | SHP-2016-5B 97.29 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 630,007.26 | 3,028,174.29 | 629,902.15 | 3,028,146.65 |
| Nodes #2-#3 | 629,902.15 | 3,028,146.65 | 629,963.58 | 3,028,113.45 |
| Nodes #1-#3 | 630,007.26 | 3,028,174.29 | 629,963.58 | 3,028,113.45 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | SHP-2016-3B | SHP-2016-4B | SHP-2016-5B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 210.11 | 210.00 | 210.00 | 0.001481 | 208.39 | 0.246776 | 208.39 | 0.00 |
| 10/20/16 0:00 | 210.05 | 209.97 | 209.94 | 0.001595 | 192.76 | 0.265761 | 192.76 | 0.00 |
| 3/2/17 0:00 | 212.40 | 212.37 | 212.36 | 0.000640 | 195.46 | 0.106710 | 195.46 | 0.00 |
| 11/2/17 0:00 | 212.32 | 212.23 | 212.25 | 0.000950 | 225.94 | 0.158304 | 225.94 | 0.00 |
| 5/22/18 0:00 | 212.03 | 212.01 | 212.02 | 0.000240 | 271.88 | 0.040008 | 271.88 | 0.00 |
| 11/1/18 0:00 | 212.23 | 212.19 | 212.16 | 0.001086 | 185.08 | 0.180965 | 185.08 | 0.00 |
| 5/13/19 0:00 | 212.97 | 213.01 | 213.02 | 0.000706 | 16.69 | 0.117669 | 16.69 | 0.00 |
| 10/22/19 0:00 | 210.81 | 210.65 | 210.67 | 0.001870 | 217.20 | 0.311652 | 217.20 | 0.00 |
| 5/18/20 0:00 | 212.63 | 212.62 | 212.66 | 0.000745 | 338.18 | 0.124247 | 338.18 | 0.00 |
| 11/4/20 0:00 | 210.71 | 210.58 | 210.57 | 0.001908 | 204.09 | 0.318028 | 204.09 | 0.00 |

| | Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 8/16/16 0:00 | 0.00070399 | 0.00130259 | -4177.879 | -0.000704 | -0.001303 | 3 | -0.117332 | -0.217098 | 3 | 629,957.66 | 3,028,144.80 | 629,954.14 | 3,028,138.28 | 629,957.66 | 3,028,144.80 | 629,940.06 | 3,028,112.23 |
| 10/20/16 0:00 | 0.000352149 | 0.001555193 | -4721.203 | -0.000352 | -0.001555 | 3 | -0.058692 | -0.259199 | 3 | 629,957.66 | 3,028,144.80 | 629,955.90 | 3,028,137.02 | 629,957.66 | 3,028,144.80 | 629,948.86 | 3,028,105.92 |
| 3/2/17 0:00 | 0.000170716 | 0.000617079 | -1763.774 | -0.000171 | -0.000617 | 3 | -0.028453 | -0.102846 | 3 | 629,957.66 | 3,028,144.80 | 629,956.81 | 3,028,141.71 | 629,957.66 | 3,028,144.80 | 629,953.40 | 3,028,129.37 |
| 11/2/17 0:00 | 0.000682554 | 0.000660519 | -2217.86 | -0.000683 | -0.000661 | 3 | -0.113759 | -0.110086 | 3 | 629,957.66 | 3,028,144.80 | 629,954.25 | 3,028,141.49 | 629,957.66 | 3,028,144.80 | 629,940.60 | 3,028,128.28 |
| 5/22/18 0:00 | 0.000239919 | -7.8843E-06 | 84.754157 | -0.000240 | 0.000008 | 4 | -0.039987 | 0.001314 | 4 | 629,957.66 | 3,028,144.80 | 629,956.46 | 3,028,144.84 | 629,957.66 | 3,028,144.80 | 629,951.67 | 3,028,144.99 |
| 11/1/18 0:00 | 9.61528E-05 | 0.001081524 | -3123.391 | -0.000096 | -0.001082 | 3 | -0.016025 | -0.180254 | 3 | 629,957.66 | 3,028,144.80 | 629,957.18 | 3,028,139.39 | 629,957.66 | 3,028,144.80 | 629,955.26 | 3,028,117.76 |
| 5/13/19 0:00 | -0.000202715 | -0.000676288 | 2388.5984 | 0.000203 | 0.000676 | 1 | 0.033786 | 0.112715 | 1 | 629,957.66 | 3,028,144.80 | 629,958.68 | 3,028,148.18 | 629,957.66 | 3,028,144.80 | 629,962.73 | 3,028,161.70 |
| 10/22/19 0:00 | 0.001130547 | 0.00148944 | -5011.726 | -0.001131 | -0.001489 | 3 | -0.188424 | -0.248240 | 3 | 629,957.66 | 3,028,144.80 | 629,952.01 | 3,028,137.35 | 629,957.66 | 3,028,144.80 | 629,929.40 | 3,028,107.56 |
| 5/18/20 0:00 | 0.000277124 | -0.000692056 | 2133.7067 | -0.000277 | 0.000692 | 4 | -0.046187 | 0.115343 | 4 | 629,957.66 | 3,028,144.80 | 629,956.28 | 3,028,148.26 | 629,957.66 | 3,028,144.80 | 629,950.74 | 3,028,162.10 |
| 11/4/20 0:00 | 0.000778706 | 0.001742043 | -5555.091 | -0.000779 | -0.001742 | 3 | -0.129784 | -0.290341 | 3 | 629,957.66 | 3,028,144.80 | 629,953.77 | 3,028,136.09 | 629,957.66 | 3,028,144.80 | 629,938.20 | 3,028,101.25 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 19 |
| Date: | |

| Well Location | | | |
|---|---|---|---|
| Well Name | X Coordinate (L) | Y Coordinate (L) | |
| EPA-PZ-2012-4B | 629,989.87 | 3,028,043.80 | 1 |
| SHP-2016-1B | 629,933.53 | 3,027,979.56 | 1 |
| SHP-05-45B | 629,995.45 | 3,027,956.77 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

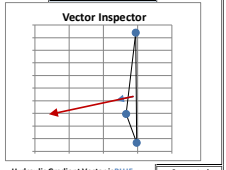
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 30 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-4B | SHP-2016-1B | SHP-05-45B |
| Maximum = | 212.93 | 211.83 | 213.24 |
| Minimum = | 209.82 | 208.78 | 210.07 |
| Average = | 211.36 | 210.24 | 211.57 |
| Range = | 3.11 | 3.05 | 3.17 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.026965 | 4.494240 |
| Minimum = | 0.016033 | 2.672200 |
| Average = | 0.021101 | 3.516773 |

10/22/19 12:00 AM

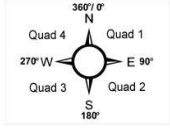



| | | Suggested Scaling Factors |
|---|---|---|
| Hydraulic Gradient Vector is BLUE | | |
| Groundwater Velocity Vector is RED | | |
| Hyd. Grad. Scale Factor = | 5,000.00 | 1,617.05 |
| Velocity Scale Factor = | 150.00 | 9.70 |

| Number of Measurements | |
|---|---|
| Date/Time | 9 |
| EPA-PZ-2012-4B | 9 |
| SHP-2016-1B | 9 |
| SHP-05-45B | 9 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,972.95 | 3,027,993.38 | 629,875.01 | 3,027,990.54 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,972.95 | 3,027,993.38 | 629,483.24 | 3,027,979.21 |

| | Number of Vectors | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 0 | 0 |
| 90 -180 | 0 | 0 |
| 180 -270 | 3 | 3 |
| 270 - 360 | 6 | 6 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 629,972.95 | 3,027,993.38 | |
| Triangle Area | 2,630.86 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 85.45 | (L) | EPA-PZ-2012-4B 44.92 |
| Distance #2 - #3 | 65.98 | (L) | SHP-2016-1B 68.96 |
| Distance #1 - #3 | 87.21 | (L) | SHP-05-45B 66.12 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 629,989.87 | 3,028,043.80 | 629,933.53 | 3,027,979.56 |
| Nodes #2-#3 | 629,933.53 | 3,027,979.56 | 629,995.45 | 3,027,956.77 |
| Nodes #1-#3 | 629,989.87 | 3,028,043.80 | 629,995.45 | 3,027,956.77 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-4B | SHP-2016-1B | SHP-05-45B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 209.90 | 209.20 | 210.27 | 0.016414 | 281.31 | 2.735717 | 281.31 | 0.00 |
| 10/20/16 0:00 | 209.82 | 208.78 | 210.07 | 0.020315 | 274.44 | 3.385859 | 274.44 | 0.00 |
| 3/2/17 0:00 | 212.32 | 211.16 | 212.40 | 0.020167 | 268.94 | 3.361143 | 268.94 | 0.00 |
| 11/2/17 0:00 | 212.08 | 211.23 | 212.24 | 0.016033 | 272.90 | 2.672200 | 272.90 | 0.00 |
| 5/22/18 0:00 | 211.83 | 210.65 | 212.17 | 0.023789 | 275.76 | 3.964801 | 275.76 | 0.00 |
| 11/1/18 0:00 | 212.21 | 210.59 | 212.22 | 0.026965 | 266.58 | 4.494240 | 266.58 | 0.00 |
| 5/13/19 0:00 | 212.93 | 211.83 | 213.24 | 0.022084 | 275.59 | 3.680703 | 275.59 | 0.00 |
| 10/22/19 0:00 | 210.63 | 209.49 | 210.69 | 0.019597 | 268.34 | 3.266100 | 268.34 | 0.00 |
| 11/4/20 0:00 | 210.49 | 209.24 | 210.80 | 0.024541 | 274.66 | 4.090199 | 274.66 | 0.00 |

| | Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 8/16/16 0:00 | 0.016095481 | -0.003219425 | -181.5316 | -0.016095 | 0.003219 | 4 | -2.682580 | 0.536571 | 4 | 629,972.95 | 3,027,993.38 | 629,892.47 | 3,028,009.47 | 629,972.95 | 3,027,993.38 | 629,570.56 | 3,028,073.86 |
| 10/20/16 0:00 | 0.020254088 | -0.001573955 | -7784.045 | -0.020254 | 0.001574 | 4 | -3.375681 | 0.262326 | 4 | 629,972.95 | 3,027,993.38 | 629,871.68 | 3,028,001.25 | 629,972.95 | 3,027,993.38 | 629,466.60 | 3,028,032.73 |
| 3/2/17 0:00 | 0.020163395 | 0.000373579 | -13621.63 | -0.020163 | -0.000374 | 3 | -3.360566 | -0.062263 | 3 | 629,972.95 | 3,027,993.38 | 629,872.13 | 3,027,991.51 | 629,972.95 | 3,027,993.38 | 629,468.87 | 3,027,984.04 |
| 11/2/17 0:00 | 0.016012637 | -0.000811776 | -7417.627 | -0.016013 | 0.000812 | 4 | -2.668773 | 0.135296 | 4 | 629,972.95 | 3,027,993.38 | 629,892.89 | 3,027,997.44 | 629,972.95 | 3,027,993.38 | 629,572.63 | 3,028,013.67 |
| 5/22/18 0:00 | 0.023668528 | -0.00238916 | -7464.621 | -0.023669 | 0.002389 | 4 | -3.944755 | 0.398193 | 4 | 629,972.95 | 3,027,993.38 | 629,854.61 | 3,028,005.32 | 629,972.95 | 3,027,993.38 | 629,381.24 | 3,028,053.11 |
| 11/1/18 0:00 | 0.026917278 | 0.001610933 | -21623.38 | -0.026917 | -0.001611 | 3 | -4.486213 | -0.268489 | 3 | 629,972.95 | 3,027,993.38 | 629,838.36 | 3,027,985.32 | 629,972.95 | 3,027,993.38 | 629,300.02 | 3,027,953.10 |
| 5/13/19 0:00 | 0.02197904 | -0.002152775 | -7114.945 | -0.021979 | 0.002153 | 4 | -3.663173 | 0.358796 | 4 | 629,972.95 | 3,027,993.38 | 629,863.05 | 3,028,004.14 | 629,972.95 | 3,027,993.38 | 629,423.47 | 3,028,047.20 |
| 10/22/19 0:00 | 0.019588411 | 0.000566519 | -13845.31 | -0.019588 | -0.000567 | 3 | -3.264735 | -0.094420 | 3 | 629,972.95 | 3,027,993.38 | 629,875.01 | 3,027,990.54 | 629,972.95 | 3,027,993.38 | 629,483.24 | 3,027,979.21 |
| 11/4/20 0:00 | 0.024460076 | -0.0019937 | -9162.098 | -0.024460 | 0.001994 | 4 | -4.076679 | 0.332283 | 4 | 629,972.95 | 3,027,993.38 | 629,850.65 | 3,028,003.35 | 629,972.95 | 3,027,993.38 | 629,361.45 | 3,028,043.22 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 20 |
| Date: | |

| Well Name | Well Location X Coordinate (L) | Y Coordinate (L) | |
|---|---|---|---|
| EPA-PZ-2012-6B | 629,894.40 | 3,028,069.24 | 1 |
| SHP-2016-4B | 629,902.15 | 3,028,146.65 | 1 |
| SHP-2016-5B | 629,963.58 | 3,028,113.45 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

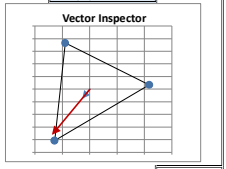
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 31 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-6B | SHP-2016-4B | SHP-2016-5B |
| Maximum = | 212.96 | 213.01 | 213.02 |
| Minimum = | 209.83 | 209.97 | 209.94 |
| Average = | 211.50 | 211.56 | 211.56 |
| Range = | 3.13 | 3.04 | 3.08 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.001822 | 0.303694 |
| Minimum = | 0.000451 | 0.075180 |
| Average = | 0.001150 | 0.191710 |

