United States Army Corps of Engineers
New England District

Final
Phase I USEPA SOW – Demonstrate Plume Capture
Technical Memorandum Phase I Subtask 2.d Delineate Lateral and Vertical Extent Upgradient

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

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Final Technical Memorandum – Phase I Subtask 2.d

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
Army	United States Department of the Army
CL	cleanup level
CSM	conceptual site model
Geosyntec	Geosyntec Consultants, Inc.
KGS	KOMAN Government Solutions, LLC
ORP	oxidation-reduction potential
S-A JV	SERES-Arcadis 8(a) Joint Venture 2, LLC
SHL	Shepley's Hill Landfill
site	Area of Contamination 5 – Shepley's Hill Landfill located at the former Fort Devens Army Installation in Devens, Massachusetts
SOW	scope of work
Technical Memo 1	Technical Memorandum – Phase I Subtask 1.g
Technical Memo 2	Technical Memorandum – Phase I Subtask 2.d
USEPA	United States Environmental Protection Agency

1 Introduction

SERES-Arcadis 8(a) Joint Venture 2, LLC (S-A JV) prepared this Technical Memorandum – Phase I Subtask 2.d (Technical Memo 2) in accordance with a scope of work (SOW) developed and agreed to between the United States Department of the Army (Army) and the United States Environmental Protection Agency (USEPA), Region 1, for the Area of Contamination 5 Shepley's Hill Landfill (SHL) site (the site) located at the former Fort Devens Army Installation in Devens, Massachusetts (Figure 1). Technical Memo 2, listed as Phase I Subtask 2.d in the USEPA SOW, is the second of five memoranda being developed in accordance with the SOW (USEPA 2016). The S-A JV prepared this Technical Memo 2 on behalf of the United States Army Corps of Engineers – New England District, under contract number W912WJ-19-D-0014.

Building on the foundation outlined in Phase I EPA SOW – Demonstrate Plume Capture Technical Memorandum Phase I Subtask 1.g Delineate Capture Zone based on Hydraulic and Geochemical Data (Technical Memo 1; S-A JV, 2021), the purpose of Technical Memo 2 is to describe the data collection activities performed to delineate the vertical and lateral extent of groundwater exceeding the cleanup level (CL) of 10 (micrograms per liter) µg/L for arsenic directly upgradient of extraction wells EW-01 and EW-04. The additional work was separated into the subtasks outlined below:

- Conduct Geoprobe® vertical groundwater profile sampling at seven locations along a transect of monitoring wells from SHL-23 to SHL-21 upgradient of the extraction system. (Complete)
- Advance Geoprobe® borings to refusal and collect groundwater samples at 10-foot intervals; sample acquisition and analysis will follow methods in Section 4.0 of the Long-Term Monitoring and Maintenance Plan Update for the site (Sovereign Consulting, Inc. 2015). (Complete)
- Submit a Technical Memorandum (Technical Memo 2) that includes data from the seven vertical profile locations and a map of the vertical and horizontal extent of groundwater exceeding the CL for dissolved arsenic upgradient of the extraction wells based on these data and other relevant previously collected data.
- Compare the extent of dissolved arsenic exceeding the CL upgradient of the extraction wells to the mapped capture zone determined in Technical Memo 1 (S-A JV, 2021).

These activities are summarized in Sections 2 through 4 below.

2 Geoprobe® Profile Sampling Results for Groundwater

In 2016 and 2017, KOMAN Government Solutions, LLC (KGS) performed field investigation activities as required by the SOW (USEPA 2016). Phase I of the 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 whether the remedy is operating as intended. This work included groundwater 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 north impact area. The focus of this Technical Memo 2 is the nature and extent of arsenic upgradient of the extraction wells, along the 2017 Geoprobe® transect that included vertical profile borings SB-2017-06 through SB-2017-12.

2.1 2017 Groundwater Vertical Profile Sample Collection Procedure

In 2017 a Geoprobe® (rig model #7822) equipped with direct-push capabilities and temporary screen points was used to conduct discrete groundwater sampling along the seven vertical profile borings (Figure 2). Each sample was collected over a 2-foot segment, at the bottom of every 10 feet of depth. Sampling was conducted from ground surface to refusal. The tooling used for this event was the Geoprobe® Screen Point 16 (SP16) Sampler (1.5-inch outer diameter x 0.625-inch inner diameter) or the Geoprobe® Screen Point 22 (SP22) Sampler (2.25-inch outer diameter x 1.5-inch inner diameter). The sampler used at each location was determined in the field based on the progress of the direct-push rig, because the smaller diameter sampler was difficult to push at some depths and locations. Both samplers contained a disposable polyvinyl chloride 10-slot (0.010-inch) slotted screen and expendable drive points.