10/22/19 12:00 AM

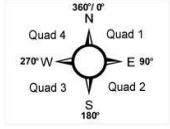



| | | Suggested Scaling Factors |
|---|---|---|
| Hydraulic Gradient Vector is BLUE | | |
| Groundwater Velocity Vector is RED | | |
| Hyd. Grad. Scale Factor = | 5,000.00 | 22,528.14 |
| Velocity Scale Factor = | 150.00 | 135.17 |

| Number of Measurements | |
|---|---|
| Date/Time | 10 |
| EPA-PZ-2012-6B | 10 |
| SHP-2016-4B | 10 |
| SHP-2016-5B | 10 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,920.04 | 3,028,109.78 | 629,914.52 | 3,028,102.58 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,920.04 | 3,028,109.78 | 629,892.45 | 3,028,073.79 |

| Number of Vectors | | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 1 | 1 |
| 90 -180 | 0 | 0 |
| 180 -270 | 8 | 8 |
| 270 - 360 | 1 | 1 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 629,920.04 | 3,028,109.78 | |
| Triangle Area | 2,506.30 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 77.80 | (L) | EPA-PZ-2012-6B 51.70 |
| Distance #2 - #3 | 69.83 | (L) | SHP-2016-4B 67.33 |
| Distance #1 - #3 | 82.10 | (L) | SHP-2016-5B 60.97 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 629,894.40 | 3,028,069.24 | 629,902.15 | 3,028,146.65 |
| Nodes #2-#3 | 629,902.15 | 3,028,146.65 | 629,963.58 | 3,028,113.45 |
| Nodes #1-#3 | 629,894.40 | 3,028,069.24 | 629,963.58 | 3,028,113.45 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-6B | SHP-2016-4B | SHP-2016-5B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 209.94 | 210.00 | 210.00 | 0.000836 | 208.39 | 0.139304 | 208.39 | 0.00 |
| 10/20/16 0:00 | 209.83 | 209.97 | 209.94 | 0.001822 | 194.75 | 0.303694 | 194.75 | 0.00 |
| 3/2/17 0:00 | 212.33 | 212.37 | 212.36 | 0.000451 | 189.88 | 0.075180 | 189.88 | 0.00 |
| 11/2/17 0:00 | 212.16 | 212.23 | 212.25 | 0.001132 | 223.05 | 0.188604 | 223.05 | 0.00 |
| 5/22/18 0:00 | 211.92 | 212.01 | 212.02 | 0.001361 | 217.47 | 0.226757 | 217.47 | 0.00 |
| 11/1/18 0:00 | 212.21 | 212.19 | 212.16 | 0.000628 | 71.55 | 0.104671 | 71.55 | 0.00 |
| 5/13/19 0:00 | 212.96 | 213.01 | 213.02 | 0.000770 | 219.11 | 0.128297 | 219.11 | 0.00 |
| 10/22/19 0:00 | 210.53 | 210.65 | 210.67 | 0.001814 | 217.47 | 0.302342 | 217.47 | 0.00 |
| 5/18/20 0:00 | 212.69 | 212.62 | 212.66 | 0.000933 | 350.49 | 0.155420 | 350.49 | 0.00 |
| 11/4/20 0:00 | 210.45 | 210.58 | 210.57 | 0.001757 | 203.71 | 0.292830 | 203.71 | 0.00 |

| Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 0.0003974 | 0.000735308 | -2266.944 | -0.000397 | -0.000735 | 3 | -0.066233 | -0.122551 | 3 | 629,920.04 | 3,028,109.78 | 629,918.06 | 3,028,106.10 | 629,920.04 | 3,028,109.78 | 629,910.11 | 3,028,091.40 |
| 0.000463973 | 0.001762102 | -5418.191 | -0.000464 | -0.001762 | 3 | -0.077329 | -0.293684 | 3 | 629,920.04 | 3,028,109.78 | 629,917.72 | 3,028,100.97 | 629,920.04 | 3,028,109.78 | 629,908.44 | 3,028,065.73 |
| 7.73856E-05 | 0.000444391 | -1182.061 | -0.000077 | -0.000444 | 3 | -0.012898 | -0.074065 | 3 | 629,920.04 | 3,028,109.78 | 629,919.66 | 3,028,107.56 | 629,920.04 | 3,028,109.78 | 629,918.11 | 3,028,098.67 |
| 0.000772495 | 0.000826937 | -2778.454 | -0.000772 | -0.000827 | 3 | -0.128749 | -0.137823 | 3 | 629,920.04 | 3,028,109.78 | 629,916.18 | 3,028,105.65 | 629,920.04 | 3,028,109.78 | 629,900.73 | 3,028,089.11 |
| 0.000827746 | 0.00107977 | -3579.097 | -0.000828 | -0.001080 | 3 | -0.137958 | -0.179962 | 3 | 629,920.04 | 3,028,109.78 | 629,915.90 | 3,028,104.38 | 629,920.04 | 3,028,109.78 | 629,899.35 | 3,028,082.79 |
| -0.000595759 | -0.00019872 | 1189.2122 | 0.000596 | 0.000199 | 1 | 0.099293 | 0.033120 | 1 | 629,920.04 | 3,028,109.78 | 629,923.02 | 3,028,110.77 | 629,920.04 | 3,028,109.78 | 629,934.94 | 3,028,114.75 |
| 0.000485597 | 0.000597296 | -1901.568 | -0.000486 | -0.000597 | 3 | -0.080933 | -0.099549 | 3 | 629,920.04 | 3,028,109.78 | 629,917.62 | 3,028,106.79 | 629,920.04 | 3,028,109.78 | 629,907.90 | 3,028,094.85 |
| 0.001103662 | 0.001439694 | -4844.153 | -0.001104 | -0.001440 | 3 | -0.183944 | -0.239949 | 3 | 629,920.04 | 3,028,109.78 | 629,914.52 | 3,028,102.58 | 629,920.04 | 3,028,109.78 | 629,892.45 | 3,028,073.79 |
| 0.000154091 | -0.000919703 | 2900.555 | -0.000154 | 0.000920 | 4 | -0.025682 | 0.153284 | 4 | 629,920.04 | 3,028,109.78 | 629,919.27 | 3,028,114.38 | 629,920.04 | 3,028,109.78 | 629,916.19 | 3,028,132.77 |
| 0.000706602 | 0.001608628 | -5105.673 | -0.000707 | -0.001609 | 3 | -0.117767 | -0.268105 | 3 | 629,920.04 | 3,028,109.78 | 629,916.51 | 3,028,101.74 | 629,920.04 | 3,028,109.78 | 629,902.38 | 3,028,069.56 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 21 |
| Date: | |

| Well Name | Well Location X Coordinate (L) | Y Coordinate (L) | |
|---|---|---|---|
| EPA-PZ-2012-6B | 629,894.40 | 3,028,069.24 | 1 |
| SHP-2016-5B | 629,963.58 | 3,028,113.45 | 1 |
| EPA-PZ-2012-4B | 629,989.87 | 3,028,043.80 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 50.0000 | (L/T) |
| $K_{min}$ = | 50.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.30 | (-) |

**User input cells are shaded green.**

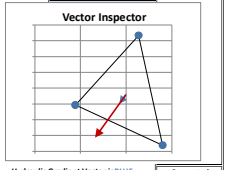
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 31 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-6B | SHP-2016-5B | EPA-PZ-2012-4B |
| Maximum = | 212.96 | 213.02 | 212.93 |
| Minimum = | 209.83 | 209.94 | 209.82 |
| Average = | 211.50 | 211.56 | 211.48 |
| Range = | 3.13 | 3.08 | 3.11 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.002666 | 0.444258 |
| Minimum = | 0.000516 | 0.085962 |
| Average = | 0.001616 | 0.269291 |

10/22/19 12:00 AM

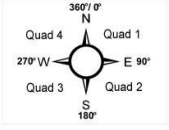



| | | Suggested Scaling Factors |
|---|---|---|
| Hydraulic Gradient Vector is BLUE | | |
| Groundwater Velocity Vector is RED | | |
| Hyd. Grad. Scale Factor = | 5,000.00 | 18,533.00 |
| Velocity Scale Factor = | 150.00 | 111.20 |

| Number of Measurements | |
|---|---|
| Date/Time | 10 |
| EPA-PZ-2012-6B | 10 |
| SHP-2016-5B | 10 |
| EPA-PZ-2012-4B | 10 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,949.28 | 3,028,075.50 | 629,942.61 | 3,028,070.11 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,949.28 | 3,028,075.50 | 629,915.91 | 3,028,048.54 |

| Number of Vectors | | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 1 | 1 |
| 90 -180 | 4 | 4 |
| 180 -270 | 5 | 5 |
| 270 - 360 | 0 | 0 |




| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 50.0000 | (L/T) |
| $K_{yy}$ = | 50.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |

| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 629,949.28 | 3,028,075.50 | |
| Triangle Area | 2,990.32 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 82.10 | (L) | EPA-PZ-2012-6B 47.50 |
| Distance #2 - #3 | 74.45 | (L) | SHP-2016-5B 78.10 |
| Distance #1 - #3 | 98.80 | (L) | EPA-PZ-2012-4B 54.40 |

| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 629,894.40 | 3,028,069.24 | 629,963.58 | 3,028,113.45 |
| Nodes #2-#3 | 629,963.58 | 3,028,113.45 | 629,989.87 | 3,028,043.80 |
| Nodes #1-#3 | 629,894.40 | 3,028,069.24 | 629,989.87 | 3,028,043.80 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-6B | SHP-2016-5B | EPA-PZ-2012-4B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 209.94 | 210.00 | 209.90 | 0.001421 | 178.37 | 0.236843 | 178.37 | 0.00 |
| 10/20/16 0:00 | 209.83 | 209.94 | 209.82 | 0.001913 | 191.89 | 0.318773 | 191.89 | 0.00 |
| 3/2/17 0:00 | 212.33 | 212.36 | 212.32 | 0.000516 | 183.60 | 0.085962 | 183.60 | 0.00 |
| 11/2/17 0:00 | 212.16 | 212.25 | 212.08 | 0.002371 | 174.95 | 0.395209 | 174.95 | 0.00 |
| 5/22/18 0:00 | 211.92 | 212.02 | 211.83 | 0.002666 | 176.09 | 0.444258 | 176.09 | 0.00 |
| 11/1/18 0:00 | 212.21 | 212.16 | 212.21 | 0.000826 | 14.92 | 0.137668 | 14.92 | 0.00 |
| 5/13/19 0:00 | 212.96 | 213.02 | 212.93 | 0.001305 | 181.47 | 0.217539 | 181.47 | 0.00 |
| 10/22/19 0:00 | 210.53 | 210.67 | 210.63 | 0.001716 | 231.07 | 0.285960 | 231.07 | 0.00 |
| 5/18/20 0:00 | 212.69 | 212.66 | 212.54 | 0.001763 | 135.45 | 0.293769 | 135.45 | 0.00 |
| 11/4/20 0:00 | 210.45 | 210.57 | 210.49 | 0.001662 | 209.02 | 0.276924 | 209.02 | 0.00 |

| | Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 8/16/16 0:00 | -4.0464E-05 | 0.001420481 | -4065.886 | 0.000040 | -0.001420 | 2 | 0.006744 | -0.236747 | 2 | 629,949.28 | 3,028,075.50 | 629,949.49 | 3,028,068.39 | 629,949.28 | 3,028,075.50 | 629,950.29 | 3,028,039.98 |
| 10/20/16 0:00 | 0.000393986 | 0.001871619 | -5705.731 | -0.000394 | -0.001872 | 3 | -0.065664 | -0.311936 | 3 | 629,949.28 | 3,028,075.50 | 629,947.31 | 3,028,066.14 | 629,949.28 | 3,028,075.50 | 629,939.43 | 3,028,028.71 |
| 3/2/17 0:00 | 3.2421E-05 | 0.000514752 | -1366.795 | -0.000032 | -0.000515 | 3 | -0.005404 | -0.085792 | 3 | 629,949.28 | 3,028,075.50 | 629,949.12 | 3,028,072.92 | 629,949.28 | 3,028,075.50 | 629,948.47 | 3,028,062.63 |
| 11/2/17 0:00 | -0.000208539 | 0.002362067 | -6808.986 | 0.000209 | -0.002362 | 2 | 0.034757 | -0.393678 | 2 | 629,949.28 | 3,028,075.50 | 629,950.33 | 3,028,063.69 | 629,949.28 | 3,028,075.50 | 629,954.50 | 3,028,016.45 |
| 5/22/18 0:00 | -0.000181694 | 0.002659351 | -7726.335 | 0.000182 | -0.002659 | 2 | 0.030282 | -0.443225 | 2 | 629,949.28 | 3,028,075.50 | 629,950.19 | 3,028,062.20 | 629,949.28 | 3,028,075.50 | 629,953.83 | 3,028,009.01 |
| 11/1/18 0:00 | -0.000212685 | -0.000798157 | 2763.0545 | 0.000213 | 0.000798 | 1 | 0.035448 | 0.133026 | 1 | 629,949.28 | 3,028,075.50 | 629,950.35 | 3,028,079.49 | 629,949.28 | 3,028,075.50 | 629,954.60 | 3,028,095.45 |
| 5/13/19 0:00 | 3.34576E-05 | 0.001304808 | -3759.163 | -0.000033 | -0.001305 | 3 | -0.005576 | -0.217468 | 3 | 629,949.28 | 3,028,075.50 | 629,949.12 | 3,028,068.97 | 629,949.28 | 3,028,075.50 | 629,948.45 | 3,028,042.88 |
| 10/22/19 0:00 | 0.001334734 | 0.00107811 | -3894.803 | -0.001335 | -0.001078 | 3 | -0.222456 | -0.179685 | 3 | 629,949.28 | 3,028,075.50 | 629,942.61 | 3,028,070.11 | 629,949.28 | 3,028,075.50 | 629,915.91 | 3,028,048.54 |
| 5/18/20 0:00 | -0.001236435 | 0.001256201 | -2812.351 | 0.001236 | -0.001256 | 2 | 0.206072 | -0.209367 | 2 | 629,949.28 | 3,028,075.50 | 629,955.47 | 3,028,069.22 | 629,949.28 | 3,028,075.50 | 629,980.19 | 3,028,044.09 |
| 11/4/20 0:00 | 0.000806131 | 0.001452885 | -4696.764 | -0.000806 | -0.001453 | 3 | -0.134355 | -0.242148 | 3 | 629,949.28 | 3,028,075.50 | 629,945.25 | 3,028,068.23 | 629,949.28 | 3,028,075.50 | 629,929.13 | 3,028,039.17 |

# Attachment 7 - 3PE Gradient Calculations

| | |
|---|---|
| Project: | Devens |
| Location: | Shepley's Hill Landfill Triangle 22 |
| Date: | |

| Well Name | Well Location X Coordinate (L) | Well Location Y Coordinate (L) | |
|---|---|---|---|
| EPA-PZ-2012-6B | 629,894.40 | 3,028,069.24 | 1 |
| EPA-PZ-2012-7B | 629,800.87 | 3,028,109.22 | 1 |
| SHP-2016-4B | 629,902.15 | 3,028,146.65 | 1 |

| Principal Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{max}$ = | 10.0000 | (L/T) |
| $K_{min}$ = | 10.0000 | (L/T) |
| Orientation of $K_{max}$ = | 90.00 | (degrees from N) |
| θ = | 0.00 | (degrees from X axis) |
| Effective Porosity = | 0.20 | (-) |

**User input cells are shaded green.**

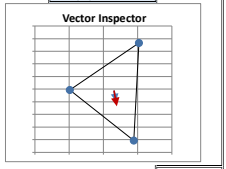
**HYDRAULIC HEAD DATA SET MUST NOT CONTAIN BLANK LINES**

| Vector Inspector Row of Interest: | 29 |
|---|---|
| Must be between 22 and 31 | |

| Statistics | | | |
|---|---|---|---|
| Head (L) | EPA-PZ-2012-6B | EPA-PZ-2012-7B | SHP-2016-4B |
| Maximum = | 212.96 | 213.07 | 213.01 |
| Minimum = | 209.83 | 209.91 | 209.97 |
| Average = | 211.50 | 211.54 | 211.56 |
| Range = | 3.13 | 3.16 | 3.04 |

| | Hyd. Grad. (L/L) | Velocity (L/T) |
|---|---|---|
| Maximum = | 0.002304 | 0.115183 |
| Minimum = | 0.000516 | 0.025805 |
| Average = | 0.001345 | 0.067238 |

10/22/19 12:00 AM



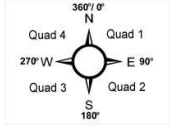

| | | Suggested Scaling Factors |
|---|---|---|
| Hydraulic Gradient Vector is BLUE | | |
| Groundwater Velocity Vector is RED | | |
| Hyd. Grad. Scale Factor = | 5,000.00 | 23,435.53 |
| Velocity Scale Factor = | 150.00 | 468.71 |

| Number of Measurements | |
|---|---|
| Date/Time | 10 |
| EPA-PZ-2012-6B | 10 |
| EPA-PZ-2012-7B | 10 |
| SHP-2016-4B | 10 |

| Vector Inspector Arrow Coordinates | | | |
|---|---|---|---|
| Plotted Hydraulic Gradient Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,865.81 | 3,028,108.37 | 629,868.27 | 3,028,100.37 |
| Plotted Groundwater Velocity Arrow Coordinates | | | |
| x_start | y_start | x_end | y_end |
| 629,865.81 | 3,028,108.37 | 629,869.50 | 3,028,096.37 |

| | Number of Vectors | |
|---|---|---|
| Orientation (deg) | i-vector | V-vector |
| 0 - 90 | 1 | 1 |
| 90 -180 | 6 | 6 |
| 180 -270 | 2 | 2 |
| 270 - 360 | 1 | 1 |

| Hydraulic Conductivity Components | | |
|---|---|---|
| $K_{xx}$ = | 10.0000 | (L/T) |
| $K_{yy}$ = | 10.0000 | (L/T) |
| $K_{xy}$ = $K_{yx}$ = | 0.0000 | (L/T) |




| Triangle Information | | | |
|---|---|---|---|
| Triangle Centroid (x,y) | 629,865.81 | 3,028,108.37 | |
| Triangle Area | 3,775.00 | (L^2) | Angle of Triangle (degrees) @ |
| Distance #1 - #2 | 101.72 | (L) | EPA-PZ-2012-6B 72.57 |
| Distance #2 - #3 | 107.98 | (L) | EPA-PZ-2012-7B 43.43 |
| Distance #1 - #3 | 77.80 | (L) | SHP-2016-4B 64.00 |

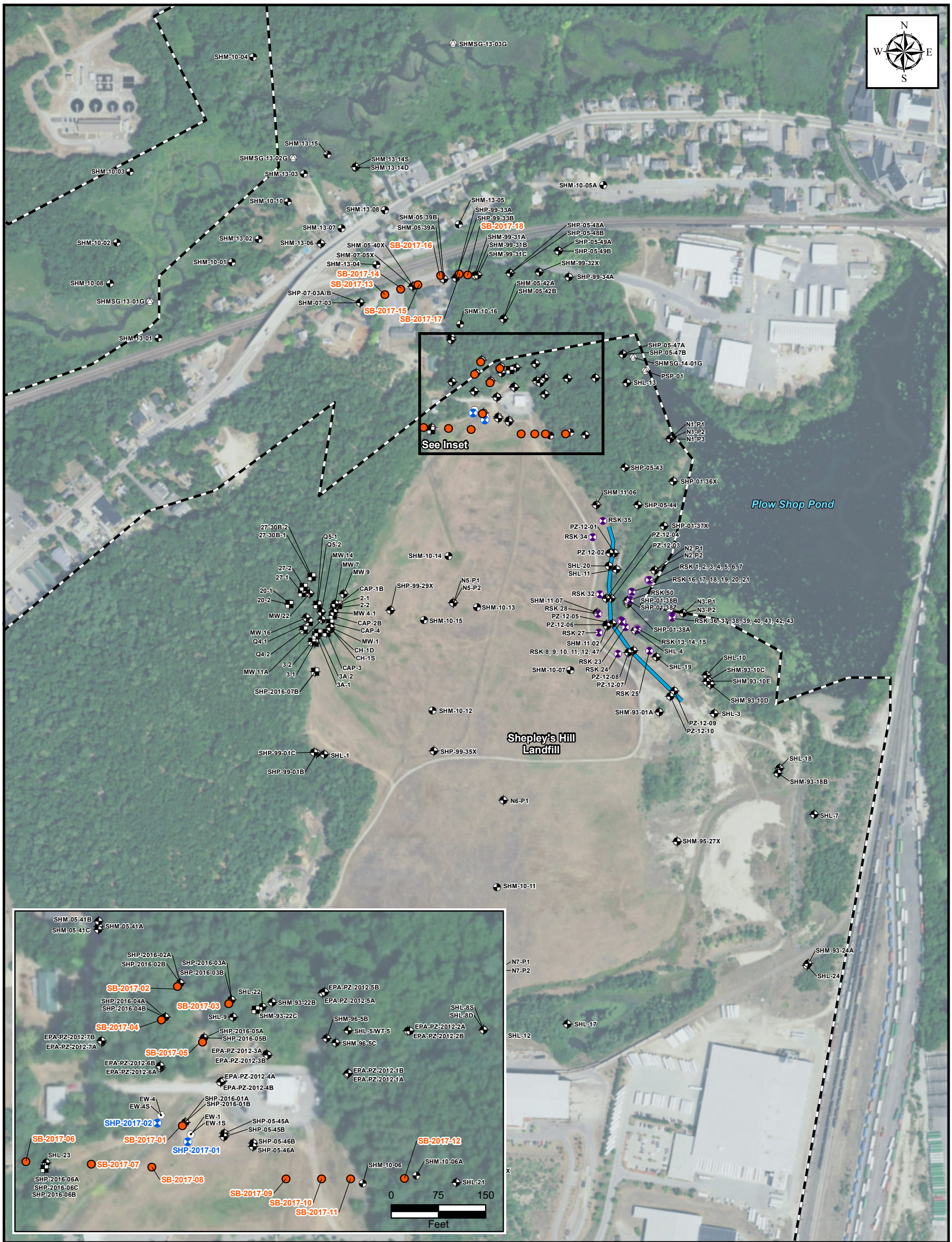
| Triangle Plot Coordinates | | | | |
|---|---|---|---|---|
| Triangle Sides | x_start | y_start | x_end | y_end |
| Nodes #1-#2 | 629,894.40 | 3,028,069.24 | 629,800.87 | 3,028,109.22 |
| Nodes #2-#3 | 629,800.87 | 3,028,109.22 | 629,902.15 | 3,028,146.65 |
| Nodes #1-#3 | 629,894.40 | 3,028,069.24 | 629,902.15 | 3,028,146.65 |

| | Hydraulic Head (L) | | | Hydraulic Gradient | | Groundwater Velocity | | Angle Between Vectors |
|---|---|---|---|---|---|---|---|---|
| Date/Time | EPA-PZ-2012-6B | EPA-PZ-2012-7B | SHP-2016-4B | Magnitude (L/L) | Direction (deg) | Magnitude (L/T) | Direction (deg) | (deg) |
| 8/16/16 0:00 | 209.94 | 210.02 | 210.00 | 0.000966 | 148.67 | 0.048317 | 148.67 | 0.00 |
| 10/20/16 0:00 | 209.83 | 209.91 | 209.97 | 0.001818 | 177.51 | 0.090908 | 177.51 | 0.00 |
| 3/2/17 0:00 | 212.33 | 212.35 | 212.37 | 0.000516 | 180.75 | 0.025805 | 180.75 | 0.00 |
| 11/2/17 0:00 | 212.16 | 212.16 | 212.23 | 0.000943 | 203.14 | 0.047153 | 203.14 | 0.00 |
| 5/22/18 0:00 | 211.92 | 212.02 | 212.01 | 0.001336 | 155.74 | 0.066775 | 155.74 | 0.00 |
| 11/1/18 0:00 | 212.21 | 211.98 | 212.19 | 0.002304 | 282.12 | 0.115183 | 282.12 | 0.00 |
| 5/13/19 0:00 | 212.96 | 213.07 | 213.01 | 0.001132 | 130.32 | 0.056594 | 130.32 | 0.00 |
| 10/22/19 0:00 | 210.53 | 210.64 | 210.65 | 0.001674 | 162.89 | 0.083678 | 162.89 | 0.00 |
| 5/18/20 0:00 | 212.69 | 212.66 | 212.62 | 0.000900 | 4.02 | 0.045009 | 4.02 | 0.00 |
| 11/4/20 0:00 | 210.45 | 210.58 | 210.58 | 0.001859 | 159.72 | 0.092959 | 159.72 | 0.00 |

| | Planar Equation Constants | | | Hydraulic Gradient Vector Components | | | Groundwater Velocity Vector Components | | | Hydraulic Gradient Arrow Plot Coordinates | | | | Groundwater Velocity Arrow Plot Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | A | B | C | $i_x$ | $i_y$ | i-Quad | $V_x$ | $V_y$ | V-Quad | x_start | y_start | x_end | y_end | x_start | y_start | x_end | y_end |
| 8/16/16 0:00 | -0.000502516 | 0.000825404 | -1972.907 | 0.000503 | -0.000825 | 2 | 0.025126 | -0.041270 | 2 | 629,865.81 | 3,028,108.37 | 629,868.32 | 3,028,104.24 | 629,865.81 | 3,028,108.37 | 629,869.58 | 3,028,102.18 |
| 10/20/16 0:00 | -7.88874E-05 | 0.00181645 | -5240.815 | 0.000079 | -0.001816 | 2 | 0.003944 | -0.090822 | 2 | 629,865.81 | 3,028,108.37 | 629,866.20 | 3,028,099.29 | 629,865.81 | 3,028,108.37 | 629,866.40 | 3,028,094.75 |
| 3/2/17 0:00 | 6.75496E-06 | 0.000516053 | -1354.569 | -0.000007 | -0.000516 | 3 | -0.000338 | -0.025803 | 3 | 629,865.81 | 3,028,108.37 | 629,865.77 | 3,028,105.79 | 629,865.81 | 3,028,108.37 | 629,865.76 | 3,028,104.50 |
| 11/2/17 0:00 | 0.000370675 | 0.000867165 | -2647.163 | -0.000371 | -0.000867 | 3 | -0.018534 | -0.043358 | 3 | 629,865.81 | 3,028,108.37 | 629,863.95 | 3,028,104.03 | 629,865.81 | 3,028,108.37 | 629,863.03 | 3,028,101.87 |
| 5/22/18 0:00 | -0.000548715 | 0.001217576 | -3129.351 | 0.000549 | -0.001218 | 2 | 0.027436 | -0.060879 | 2 | 629,865.81 | 3,028,108.37 | 629,868.55 | 3,028,102.28 | 629,865.81 | 3,028,108.37 | 629,869.92 | 3,028,099.24 |
| 11/1/18 0:00 | 0.002252277 | -0.000483854 | 258.65693 | -0.002252 | 0.000484 | 4 | -0.112614 | 0.024193 | 4 | 629,865.81 | 3,028,108.37 | 629,854.55 | 3,028,110.79 | 629,865.81 | 3,028,108.37 | 629,848.91 | 3,028,112.00 |
| 5/13/19 0:00 | -0.000863059 | 0.000732318 | -1460.912 | 0.000863 | -0.000732 | 2 | 0.043153 | -0.036616 | 2 | 629,865.81 | 3,028,108.37 | 629,870.12 | 3,028,104.71 | 629,865.81 | 3,028,108.37 | 629,872.28 | 3,028,102.88 |
| 10/22/19 0:00 | -0.000492384 | 0.001599483 | -4322.665 | 0.000492 | -0.001599 | 2 | 0.024619 | -0.079974 | 2 | 629,865.81 | 3,028,108.37 | 629,868.27 | 3,028,100.37 | 629,865.81 | 3,028,108.37 | 629,869.50 | 3,028,096.37 |
| 5/18/20 0:00 | -6.30861E-05 | -0.00089796 | 2971.5126 | 0.000063 | 0.000898 | 1 | 0.003154 | 0.044898 | 1 | 629,865.81 | 3,028,108.37 | 629,866.12 | 3,028,112.86 | 629,865.81 | 3,028,108.37 | 629,866.28 | 3,028,115.10 |
| 11/4/20 0:00 | -0.00064449 | 0.001743894 | -4664.22 | 0.000644 | -0.001744 | 2 | 0.032224 | -0.087195 | 2 | 629,865.81 | 3,028,108.37 | 629,869.03 | 3,028,099.65 | 629,865.81 | 3,028,108.37 | 629,870.64 | 3,028,095.29 |

# Attachment 8

## 2017 Vertical Profile Locations and Sampling Results




Legend

- New Boring Location
- New Piezometer Location
- Overburden Monitoring Well/Piezometer
- Groundwater Profiling Location/Monitoring Well
- Monitoring Well
- Bedrock Monitoring Well
- Bedrock Study Core
- Extraction Well
- Stream Gauge
- Barrier Wall
- Former Fort Devens Boundary

References: Sovereign/HGL LTMMP 2015

Aerial Sources: Esri, DigitalGlobe, GeoEye, i-cubed, USDA FSA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

# Shepley's Hill Landfill Site Plan

New Boring Locations for
Technical Memorandum, Phase I, Tasks 1-3

Former Fort Devens Army Installation and Sudbury Annex
Devens, Massachusetts

**KOMAN Government Solutions, LLC**
293 Boston Post Road West, Suite 100, Marlborough, MA 01752

0 200 400 Feet

Date: 10/23/2017

Figure 2

KGS

File: TMP1_OCT2017_SHL_NIA_SITE.mxd

**Former Fort Devens**
**2017 Vertical Profile Sampling Results**
Historical Long Term Monitoring Data
Former Fort Devens, Long Term Monitoring

| | | | | Analytical Method | GENCHEM | | | Metals | | | pH | SW9040 | SW9060 | Field Parameters | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte | Alkalinity, Total (as CaCO3) | Chloride | Sulfate | Arsenic | Iron | Manganese | pH | pH | Dissolved Organic Carbon | Dissolved Oxygen | Oxidation Reduction | pH | Specific Conductivity | Temperature | Turbidity |
| | | | | Units | mg/L | mg/L | mg/L | µg/L | µg/L | µg/L | pH Units | pH Units | mg/L | mg/L | mv | pH Units | µS/cm | °C | NTU |
| Location | Sample ID | SBD | SED | Date | | | | 10* | 9,100* | 1,715* | | | | | | | | | |
| SB-2017-01 | SB-2017-01-22-24 | 22 | 24 | 08/29/2017 | 87 | 1.8 | 5.0 | 51 | 13,000 | 580 | --- | --- | 5.9 | 0.98 | -65 | 6.8 | 200 | 12 | 0.99 |
| SB-2017-01 | SB-2017-01-32-34 | 32 | 34 | 08/29/2017 | 35 | 0.82 | 3.1 | 3.9 | 2,200 | 82 | --- | --- | 2.5 | 0.98 | -65 | 6.8 | 200 | 12 | 0.99 |
| SB-2017-01 | SB-2017-01-42-44 | 42 | 44 | 08/30/2017 | 450 | 11 | 0.70 J | 47 | 85,000 | 1,700 | --- | --- | 17 | 0.97 | -100 | 6.8 | 360 | 12 | 1.8 |
| SB-2017-01 | SB-2017-01-52-54 | 52 | 54 | 08/30/2017 | 310 | 5.4 | 0.65 J | 130 J | 83,000 | 1,600 | --- | --- | 6.9 | 0.97 | -100 | 6.8 | 360 | 12 | 1.8 |
| SB-2017-01 | SB-2017-01-62-64 | 62 | 64 | 08/30/2017 | 330 | 6.7 | 0.40 J | 81 | 71,000 | 2,000 | --- | --- | 7.8 | 0.97 | -100 | 6.8 | 360 | 12 | 1.8 |
| SB-2017-01 | SB-2017-01-72-74 | 72 | 74 | 08/31/2017 | 63 | 17 | 6.7 | 26 | 13,000 | 730 | --- | --- | 2.5 | 0.99 | -420 | 5.9 | 210 | 19 | 1.4 |
| SB-2017-01 | SB-2017-01-82-84 | 82 | 84 | 08/30/2017 | 220 | 10 | 10 | 280 | 55,000 | 2,600 | --- | --- | 6.5 | 0.97 | -100 | 6.8 | 360 | 12 | 1.8 |
| SB-2017-01 | SB-2017-01-92-94 | 92 | 94 | 08/31/2017 | 280 | 11 | 6.3 | 2,100 | 26,000 | 7,700 | --- | --- | 2.6 | 0.99 | -420 | 5.9 | 210 | 19 | 1.4 |
| SB-2017-01 | SB-2017-01-98-100 | 98 | 100 | 08/31/2017 | 270 | 11 | 6.1 | 3,100 | 37,000 | 7,100 | --- | --- | 4.4 | 0.99 | -420 | 5.9 | 210 | 19 | 1.4 |
| SB-2017-02 | SB-2017-02-102-104 | 102 | 1044 | 09/11/2017 | 280 | 18 | 3.2 | 2,400 | 65,000 | 8,900 | --- | --- | 2.7 | 0.47 | -120 | 5.6 | 460 | 10 | 3.0 |
| SB-2017-02 | SB-2017-02-111-113 | 111 | 113 | 09/11/2017 | 270 | 18 | 2.2 | 800 | 53,000 | 5,200 | --- | --- | 2.6 | 0.47 | -120 | 5.6 | 460 | 10 | 3.0 |
| SB-2017-02 | SB-2017-02-22-24 | 22 | 24 | 09/06/2017 | 63 | 6.2 | 4.5 J | 5.8 | 25 J | 1.8 J | --- | --- | 1.5 | 3.2 | -120 | 7.1 | 200 | 12 | 6.4 |
| SB-2017-02 | SB-2017-02-32-34 | 32 | 34 | 09/07/2017 | 21 | 3.6 | 4.0 J | 0.87 J | 61 J | 51 | --- | --- | 1.1 | 0.81 | -110 | 5.9 | 69 | 11 | 1.2 |
| SB-2017-02 | SB-2017-02-42-44 | 42 | 44 | 09/07/2017 | 35 | 6.7 | 9.0 | 0.77 J | 1,400 | 110 | --- | --- | 1.8 | 0.81 | -110 | 5.9 | 69 | 11 | 1.2 |
| SB-2017-02 | SB-2017-02-52-54 | 52 | 54 | 09/07/2017 | 56 | 47 | 4.8 J | 6.3 | 7,100 | 690 | --- | --- | 3.2 | 0.81 | -110 | 5.9 | 69 | 11 | 1.2 |
| SB-2017-02 | SB-2017-02-62-64 | 62 | 64 | 09/07/2017 | 69 | 28 | 1.7 J | 11 | 14,000 J | 640 J | --- | --- | 3.6 | 0.81 | -110 | 5.9 | 69 | 11 | 1.2 |
| SB-2017-02 | SB-2017-02-72-74 | 72 | 74 | 09/07/2017 | 78 | 5.8 | 6.8 | 19 | 16,000 | 830 | --- | --- | 1.4 | 0.81 | -110 | 5.9 | 69 | 11 | 1.2 |
| SB-2017-02 | SB-2017-02-82-84 | 82 | 84 | 09/11/2017 | 210 | 18 | 1.6 | 190 J | 71,000 | 3,700 | --- | --- | 2.7 | 0.47 | -120 | 5.6 | 460 | 10 | 3.0 |
| SB-2017-02 | SB-2017-02-92-94 | 92 | 94 | 09/11/2017 | 260 | 19 | 1.8 | 1,800 | 63,000 | 3,800 | --- | --- | 3.0 | 0.47 | -120 | 5.6 | 460 | 10 | 3.0 |
| SB-2017-03 | SB-2017-03-102-104 | 102 | 104 | 09/05/2017 | 300 | 19 | 3.6 J | 5.7 | 9,100 | 9,900 | --- | --- | 2.3 | 0.19 | -73 | 6.6 | 450 | 14 | 2.9 |
| SB-2017-03 | SB-2017-03-22-24 | 22 | 24 | 08/31/2017 | 37 | 2.7 | 3.7 | 1.5 U | 24 J | 24 | --- | --- | 0.16 U | 2.8 | 220 | 6.8 | 72 | 11 | 3.7 |
| SB-2017-03 | SB-2017-03-32-34 | 32 | 34 | 08/31/2017 | 40 | 14 | 14 | 9.3 | 840 | 36 | --- | --- | 2.9 | 2.8 | 220 | 6.8 | 72 | 11 | 3.7 |
| SB-2017-03 | SB-2017-03-42-44 | 42 | 44 | 09/01/2017 | 41 | 37 | 8.4 | 1.7 J | 5,200 | 300 | --- | --- | 3.7 | 0.33 | 43 | 6.7 | 100 | 10 | 3.9 |
| SB-2017-03 | SB-2017-03-52-54 | 52 | 54 | 09/01/2017 | 53 | 14 | 3.7 | 5.8 | 8,200 | 390 | --- | --- | 4.1 | 0.33 | 43 | 6.7 | 100 | 10 | 3.9 |
| SB-2017-03 | SB-2017-03-62-64 | 62 | 44 | 09/01/2017 | 63 | 17 | 3.3 | 13 | 8,300 | 560 | --- | --- | 3.1 | 0.33 | 43 | 6.7 | 100 | 10 | 3.9 |
| SB-2017-03 | SB-2017-03-72-74 | 72 | 74 | 09/01/2017 | 73 | 4.7 | 6.0 | 86 | 21,000 | 2,100 | --- | --- | 1.6 | 0.33 | 43 | 6.7 | 100 | 10 | 3.9 |
| SB-2017-03 | SB-2017-03-82-84 | 82 | 84 | 09/05/2017 | 200 | 15 | 2.5 J | 170 | 46,000 | 3,800 | --- | --- | 2.8 | 0.19 | -73 | 6.6 | 450 | 14 | 2.9 |
| SB-2017-03 | SB-2017-03-92-94 | 92 | 94 | 09/05/2017 | 270 | 21 | 2.1 J | 960 | 55,000 | 9,600 | --- | --- | 2.2 | 0.19 | -73 | 6.6 | 450 | 14 | 2.9 |
| SB-2017-04 | SB-2017-04-102-104 | 102 | 104 | 09/06/2017 | 290 | 17 | 3.0 J | 2,900 | 40,000 | 1,700 | --- | --- | 2.6 | 1.4 | -170 | 7.6 | 960 | 11 | 2.5 |
| SB-2017-04 | SB-2017-04-108-110 | 108 | 110 | 09/06/2017 | 280 | 17 | 3.8 J | 800 | 30,000 | 5,300 | --- | --- | 2.5 | 1.4 | -170 | 7.6 | 960 | 11 | 2.5 |
| SB-2017-04 | SB-2017-04-22-24 | 22 | 24 | 08/31/2017 | 9.9 | 2.7 | 3.4 | 1.9 J | 43 J | 25 | --- | --- | 0.16 U | 9.5 | -290 | 7.5 | 51 | 17 | 2.7 |
| SB-2017-04 | SB-2017-04-32-34 | 32 | 34 | 09/01/2017 | 30 | 1.1 | 2.8 | 2.7 J | 17 U | 26 | --- | --- | 1.5 | 3.2 | -97 | 7.0 | 120 | 9.4 | 2.7 |
| SB-2017-04 | SB-2017-04-42-44 | 42 | 44 | 09/01/2017 | 36 | 11 | 1.6 | 1.5 U | 3,200 | 390 | --- | --- | 0.16 U | 3.2 | -97 | 7.0 | 120 | 9.4 | 2.7 |
| SB-2017-04 | SB-2017-04-52-54 | 52 | 54 | 09/01/2017 | 45 | 3.0 | 3.6 J | 1.8 J | 1,600 J | 300 J | --- | --- | 2.6 | 3.2 | -97 | 7.0 | 120 | 9.4 | 2.7 |
| SB-2017-04 | SB-2017-04-62-64 | 62 | 64 | 09/05/2017 | 57 | 16 | 2.5 J | 10 | 5,400 | 320 | --- | --- | 2.2 | 1.8 | -96 | 6.1 | 180 | 12 | 3.0 |
| SB-2017-04 | SB-2017-04-72-74 | 72 | 74 | 09/05/2017 | 48 | 23 | 6.6 | 38 | 18,000 | 860 | --- | --- | 1.3 | 1.8 | -96 | 6.1 | 180 | 12 | 3.0 |
| SB-2017-04 | SB-2017-04-82-84 | 82 | 84 | 09/05/2017 | 53 | 12 | 5.5 | 100 | 22,000 | 1,000 | --- | --- | 1.7 | 1.8 | -96 | 6.1 | 180 | 12 | 3.0 |
| SB-2017-04 | SB-2017-04-92-94 | 92 | 94 | 09/05/2017 | 270 | 18 | 2.6 J | 1,200 | 55,000 | 3,700 | --- | --- | 3.2 | 1.8 | -96 | 6.1 | 180 | 12 | 3.0 |
| SB-2017-05 | SB-2017-05-102-104 | 102 | 104 | 09/11/2017 | 250 | 17 | 3.4 | 630 | 70,000 | 7,500 | --- | --- | 2.4 | 0.49 | -74 | 6.3 | 360 | 13 | 0.57 |
| SB-2017-05 | SB-2017-05-112-114 | 112 | 114 | 09/12/2017 | 310 | 16 | 3.5 | 1,100 | 34,000 | 12,000 | --- | --- | 2.4 | 1.3 | -92 | 7.1 | 670 | 12 | 2.3 |
| SB-2017-05 | SB-2017-05-22-24 | 22 | 24 | 09/07/2017 | 56 | 22 | 2.9 J | 1.6 J | 350 | 210 | --- | --- | 8.2 | 6.5 | 140 | 5.8 | 62 | 17 | 2.3 |
| SB-2017-05 | SB-2017-05-32-34 | 32 | 34 | 09/07/2017 | 20 | 2.0 J | 2.5 J | 3.8 J | 1,700 | 95 | --- | --- | 2.4 | 6.5 | 140 | 5.8 | 62 | 17 | 2.3 |
| SB-2017-05 | SB-2017-05-42-44 | 42 | 44 | 09/08/2017 | 49 | 31 | 3.4 J | 1.1 J | 4,100 | 400 | --- | --- | 2.1 | 0.75 | -110 | 6.3 | 140 | 11 | 0.70 |
| SB-2017-05 | SB-2017-05-52-54 | 52 | 54 | 09/08/2017 | 45 | 15 | 5.6 | 9.7 | 6,600 | 380 | --- | --- | 2.9 | 0.75 | -110 | 6.3 | 140 | 11 | 0.70 |
| SB-2017-05 | SB-2017-05-62-64 | 62 | 64 | 09/08/2017 | 51 | 2.0 J | 4.5 J | 25 | 11,000 | 300 | --- | --- | 2.2 | 0.75 | -110 | 6.3 | 140 | 11 | 0.70 |
| SB-2017-05 | SB-2017-05-72-74 | 72 | 74 | 09/08/2017 | 100 | 4.9 | 5.1 | 82 | 30,000 | 1,400 | --- | --- | 2.5 | 0.75 | -110 | 6.3 | 140 | 11 | 0.70 |
| SB-2017-05 | SB-2017-05-82-84 | 82 | 84 | 09/11/2017 | 170 | 14 | 2.8 | 260 | 52,000 | 3,100 | --- | --- | 2.7 | 0.49 | -74 | 6.3 | 360 | 13 | 0.57 |
| SB-2017-05 | SB-2017-05-92-94 | 92 | 94 | 09/11/2017 | 250 | 19 | 4.8 | 2,500 | 64,000 | 3,600 | --- | --- | 2.5 | 0.49 | -74 | 6.3 | 360 | 13 | 0.57 |
| SB-2017-06 | SB-2017-06-35-37 | 35 | 37 | 08/17/2017 | 25 | 2.3 | 3.2 | 1.5 U | 620 | 490 | --- | --- | 0.78 J | 55 | 180 | 5.9 | 55 | 14 | 4.5 |
| SB-2017-06 | SB-2017-06-45-47 | 45 | 47 | 08/17/2017 | 52 | 1.4 | 3.0 | 1.5 U | 17 U | 1,500 J | --- | --- | 1.3 | 55 | 180 | 5.9 | 55 | 14 | 4.5 |
| SB-2017-06 | SB-2017-06-55-57A | 55 | 57 | 08/31/2017 | 42 | 2.3 | 4.9 | 3.6 | 39 J | 100 | --- | --- | 1.3 | 55 | 240 | 7.9 | 55 | 18 | 4.5 |
| SB-2017-06 | SB-2017-06-62-64 | 62 | 64 | 08/21/2017 | 21 | 1.9 | 4.3 | 18 | 41 J | 340 | --- | --- | 0.82 J | 58 | 250 | 7.4 | 58 | 17 | 3.9 |
| SB-2017-07 | SB-2017-07-25-27 | 25 | 27 | 08/15/2017 | 33 | 1.2 | 3.4 | 15 | 7,300 | 1,900 | --- | --- | 1.4 | 0.34 | 110 | 5.9 | 84 | 16 | 0.77 |
| SB-2017-07 | SB-2017-07-35-37 | 35 | 37 | 08/15/2017 | 62 | 1.0 | 4.6 | 1.5 U | 500 | 2,700 | --- | --- | 1.5 | 0.34 | 110 | 5.9 | 84 | 16 | 0.77 |
| SB-2017-07 | SB-2017-07-45-47 | 45 | 47 | 08/15/2017 | 79 | 1.1 | 1.8 | 33 | 6,800 | 1,500 | --- | --- | 1.1 | 0.34 | 110 | 5.9 | 84 | 16 | 0.77 |
| SB-2017-07 | SB-2017-07-55-57 | 55 | 57 | 08/16/2017 | 77 | 1.6 | 2.9 | 270 | 51,000 | 2,700 | --- | --- | 1.6 | 0.23 | -50 | 6.2 | 140 | 16 | 1.4 |
| SB-2017-07 | SB-2017-07-65-67 | 65 | 67 | 08/16/2017 | 45 | 1.4 | 5.1 | 3,000 | 30,000 | 1,800 | --- | --- | 0.75 J | 0.23 | -50 | 6.2 | 140 | 16 | 1.4 |
| SB-2017-07 | SB-2017-07-75-77 | 75 | 77 | 08/16/2017 | 85 | 2.4 | 6.8 | 400 | 4,300 | 2,700 | --- | --- | 0.64 J | 0.23 | -50 | 6.2 | 140 | 16 | 1.4 |

**Former Fort Devens**
**2017 Vertical Profile Sampling Results**
Historical Long Term Monitoring Data
Former Fort Devens, Long Term Monitoring

| | | | | Analytical Method | GENCHEM | | | Metals | | | pH | SW9040 | SW9060 | Field Parameters | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte | Alkalinity, Total (as CaCO3) | Chloride | Sulfate | Arsenic | Iron | Manganese | pH | pH | Dissolved Organic Carbon | Dissolved Oxygen | Oxidation Reduction | pH | Specific Conductivity | Temperature | Turbidity |
| | | | | Units | mg/L | mg/L | mg/L | µg/L | µg/L | µg/L | pH Units | pH Units | mg/L | mg/L | mv | pH Units | µS/cm | °C | NTU |
| Location | Sample ID | SBD | SED | Date | | | | 10* | 9,100* | 1,715* | | | | | | | | | |
| SB-2017-08 | SB-2017-08-27-29 | 27 | 29 | 08/21/2017 | 570 | 16 | 0.40 U | 14 | 20,000 | 920 | --- | --- | 21 | 0.32 | 9.4 | 6.9 | 480 | 15 | 2.2 |
| SB-2017-08 | SB-2017-08-37-39 | 37 | 39 | 08/21/2017 | 270 | 6.2 | 0.40 U | 220 | 90,000 | 1,700 | --- | --- | 6.3 | 0.32 | 9.4 | 6.9 | 480 | 15 | 2.2 |
| SB-2017-08 | SB-2017-08-47-49 | 47 | 49 | 08/21/2017 | 240 | 5.7 | 0.50 J | 890 J | 73,000 J | 2,400 J | --- | --- | 5.1 | 0.32 | 9.4 | 6.9 | 480 | 15 | 2.2 |
| SB-2017-08 | SB-2017-08-57-59 | 57 | 59 | 08/22/2017 | 220 | 8.4 | 2.7 | 5,200 | 110,000 | 3,400 | --- | --- | 3.2 | 0.23 | -67 | 6.8 | 490 | 16 | 5.9 |
| SB-2017-08 | SB-2017-08-67-69 | 67 | 69 | 08/22/2017 | 230 | 17 | 3.7 | 3,500 | 110,000 | 1,200 | --- | --- | 3.4 | 0.23 | -67 | 6.8 | 490 | 16 | 5.9 |
| SB-2017-08 | SB-2017-08-77-79 | 77 | 79 | 08/22/2017 | 250 | 15 | 8.4 | 5,700 | 76,000 | 1,300 | --- | --- | 3.6 | 0.23 | -67 | 6.8 | 490 | 16 | 5.9 |
| SB-2017-08 | SB-2017-08-87-89 | 87 | 89 | 08/22/2017 | 230 | 13 | 7.1 | 6,500 | 48,000 | 2,400 | --- | --- | 3.0 | 0.23 | -67 | 6.8 | 490 | 16 | 5.9 |
| SB-2017-08 | SB-2017-08-94.6-96.6 | 94.6 | 96.6 | 08/23/2017 | 240 | 11 | 6.7 | 7,600 | 33,000 | 6,000 | --- | --- | 2.8 | 0.43 | -49 | 7.3 | 490 | 17 | 3.8 |
| SB-2017-09 | SB-2017-09-22-24 | 22 | 24 | 08/23/2017 | 430 | 17 | 0.40 U | 24 | 21,000 | 850 | --- | --- | 19 | 0.18 | -12 | 6.9 | 320 | 15 | 4.2 |
| SB-2017-09 | SB-2017-09-32-34 | 32 | 34 | 08/23/2017 | 140 | 6.9 | 8.8 | 82 | 29,000 | 1,600 | --- | --- | 6.9 | 0.18 | -12 | 6.9 | 320 | 15 | 4.2 |
| SB-2017-09 | SB-2017-09-42-44 | 42 | 44 | 08/23/2017 | 360 | 31 | 0.44 J | 120 J | 60,000 | 5,600 | --- | --- | 6.8 | 0.18 | -12 | 6.9 | 320 | 15 | 4.2 |
| SB-2017-09 | SB-2017-09-52-54 | 52 | 54 | 08/24/2017 | 450 | 38 | 2.5 | 140 | 72,000 | 3,200 | --- | --- | 8.5 | 0.25 | -39 | 7.1 | 560 | 4.4 | 5.6 |
| SB-2017-09 | SB-2017-09-62-64 | 62 | 64 | 08/24/2017 | 240 | 22 | 9.6 | 900 | 98,000 | 1,900 | --- | --- | 3.3 | 0.25 | -39 | 7.1 | 560 | 4.4 | 5.6 |
| SB-2017-10 | SB-2017-10-22-24 | 22 | 24 | 08/24/2017 | 360 | 21 | 0.40 U | 10 | 26,000 | 1,300 | --- | --- | 21 | 0.23 | 47 | 6.8 | 640 | 14 | 6.5 |
| SB-2017-10 | SB-2017-10-32-34 | 32 | 34 | 08/25/2017 | 79 | 2.5 | 5.0 | 87 | 18,000 | 830 | --- | --- | 5.2 | 0.23 | -41 | 6.8 | 170 | 12 | 4.9 |
| SB-2017-10 | SB-2017-10-42-44 | 42 | 44 | 08/25/2017 | 270 | 17 | 5.0 | 25 | 75,000 | 2,400 | --- | --- | 7.6 | 0.23 | -41 | 6.8 | 170 | 12 | 4.9 |
| SB-2017-10 | SB-2017-10-52-54 | 52 | 54 | 08/25/2017 | 250 | 45 | 4.9 | 33 | 15,000 | 4,800 | --- | --- | 4.8 | 0.23 | -41 | 6.8 | 170 | 12 | 4.9 |
| SB-2017-10 | SB-2017-10-62-64 | 62 | 64 | 08/25/2017 | 120 | 24 | 19 | 1,600 | 75,000 | 670 | --- | --- | 2.3 | 0.23 | -41 | 6.8 | 170 | 12 | 4.9 |
| SB-2017-10 | SB-2017-10-72-74 | 72 | 74 | 08/25/2017 | 180 | 22 | 14 | 2,500 | 48,000 | 5,600 | --- | --- | 2.8 | 0.23 | -41 | 6.8 | 170 | 12 | 4.9 |
| SB-2017-11 | SB-2017-11-22-24 | 22 | 24 | 08/28/2017 | 26 | 0.52 | 3.3 | 62 | 15,000 | 840 | 6.9 | --- | 2.6 | 0.98 | -79 | 1.8 | 99 | 13 | 1.9 |
| SB-2017-11 | SB-2017-11-32-34 | 32 | 34 | 08/28/2017 | 35 | 1.5 | 3.8 | 160 | 20,000 | 2,100 | 6.9 | --- | 1.9 | 0.98 | -79 | 1.8 | 99 | 13 | 1.9 |
| SB-2017-11 | SB-2017-11-42-44 | 42 | 44 | 08/28/2017 | 110 | 6.8 | 5.9 | 63 J | 29,000 | 590 | 7.0 | --- | 3.0 | 0.98 | -79 | 1.8 | 99 | 13 | 1.9 |
| SB-2017-11 | SB-2017-11-52-54 | 52 | 54 | 08/28/2017 | 290 | 27 | 1.5 | 160 | 71,000 | 3,500 | --- | --- | 5.0 | 0.98 | -79 | 1.8 | 99 | 13 | 1.9 |
| SB-2017-11 | SB-2017-11-62-64 | 62 | 64 | 08/29/2017 | 250 | 16 | 0.55 J | 430 | 98,000 | 990 | --- | --- | 3.5 | 0.99 | -97 | 6.7 | 420 | 11 | 3.0 |
| SB-2017-11 | SB-2017-11-72-74 | 72 | 74 | 08/29/2017 | 180 | 23 | 16 | 1,900 | 60,000 | 1,500 | --- | --- | 2.2 | 0.99 | -97 | 6.7 | 420 | 11 | 3.0 |
| SB-2017-12 | SB-2017-12-42-44 | 42 | 44 | 08/28/2017 | 53 | 1.2 | 7.9 | 5.3 | 7,800 | 5,400 | --- | --- | 1.1 | 0.55 | 30 | 6.7 | 100 | 12 | 3.5 |
| SB-2017-12 | SB-2017-12-52-54 | 52 | 54 | 08/28/2017 | 64 | 4.2 | 6.0 | 90 | 21,000 | 2,300 | --- | --- | 1.3 | 0.55 | 30 | 6.7 | 100 | 12 | 3.5 |
| SB-2017-12 | SB-2017-12-62-64 | 62 | 64 | 08/28/2017 | 110 | 13 | 3.3 | 110 | 34,000 | 1,300 | --- | --- | 2.6 | 0.55 | 30 | 6.7 | 100 | 12 | 3.5 |
| SB-2017-12 | SB-2017-12-72-74 | 72 | 74 | 08/29/2017 | 120 | 14 | 3.9 | 87 | 39,000 | 1,700 | --- | --- | 2.3 | 0.42 | -3.7 | 6.9 | 270 | 13 | 4.3 |
| SB-2017-12 | SB-2017-12-82-84 | 82 | 84 | 08/29/2017 | 210 | 23 | 1.3 | 5.1 | 5,900 | 16,000 | --- | --- | 2.1 | 0.42 | -3.7 | 6.9 | 270 | 13 | 4.3 |
| SB-2017-12 | SB-2017-12-92-94 | 92 | 94 | 08/29/2017 | 220 | 32 | 5.2 | 18 | 13,000 | 12,000 | --- | --- | 3.0 | 0.42 | -3.7 | 6.9 | 270 | 13 | 4.3 |
| SB-2017-12 | SB-2017-12-99-101 | 99 | 101 | 08/30/2017 | 280 | 35 | 7.9 | 5.1 | 960 | 15,000 | --- | --- | 3.7 | 4.9 | 220 | 7.5 | 410 | 15 | 4.1 |
| SB-2017-13 | SB-2017-13-22-24 | 22 | 24 | 09/15/2017 | 24 | 130 | 9.9 | 1.5 J | 120 | 86 | --- | --- | 0.58 J | 0.29 | 120 | 6.0 | 61 | 17 | 0.87 |
| SB-2017-13 | SB-2017-13-32-34 | 32 | 34 | 09/15/2017 | 3.2 U | 340 | 5.3 | 3.0 U | 870 | 160 | --- | --- | 0.50 J | 0.29 | 120 | 6.0 | 61 | 17 | 0.87 |
| SB-2017-13 | SB-2017-13-41-43 | 41 | 43 | 09/15/2017 | 24 | 6.5 | 2.7 | 3.7 | 3,700 | 1,100 | --- | --- | 0.64 J | 0.29 | 120 | 6.0 | 61 | 17 | 0.87 |
| SB-2017-13 | SB-2017-DUP-09 | 22 | 24 | 09/15/2017 | 23 | 130 | 9.8 | 3.0 U | 120 | 90 | --- | --- | 1.1 J | 0.29 | 120 | 6.0 | 61 | 17 | 0.87 |
| SB-2017-13 | SB-2017-DUP-10 | 32 | 34 | 09/15/2017 | 3.2 U | 340 | 5.2 | 3.0 U | 880 | 160 | --- | --- | 0.49 | 0.29 | 120 | 6.0 | 61 | 17 | 0.87 |
| SB-2017-14 | SB-2017-14-22-24 | 22 | 24 | 09/14/2017 | 44 | 39 | 3.1 | 2,000 | 28,000 | 1,500 | --- | --- | 2.0 | 0.25 | -31 | 6.0 | 86 | 17 | 0.89 |
| SB-2017-14 | SB-2017-14-32-34 | 32 | 34 | 09/14/2017 | 43 | 4.7 | 3.6 | 490 | 5,500 | 1,700 | --- | --- | 1.6 | 0.25 | -31 | 6.0 | 86 | 17 | 0.89 |
| SB-2017-15 | SB-2017-15-22-24 | 22 | 24 | 09/14/2017 | 51 | 85 | 8.6 | 550 | 29,000 | 4,800 | --- | --- | 1.1 | 0.24 | -49 | 6.7 | 210 | 15 | 2.7 |
| SB-2017-15 | SB-2017-15-32-34 | 32 | 34 | 09/14/2017 | 84 | 12 | 3.5 | 1,300 | 31,000 | 850 | --- | --- | 1.8 | 0.24 | -49 | 6.7 | 210 | 15 | 2.7 |
| SB-2017-15 | SB-2017-15-37-39 | 37 | 39 | 09/14/2017 | 210 | 17 | 2.5 | 2,100 | 53,000 | 1,500 | --- | --- | 3.3 | 0.24 | -49 | 6.7 | 210 | 15 | 2.7 |
| SB-2017-16 | SB-2017-16-22-24 | 22 | 24 | 09/13/2017 | 75 | 240 | 10 | 440 | 17,000 | 470 | --- | --- | 2.7 | 0.13 | -160 | 7.1 | 400 | 15 | 5.9 |
| SB-2017-16 | SB-2017-16-32-34 | 32 | 34 | 09/13/2017 | 86 | 76 | 2.5 | 260 | 3,500 | 570 | --- | 7.9 | 3.4 | 0.13 | -160 | 7.1 | 400 | 15 | 5.9 |
| SB-2017-16 | SB-2017-16-42-44 | 42 | 44 | 09/14/2017 | 91 | 4.7 | 3.4 | 420 | 32,000 | 980 | --- | 7.2 | 1.7 | 0.58 | -140 | 3.4 | 290 | 15 | 0.61 |
| SB-2017-16 | SB-2017-16-52-54 | 52 | 54 | 09/14/2017 | 190 | 15 | 2.8 | 1,300 | 41,000 | 1,400 | --- | 7.3 | 2.1 | 0.58 | -140 | 3.4 | 290 | 15 | 0.61 |
| SB-2017-16 | SB-2017-16-62-64 | 62 | 64 | 09/14/2017 | 380 | 140 | 4.0 | 1.7 J | 5,300 | 7,300 | --- | 7.7 | 3.1 | 0.58 | -140 | 3.4 | 290 | 15 | 0.61 |
| SB-2017-17 | SB-2017-17-12-14 | 12 | 14 | 09/12/2017 | 23 | 13 | 8.2 | 1.5 U | 4,800 | 1,600 | --- | --- | 2.6 | 0.34 | 100 | 4.8 | 120 | 13 | 1.3 |
| SB-2017-17 | SB-2017-17-22-24 | 22 | 24 | 09/12/2017 | 35 | 7.8 | 10 | 1.5 U | 1,600 | 420 | --- | --- | 0.46 J | 0.34 | 100 | 4.8 | 120 | 13 | 1.3 |
| SB-2017-17 | SB-2017-17-32-34 | 32 | 34 | 09/12/2017 | 29 | 420 | 5.6 | 1.5 U | 2,600 | 660 | --- | --- | 0.71 J | 0.34 | 100 | 4.8 | 120 | 13 | 1.3 |
| SB-2017-17 | SB-2017-17-42-44 | 42 | 44 | 09/12/2017 | 37 | 490 | 12 | 10 | 3,900 | 710 | --- | --- | 0.91 J | 0.34 | 100 | 4.8 | 120 | 13 | 1.3 |
| SB-2017-17 | SB-2017-17-52-54 | 52 | 54 | 09/12/2017 | 54 | 970 | 15 | 57 | 10,000 | 860 | --- | --- | 1.3 | 0.34 | 100 | 4.8 | 120 | 13 | 1.3 |
| SB-2017-17 | SB-2017-17-62-64 | 62 | 64 | 09/13/2017 | 92 | 69 | 4.3 | 140 J | 34,000 | 1,500 J | --- | --- | 1.3 | 0.80 | -110 | 6.0 | 410 | 11 | 2.6 |
| SB-2017-17 | SB-2017-17-72-74 | 72 | 74 | 09/13/2017 | 190 | 27 | 2.8 | 520 | 80,000 | 3,100 | --- | --- | 2.9 | 0.80 | -110 | 6.0 | 410 | 11 | 2.6 |
| SB-2017-17 | SB-2017-17-78-80 | 78 | 80 | 09/13/2017 | 310 | 35 | 4.7 | 93 | 36,000 | 5,100 | --- | --- | 3.1 | 0.80 | -110 | 6.0 | 410 | 11 | 2.6 |
| SB-2017-18 | SB-2017-18-12-14 | 12 | 14 | 09/12/2017 | 15 | 20 | 9.3 | 1.5 U | 630 | 2,800 | --- | --- | 1.3 | 0.61 | -2.9 | 6.0 | 88 | 11 | 2.0 |
| SB-2017-18 | SB-2017-18-22-24 | 22 | 24 | 09/12/2017 | 12 | 18 | 9.0 | 1.5 U | 570 | 1,900 | --- | --- | 1.1 | 0.61 | -2.9 | 6.0 | 88 | 11 | 2.0 |
| SB-2017-18 | SB-2017-18-32-34 | 32 | 34 | 09/12/2017 | 27 | 4.6 | 11 | 1.5 U | 1,500 J | 1,100 | --- | --- | 1.4 | 0.61 | -2.9 | 6.0 | 88 | 11 | 2.0 |

**Former Fort Devens**
**2017 Vertical Profile Sampling Results**
Historical Long Term Monitoring Data
Former Fort Devens, Long Term Monitoring

| | | | | Analytical Method | GENCHEM | | | Metals | | | pH | SW9040 | SW9060 | Field Parameters | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte | Alkalinity, Total (as CaCO3) | Chloride | Sulfate | Arsenic | Iron | Manganese | pH | pH | Dissolved Organic Carbon | Dissolved Oxygen | Oxidation Reduction | pH | Specific Conductivity | Temperature | Turbidity |
| | | | | Units | mg/L | mg/L | mg/L | µg/L | µg/L | µg/L | pH Units | pH Units | mg/L | mg/L | mv | pH Units | µS/cm | °C | NTU |
| **Location** | **Sample ID** | **SBD** | **SED** | **Date** | | | | **10*** | **9,100*** | **1,715*** | | | | | | | | | |
| SB-2017-18 | SB-2017-18-42-44 | 42 | 44 | 09/12/2017 | **46** | **3.8** | **6.7** | 1.5 U | **930** | **690** | --- | --- | **0.94 J** | 0.61 | -2.9 | 6.0 | 88 | 11 | 2.0 |
| SB-2017-18 | SB-2017-18-52-54 | 52 | 54 | 09/13/2017 | **58** | **4.1** | **6.9** | **1.8 J** | **5,500** | **1,200** | --- | --- | **1.5** | 0.29 | -72 | 6.1 | 110 | 13 | 1.1 |
| SB-2017-18 | SB-2017-18-62-64 | 62 | 64 | 09/13/2017 | **140** | **21** | **2.8** | **200** | **45,000** | **1,400** | --- | --- | **1.6** | 0.29 | -72 | 6.1 | 110 | 13 | 1.1 |
| SB-2017-18 | SB-2017-18-72-74 | 72 | 74 | 09/13/2017 | **200** | **17** | **4.3** | **250** | **44,000** | **1,600** | --- | --- | **2.2** | 0.29 | -72 | 6.1 | 110 | 13 | 1.1 |
| SB-2017-18 | SB-2017-18-82-84 | 82 | 84 | 09/13/2017 | **290** | **22** | **2.4** | **94** | **41,000** | **7,600** | --- | --- | **3.0** | 0.29 | -72 | 6.1 | 110 | 13 | 1.1 |
| SB-2017-18 | SB-2017-18-91-93 | 91 | 93 | 09/13/2017 | **420** | **40** | **7.5** | **1.7 J** | **15,000** | **4,100** | --- | --- | **3.5** | 0.29 | -72 | 6.1 | 110 | 13 | 1.1 |

**Notes:**

| | |
|---|---|
| *Screening Limits: | SHL Cleanup Goals |
| Screening Limits Source: | EPA Superfund Record of Decision for Shepley's Hill Landfill, Fort Devens MA 1995 |
| SBD | Sample Beginning Depth (ft) |
| SED | Sample Ending Depth (ft) |
| mg/L | Milligrams per Liter |
| µg/L | Micrograms per Liter |
| pH Units | pH Units |
| mv | Millivolts |
| µS/cm | Microsiemens per Centimeter |
| °C | Degrees Celsius |
| NTU | Nephelometric Turbidity Units |

**Analytical Parameters**

| | |
|---|---|
| # | =Detection |
| # | =Above Cleanup Goal |

**Qualifiers**

| | |
|---|---|
| J | The analyte was positively identified, the quantitation is an estimation. |
| U | The analyte was analyzed for, but not detected. The associated numerical value is at or below the MDL. |

# Attachment 9

**Response to Comments**

**Response to Comments**
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| 1 | David Chaffin | Section 3 | Screen elevations in some of the piezometers and wells in the triangles used for 3PE analysis differ by more than 10 feet (Table 1). Considering the vertical gradients near the extraction wells (Table 2), do these elevation differences affect the 3PE analyses significantly? | The screen elevations do not significantly affect the 3PE analyses. Variations in the hydraulic conductivity within the glacial deposits do not vary significantly, and no definitive confining layers or clay lenses have been identified within the formation that significantly alter hydraulic heads. Hydraulic head differences at well pairs are slightly outside the influence of pumping (within hundredths of a foot difference), further supporting the lack of any substantial confining or semi-confining condition above the screens of the wells used in the 3PE analysis. |
| 2 | David Chaffin | Section 4.1.2 | Arsenic concentrations, like iron and manganese concentrations, are redox indicators at this site. Consequently, arsenic concentrations should also be noted in the subsections presented here to characterize redox conditions. | Although arsenic dynamics at SHL are directly influenced by geochemical redox conditions, the arsenic concentrations are not a direct indicator or metric of the redox conditions themselves. Specifically, although arsenic is redox active (and may be present in the +III or +V oxidation state), arsenic is not a major redox couple governing the redox potential of the solution, whereas oxygen, iron, and manganese are.<br><br>Arsenic concentrations relative to the other redox indicators are described in detail in Section 4.2. To provide clarity, the following text has been added to the first paragraph of Section 4.1.2: "Although arsenic itself may be indirectly considered a redox indicator parameter, arsenic distribution relative to the primary groundwater redox indicators described in this section is discussed in more detail in Section 4.2." |
| 3 | David Chaffin | Section 4.1.2.6 | Elevated manganese concentrations in samples collected from wells SHM-13-03 and SHM-13-15 appear to be attributable to the landfill, rather than some other source. Consistent with the redox zonation expected downgradient of a landfill, these elevated manganese concentrations appear at the fringe of the arsenic plume where weaker manganese reducing conditions become dominant (Figure 22). A similar zone occurs in the nearfield area east of wells SHM-96-5B and SHM-93-22B. | The text in this section has been modified to acknowledge that although manganese concentrations are higher at this downgradient fringe than upgradient, the reducing condition influencing these manganese concentrations are most likely still associated with the landfill. |
| 4 | David Chaffin | Section 4.2.1 | Parts of the discussion of “geogenic” arsenic sources implying that bedrock beneath Shepley’s Hill contributes significantly to the elevated arsenic concentrations in groundwater at the site are speculative. While local bedrock may be the source of arsenic bound in metal hydroxides and solid precipitates in the unconsolidated overburden materials and bedrock fractures, site data indicate that elevated concentrations of arsenic in overburden and bedrock groundwater at the site are attributable primarily to landfilling and capping the landfill. These actions created the reducing conditions that mobilize arsenic from the overburden solids and bedrock fractures into the overburden and bedrock groundwater: | The term "significant" used in this context is subjective. Because it is not the goal of this memorandum to quantify the proportion of dissolved arsenic derived from the bedrock, the language in this section was modified (including removal of the word "significant") to describe the strong possibility that arsenic- containing pyrite oxidation in bedrock is one potential original source to the dissolved arsenic observed in groundwater. |
| 4a | David Chaffin | Section 4.2.1 | •Shepley’s Hill may not overlie the Ayer Granite Formation (e.g., Kopera, 2006). | The text has been revised to state that SHL overlies the Devens Gneiss Complex. |
| 4b | David Chaffin | Section 4.2.1 | •The contribution of oxidative dissolution of arsenic-bearing minerals in Shepley’s Hill bedrock to current arsenic concentrations in site groundwater is not likely to be significant. As noted in the memo, the highest arsenic concentration reported in a groundwater sample collected from bedrock beneath Shepley’s Hill was 570 ug/L, far below the concentrations reported in samples collected within and downgradient of the landfill, and the representativeness of this sample is questionable - a closer review of this result would be necessary to confirm that it is not attributable to a disturbance of local redox conditions (e.g., fresh bedrock exposed by drilling, interconnected fractures conveying reduced water to metal precipitates on borehole walls, infiltration of landfill groundwater, etc.). While previous studies have identified oxidative dissolution as a process that can mobilize arsenic from bedrock minerals, they have not determined where this process is active at present or the magnitude of the resulting impacts to groundwater. Relatively undisturbed conditions on Shepley’s Hill suggest the current extent of active oxidative dissolution in underlying bedrock is very limited. | The text in this section states that higher concentrations (up to 4,700 ug/L) were observed in bedrock well N5-P1. It is true that higher concentrations are observed associated with reducing conditions in the overburden; however, the point is that the bedrock groundwater is a potential contributor to the overall arsenic load, not the source of the highest observed concentrations. Further, it is not the goal of this memorandum to quantify the specific proportion of arsenic derived from bedrock. The language in Section 4.2.1 has been modified to acknowledge this possibility, rather than speaking to the "significance" of this contribution. |

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| 4c | David Chaffin | Section 4.2.1 | •Arsenic trends in NIA wells sampled between landfill capping and extraction system start-up show that arsenic concentrations increased substantially after the landfill was capped. At well SHM-93-22B, concentrations increased from less than 500 ug/L in 1996 to more than 3,500 ug/L in 2006 (e.g., refer to trend graphs in the 2019 Annual Report). At well SHM-96-5B, concentrations increased from less than 1,500 ug/L in 1996 to more than 4,000 ug/L in 2000 (these trends were reversed after the extraction system was activated in 2006). | Comment noted. |
| 4d | David Chaffin | Section 4.2.1 | •The suggested connection between Shepley's Hill and high arsenic concentrations in groundwater along the bedrock slope and near the overburden-bedrock contact is speculative. The 1,000 ug/L arsenic contour shown in Figure 22 matches the footprint of a former wetland area (e.g., 1939 Ayer topographic map), indicating that the elevated arsenic concentrations are more likely attributable to reducing conditions induced by a buried wetland containing peat deposits rich in carbon and overlying buried waste. | Some portions of the 1,000 µg/L arsenic area on Figure 22 overlap with former wetland areas shown on the 1939 Ayer topographic map. The text has been updated to mention the former wetland area as contributing to reducing conditions. In cross section (Figure 24), peat attributed to the wetlands and landfill waste are depicted as being shallower than the highest arsenic concentrations that the overburden-bedrock contact that are discussed in this section. Please note that Figure 22 is now Figure 24 and Figure 24 is now Figure 26. |
| 4e | David Chaffin | Section 4.2.1 | •The suggested association between groundwater recharge from Shepley's Hill and elevated arsenic concentrations in deep overburden and bedrock groundwater is speculative. As shown in Figure 24, high arsenic concentrations found in deeper overburden in the 2017 soil borings appear to be attributable to the landfill; the deep overburden in these borings intercepts flow paths that descend from the landfill, where the strongest reducing conditions and highest arsenic concentrations occur, to the lower part of the overburden aquifer as the overburden aquifer thickens going downgradient, a common occurrence at numerous Devens cleanup sites. | The last sentence under the 2017 Investigations bullet was removed.<br>The response to comment 22 notes that there is a seasonal aspect to groundwater recharge and gradients from the bedrock to the overburden. The text has been modified to indicate seasonal variability. |
| 5 | David Chaffin | Section 4.2.2.1 | The suggestion that elevated arsenic concentrations in bedrock wells are attributable to oxidative dissolution of Shepley's Hill bedrock is speculative. Bedrock at these locations could have been infiltrated by landfill-impacted groundwater from upgradient areas (e.g., refer to Spring and Fall 2019 groundwater elevation maps). | The text in this section has been modified for clarity. The suggestion is that release of arsenic due to oxidative dissolution of minerals present in the bedrock as a contributing geogenic source is "consistent" with the low iron condition, therefore merely stating that geogenic arsenic in the bedrock is possible. |
| 6 | David Chaffin | Section 4.2.2.5 | The suggestion that elevated arsenic concentrations in deep overburden in the nearfield area bedrock wells are attributable to oxidative dissolution of Shepley's Hill bedrock is speculative. As shown in Figure 24, deep overburden in the nearfield area is located downgradient of the part of the landfill where the strongest reducing conditions and highest arsenic concentrations exist – the data indicate that the arsenic migrated from the landfill area, not Shepley's Hill. | Section 4.2.2.5 does not discuss elevated arsenic concentrations due to oxidative dissolution of Shepley's Hill bedrock. This section specifically discusses groundwater moving north "from beneath the landfill", and indicates that arsenic concentrations are greater at depth, where groundwater conditions are more reducing. |
| 7 | David Chaffin | Section 5, final paragraph | While the presence of bound arsenic in bedrock, till, and overburden can be attributed to oxidative dissolution in the distant past, site data indicate that the distribution of dissolved arsenic in groundwater is currently controlled by reducing conditions attributable to landfilling and capping. | The text in this section is not inconsistent with this statement. "Geogenic" in this context is referring to arsenic derived from the reduction of naturally-present iron oxide coatings (as well as possibly including oxidation of arsenic sulfides in bedrock). The paragraph goes on to state that "Groundwater within the landfill footprint and immediately downgradient... are consistent with what would be expected below a landfill with an impermeable cap and indicative of active reductive dissolution of arsenic, iron, and manganese." No change to the text was made in response to this comment. |
| 8 | David Chaffin | Table 1 | Table 1 should include data from all wells used for 3PE analysis, including SHM-10-06 and SHM-10-06A. | Table 1 has been updated to include data from all wells used for the 3PE analyses. |
| 9 | David Chaffin | Figure 4 | Well SHM-93-22B appears to be located favorably for capture zone analysis – was there a particular reason for not using it as a triangle well? | SHM-93-22B had some erroneous water level measurements throughout the analysis period and was thus not used as part of the 3PE analyses. |

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| 10 | David Chaffin | Figures 19 and 20 | The inferred average extent of the spring and fall capture zones appear to larger on the east side of the capture zone than indicated by the data presented in the figures. The downgradient limit of the capture zone should divide 3PE vectors that point north from those that point south. Consequently in Figure 19, the limit of the capture zone could be located at the boundary of Triangles 13 and 15 and traced upgradient along flowlines west of piezometer EPA-PZ-2012-3B. Similarly in Figure 20, the limit of the capture zone could cross the center of Triangle 15, where flow is due west, and be traced upgradient along flowlines through piezometer EPA-PZ-2012-3B (e.g., see orange lines added to the attached figures). The differences between what is indicated and what was inferred appear to be significant. Comparing Fall 2020 arsenic concentrations at wells SHM-10-06 (1,000 ug/L) and SHM-10-06A (71 ug/L) suggests that capture to the inferred limit could reduce arsenic concentrations in groundwater bypassing the extraction wells to less than 100 ug/L; whereas, capture to the indicated limit could allow arsenic concentrations bypassing the extraction wells at 1,000 ug/L or higher | Due to the relatively shallow groundwater gradients for some of the triangles, there is uncertainty regarding the extent of the capture zones. The capture zones depicted in the figures is an approximation based on the direction and pattern of the hydraulic gradient arrows, and is subject to minor variations due to the relatively low hydraulic gradients throughout this area of the site. The arsenic trends in monitoring wells will be evaluated as part of the Task 5, Subtask 5.e. Technical Memorandum and the extents of the capture zones may be minorly adjusted. |
| 11 | David Chaffin | Figures 19 and 20 | Neither inferred capture zone extends far enough to capture arsenic intercepted by wells SHM-96-5B (As = 720 ug/L) and SHM-93-22B (As = 300 ug/L), indicating that a portion of the plume east of the extraction wells was not captured. | The estimated capture zones represent the average conditions for Spring and Fall 2016-2020. There may be certain conditions where those areas may be captured. It should be noted that hydraulic gradients estimated from 3PE analysis represents only one line of evidence, and is not necessarily a definitive representation of capture zone on its own, particularly when represented by shallow gradients. |
| 12 | David Chaffin | Figures 19 and 20 | The boundary of the west side of the capture zone cannot be located accurately with the information presented in the figures. There are no flow vectors along the western boundary (it appears that data from EPA-PZ-2012-6B, EPA-PZ-2012-7B, and SHP-2016-4B could be used to construct a 3PE triangle) and upgradient well SHP-2016-06B, unlike all the other piezometers and wells presented in these figures, was screened in bedrock, making comparisons with measurements from other wells and piezometers questionable. | An additional 3PE triangle has been added for EPA-PZ-2012-6B, EPA-PZ-2012-7B and SHP-2016-4B will be added to better define the western boundary of the estimated capture zone. |
| 13 | David Chaffin | Figures 19 and 20 | The inferred average limits of the capture zone are based on hydraulic data only; apparently, geochemical data were not considered as implied by the title and objective of the work presented in the memo. However, the geochemical data presented in the report (e.g., Figure 22) indicate that the capture zone is not large enough to capture the full extent of dissolved arsenic exiting the landfill. | The landfill boundary has been added to Figures 19 and 20 to assist in showing the extent of the capture zones relative to the SHL boundary. |
| 14 | David Chaffin | Figures 19 and 20 | As acknowledged in Section 5.0, the inferred extents of the average spring and fall capture zones shown here are inconclusive regarding the actual extent of capture during the period 2016 - 2020. Consequently, these results do not resolve questions about the portion of the arsenic plume that escaped capture east and west of the extraction wells during 2016 - 2020. | As stated in response to comment 12, an additional 3PE triangle has been added to better define the western boundary of the estimated capture zone. To help quantify the actual capture extent for certain time periods, estimated capture zones for discrete time periods have been evaluated (see comment 16). |
| 15 | EPA | General | Capture zones were estimated for average spring and fall conditions using data provided by EPA/ORD in addition to water level measurements made by the Army under the long-term monitoring program. It appears that the spring average (Figure 19) may have utilized at least one partial data set (May 18, 2020) in which water levels were not measured in several of wells. Use of partial data sets when averaging hydraulic heads for vector calculation or generation of potentiometric surfaces may introduce temporal artifacts. It is recommended that only complete data sets be used to obtain the averages. | Full data sets were used for all other time periods used in the 3PE analysis, with the exception of May 18, 2020. |
| 16 | EPA | General | Although average capture zones for spring and fall data sets are useful in providing context, the capture zone should be estimated for each monitoring event for which there is sufficient high-quality data. Seasonal averages mute the differences in the capture zone that occur due to differences in precipitation, groundwater elevation, hydraulic gradients, and other factors. For example, the text states that the average spring capture zone is only slightly smaller than the average fall capture zone. However, as observed in Figures 6 and 11 of the memorandum and in Figure A below, the hydraulic gradient vectors calculated using high-quality data obtained on October 20, 2016, and May 13, 2019, indicate that the differences in the capture zones on those dates were likely more significant. Given sufficient monitoring events, it may be possible to roughly correlate the size of the capture envelope with variables such as groundwater elevation and/or precipitation. | A select number of data sets (two or three) have been used to compare the average fall and spring capture zones to discrete times (such as October 20, 2016 and May 13, 2019). |

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| 17 | EPA | Page 8, Section 3, Observed Groundwater Gradient Vectors | The method used to create the average potentiometric surfaces in Figures 19 and 20 is unclear. EPA requests that the methodology used to create these average surfaces and the average vectors be described in detail. It is noted that the numerical average of the groundwater elevations measured at well SHP-2016-4B on March 2, 2017; May 22, 2018; May 13, 2019; and May 18, 2020, is 212.50. However, this well is plotted on the 212.00 contour line in Figure 19. A similar result is obtained for other wells leading to a lack of clarity in the process used to produce these results. | Page 8 of the text describes the process: "The average groundwater contours were generated by taking an average of all the spring events only and all the fall events only (using Surfer). The average groundwater hydraulic gradient arrows were similarly obtained by taking an average of all the 3PE generated hydraulic gradients for spring events only and fall events only. The groundwater capture zone was estimated based on following the inferred flow lines from the groundwater elevation contours and the 3PE hydraulic gradient vectors." Additional description regarding the averaging of the potentiometric surface grids (using surfer) have been added to the text. |
| 18 | EPA | Page 9, Section 4.1.1, Summary of Geochemical Data Collected During Previous Investigations, 1st Bullet | Historical monitoring data collected during the Remedial Investigation (Geology and Environment, 1993a; Geology and Environment, 1993b) and as part of the Long-Term Monitoring (LTM) program has documented that groundwater within a significant portion of the overburden aquifer has always flowed to the north into the Northern Impact Area (NIA). Operation of the extraction wells has served to enhance the rate of groundwater flow to the north for the portion of the overburden aquifer under their influence. Installation of the barrier wall immediately west of Red Cove (Plow Shop Pond) redirected to the north a portion of the overburden groundwater flow that formerly discharged into the pond. The second sentence in paragraph 2) indicates that the northern flow direction of groundwater under the landfill is a result of installation of the extraction wells and the barrier wall. Please revise this statement to clarify. | The statement has been clarified to indicate that the northerly flow direction is not a result of the installation of the extraction wells and barrier wall but is the primary flow direction regardless of the wall and wells. |
| 19 | EPA | Pages 10-12, Section 4.1.2, 2020 Redox Conditions | A summary is provided to illustrate the spatial distribution of redox conditions across various hydrogeologic and monitoring zones for the site. These summary descriptions should also address sulfate concentrations, along with relevance to likely geochemical processes suspected of controlling concentration patterns of this constituent. Ultimately, inferences about potential hydrologic connections between monitoring locations will need to be supported by constituent concentration patterns that have a rational technical basis. Sulfate is an important indicator of redox conditions and statements concerning the relative contribution of sulfide mineral weathering to arsenic concentration patterns need to align with relevant geochemical reaction processes. Please revise this section to address this information gap. | Section 4.1.2 was revised to include a summary of sulfate concentrations and observations relative to redox conditions and potential arsenic sources. |
| 20 | EPA | Page 10, Section 4.1.2, 2020 Redox Conditions | The graphical summary of concentration distributions as a function of depth and lateral distance presented in Figure 24 provides useful context. However, this graphic does not include data for landfill monitoring location SHM-10-12. Please incorporate this location in the cross-section to provide a more complete picture of chemical distributions through the overburden (see Graph 2 below). (It is also recommended that the screened interval elevations for extraction wells EW-01 and EW-04 be added to Figures 23 and 24 to provide spatial context between groundwater metal concentrations and the origin of the apparent capture zone.) In addition, the apparent head drop in the water table elevation between locations SHM-10-15 and SHM-10-14 is not consistent with historical groundwater elevation data for these locations. It appears that one of these locations is incorrect, either due to measurement error and/or calculation error. Please add measured depth to water (or groundwater elevation) data to Table 4 to facilitate review of potential data quality issues. | SHM-10-12 has been added to the north-south cross-section on Figure 24. The screened interval and location of extraction wells EW-04 and EW-01 have been projected onto Figure 23 and Figure 24 to provide context for the origin of the estimated capture zones.<br><br>Groundwater elevations have been added to Table 4. |

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| 21 | EPA | Pages 13-14, Section 4.2.1, Summary of Arsenic Data Collected During Previous Investigations | The investigation conducted during 2010 (Sovereign, 2011) was the first comprehensive attempt to delineate relationships between aquifer solids and groundwater concentrations within the aquifer underlying SHL. Field-based observations of lithologic characteristics and laboratory-based assessments of metal concentrations in aquifer solids indicated variability in metal contents, with some boring samples showing a relationship between iron and arsenic content that was consistent with arsenic associated with iron oxides. Any presumed geochemical reaction controlling arsenic mobilization should be supported by chemical mass balance principles that provide a rationale connection between aquifer solids and groundwater. As shown in Graph 1 below, for monitoring locations within the landfill, there is a strong relationship between the concentration of arsenic in aquifer solids (Sovereign, 2011) and currently observed groundwater arsenic concentrations (top panel). However, attributing the release of arsenic into groundwater solely due to reductive dissolution of iron oxides and associated arsenic is not definitively supported (bottom panel). The arsenic observed in aquifer solids is likely derived from a combination of natural and landfill-derived sources over the time preceding and during active landfill operations. Ultimately, the most critical piece of information is that the geochemical conditions imposed by the landfill closure design do not appear to be improving in a manner that will lead to declines in the sustained mobility and transport of arsenic in groundwater within the landfill. | Section 4.2.1 summarizes landfill soil sample results that indicate it is a source of arsenic to groundwater and the Summary and Conclusions section notes that sources of dissolved arsenic in groundwater include anthropogenic (landfill) and geogenic sources. No changes to the text were made in response to this comment. |
| 22 | EPA | Page 14, Section 4.2.1, Summary of Arsenic Data Collected During Previous Investigations | Statements concerning geogenic contributions of arsenic to aquifer solids throughout the saturated thickness are referenced to "upward groundwater flow" within the landfill footprint. As documented in the recently revised groundwater flow model for SHL, bedrock inflow accounts for approximately 19 percent and lateral inflow within overburden accounts for approximately 53 percent of the water budget within the landfill (Geosyntec, 2020). There are also locations within the landfill footprint in which the highest arsenic concentration observed during vertical profile sampling was closer to the contact between the disposal cell and the overburden aquifer and/or not the closest interval at the bedrock-overburden contact (see Graph 2 below). Please revise the statements in this section to reflect the current state of knowledge relative to groundwater flow underneath the landfill. Again, the most critical piece of information is that the geochemical conditions imposed by the landfill closure design do not appear to be improving in a manner that will lead to declines in the sustained mobility and transport of arsenic in groundwater within the landfill, regardless of geogenic/anthropogenic origin. | The updated groundwater model report (Geosyntec, 2020) stated the following in Section 3 (Hydrogeologic Framework):<br>• "Groundwater beneath the landfill primarily originates from precipitation recharge on Shepley's Hill that flows within the bedrock fracture network toward the east and discharges upward to the overburden beneath the low-permeability landfill cap. The cap limits direct recharge over a large area of the overburden aquifer, making the bedrock pathway from Shepley's Hill an important component of the overall water balance in the overburden relative to precapping conditions (Gannett Fleming 2012). Groundwater beneath the central and northern portion of the landfill generally flows northward within the thick saturated overburden sands that lie within the northwest trending bedrock valley toward Nonacoicus Brook (see Figure 1.2)."<br>• "Continuous water level monitoring data from 2007 to 2010 in bedrock and overburden wells N5-P1 and N5-P2 located within the landfill footprint (Figure 1.2) indicate seasonal changes in the direction of the vertical gradient at that location (Gannett Fleming 2012). In periods of high recharge and low evapotranspiration (generally winter/spring), the direction of groundwater flow, primarily derived from precipitation recharge on Shepley's Hill, is reported to be upward from the bedrock to the overburden beneath the landfill. In periods of low recharge and high evapotranspiration (generally summer/fall), the direction of groundwater flow is reported to be downward from the overburden sands to the underlying bedrock but with a lower gradient than is associated with the upward flows observed in the winter/spring. The long-term average head difference indicates a net upward discharge of bedrock groundwater to overburden (Gannett Fleming 2012)."<br><br>This indicates there are times during the year that groundwater flow is upward from the bedrock to the overburden. The text has been updated to indicate the seasonality of upward bedrock flow. |
| 23 | EPA | Pages 15-17, Section 4.2.2, 2020 Arsenic Distribution | Consistent with the comment concerning adequate summary of redox conditions, inferences of presumed sources of arsenic in groundwater also need to account for associated patterns in sulfate concentrations for the various hydrogeologic zones addressed in this section. Please revise this section to address this information gap. | The presence of sulfate in upgradient and bedrock monitoring wells is one line of evidence that a potential source of arsenic may be oxidation of naturally occurring arsenic-bearing sulfide minerals. However, in the reducing conditions beneath and downgradient of the landfill, sulfate may be reduced and not act conservatively. Therefore, sulfate concentrations in monitoring wells beneath and downgradient of the landfill is not a reliable indicator of the source of arsenic. Ultimately, the memorandum acknowledges that sources of arsenic to the system include anthropogenic and geogenic sources and that arsenic is primarily mobilized through the reducing conditions caused by the landfill. A summary of sulfate concentrations is included in Section 4.1. Section 4.2 was revised to include sulfate results where it elucidates potential arsenic sources. |

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| 24 | EPA | Figures 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 19 and 20 | The figures use data from well SHP-2016-06B. This well is installed in bedrock rather than the alluvial aquifer and is deeper than most of the surrounding wells used to create the potentiometric surfaces. Given that flow within the alluvial aquifer is of primary concern in this analysis, data from well SHL-23 should be used in the creation of the potentiometric surfaces. These figures should be recreated using these data instead of data from well SHP-2016-06B. | SHL-23 is screened 23 to 33 ft bgs, whereas most of the monitoring wells used in the 3PE analysis are screened much deeper. The screen depth of SHP-2016-06B is located at an elevation that is more representative of the depth of glacial deposits downslope/downgradient of this portion of the site. The use of SHP-2016-06B was intended to represent the higher hydraulic potential southwest of the extraction system along the bedrock slope created by Shepley's Hill. The higher hydraulic potential within the bedrock versus the shallow wells in this area of the site supports a flow potential from the fractured bedrock aquifer across the bedrock/overburden interface into the glacial aquifer. The potentiometric surface presented in the figures reflect this potential for flow. It should be noted that the potentiometric surface in this portion of the site does not impact the results of the 3PE analysis presented in the technical memorandum, and, therefore, does not impact the interpretation of the capture zone downgradient of the ATP extraction wells. |
| 25 | EPA | Figures 6 and 11 | See General Comment 2 [RTC matrix comment 16] above. | See response above |
| 26 | EPA | Figure 10 | As previously noted in comments regarding the 2018 SHL annual report, the groundwater elevation reported for well SHP-2016-02B appears to be erroneous and results in anomalies in the potentiometric surface and vectors calculated using 3PE. These data are likely the result of a mismeasurement and should not be used in hydraulic gradient calculations. It is also noted that the vector pattern in triangles 13, 15, 18, 20, and 21 appears to be suspect and may also be the result of mis-measurement(s). | The groundwater elevations for SHP-2016-02B ranged from 209.66 to 212.95 ft during the August 2016 through November 2020 time period. The groundwater elevation measured at SHP-2016-02 was 212.73 ft for November 1, 2018 (Figure 10). This elevation falls within the historical range in groundwater elevations. |
| 27 | EPA | Figure 12 | Based on historical data, groundwater elevations posted for wells SHP-2016-02B and SHM-05-42B appear to be erroneous and should not be used in the creation of the potentiometric surface or hydraulic gradient calculations. It is noted that a high-quality EPA/ORD data set obtained on October 24, 2019, was previously provided and may be a more representative choice for this exercise. | To maintain consistency with the other water levels collected, groundwater elevations used in the 3PE analysis at SHP-2016-02B and SHM-05-42B were from October 22, 2019. The groundwater elevations for those two wells collected on October 24, 2019 were approximately 1 foot higher (210.73 ft for SHP-2016-02B and 210.85 ft for SHM-05-42B) than the water levels collected on October 22, 2019. |
| 28 | EPA | Figure 14 | Groundwater elevation data for wells SHM-10-06/SHM-10-06A appear to be in error. Historically, groundwater elevation at well SHM-10-06 is lower than at well SHM-10-06A. This likely indicates at least one of the elevations at these two wells was either mis-measured or the measurements are attributed to the wrong wells. Unless the error is found and corrected, the groundwater elevation data from these wells should not be used in the creation of the potentiometric surface or hydraulic gradient calculations. | The groundwater elevation data at SHM-10-06 and SHM-10-06A were not in error. The well depth was measured at each well along with the groundwater elevation to ensure the correct well was used. (The well depth for SHM-10-06 is approximately 80 ft bgs and the well depth for SHM-10-06A is approximately 90 ft bgs). Historically, the groundwater elevation at SHM-10-06 was higher than at SHM-10-06A for several events. |
| 29 | EPA | Figure 19 | See General Comment 1 [RTC matrix comment 15] above. | See response above |
| 30 | EPA | Figures 19 and 20 | See Page-Specific Comment 1 [RTC matrix comment 17] above. | See response above |
| 31 | EPA | Figures 23 and 24 | See Page-Specific Comment 4 [RTC matrix comment 20] above. | See response above |