Once the screen point sampler was pushed to depth, the sample acquisition and analysis was conducted consistent with the SOW (USEPA 2016) and the 2017 Work Plan, Shepley's Hill Landfill, Supplemental Investigation to Demonstrate Plume Capture (KGS 2017). Variable speed peristaltic pumps with dedicated tubing were used to collect samples during vertical profiling below the water table from the center of the screen point sampler. The objectives and methods for this procedure are described in USEPA's guidance document, Low Stress (Low-Flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells (USEPA 2010). Flow rates of 0.1 to 0.5 liter per minute were used; however, this was dependent on site-specific hydrogeology (USEPA 2010).

Groundwater profile samples were field-filtered using a 0.45-micron filter for analysis of dissolved arsenic, iron, and manganese, dissolved organic carbon, chloride, sulfate, and alkalinity. Combinations of in-line filters (1-, 5-, 10-micron pore size) were attached to the outlet of the sample tubing before connecting to the flow cell to avoid damage to the flow cell electrodes from the high levels of turbidity typically encountered during sampling from temporary profile screens. Field measurements including dissolved oxygen, temperature, pH, oxidation-reduction potential (ORP), and specific conductance were collected before sample acquisition. Metals results (arsenic, iron, and manganese) are provided in Table 1 and Attachment 1 provides the low-flow purge data.

3 Groundwater Data Used to Map the Vertical and Horizontal Extent of Arsenic Upgradient of the Extraction Wells

3.1 2017 Groundwater Vertical Profile Sampling Results

Concentrations of arsenic in the groundwater profile samples upgradient of extraction wells EW-01 and EW-04 between monitoring wells SHL-23 and SHL-21 ranged from non-detect (limit of detection of 1.5 µg/L) to a maximum of 7,600 µg/L in vertical profile boring SB-2017-08 (Table 1). 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 -3.7 to -89 millivolts (Attachment 1 and Table 1). Correspondingly, at most locations, higher arsenic concentrations were located at greater depths. The presence of higher arsenic concentrations at greater depths in the overburden correlates with the potential sources of geogenic arsenic described in Technical Memo 1 (S-A JV, 2021), which likely includes a combination of arsenic naturally released from bedrock due to oxidative dissolution of sulfide minerals, as well as arsenic released from overburden due to reductive dissolution of oxyhydroxide minerals resulting from natural and landfill-derived organic carbon. Dissolved arsenic concentrations in groundwater at these locations are tabulated in Table 1.

3.2 2016 to 2020 Monitoring Well Groundwater Sampling Results

Dissolved arsenic concentrations for monitoring wells shown on Figure 2 that are also located along the same approximate west-to-east transect as the 2017 investigation locations described above (SB-2017-06 to SB-2017-12) were evaluated from 2016 through 2020. These data are included in Table 2 and summarized below:

- Dissolved arsenic concentrations ranged from 280 to 2,800 µg/L at monitoring well SHP-2016-06A.
- The dissolved arsenic concentration at location SHM-10-06 exhibited a general decreasing trend, with concentrations ranging from 1,700 µg/L in fall 2016 to 1,000 µg/L in fall 2020.
- The dissolved arsenic concentration in monitoring wells SHP-2016-06B (ranging from 830 to 1,300 µg/L), SHP-2016-06C (ranging from 210 to 350 µg/L), SHM-23 (ranging from not detected at the limit of detection of 1.5 µg/L to 3 µg/L), and SHM-10-06A (ranging from 63 to 76 µg/L) were relatively consistent from 2016 to 2020. SHP-2016-06B and SHP-2016-06C are screened in the bedrock. SHM-23 and SHM-10-06A are screened in the overburden.

Dissolved arsenic concentration trends will be evaluated further in Technical Memo 5.

3.3 Fall 2020 Groundwater Sampling Results

Dissolved arsenic concentrations for monitoring wells located throughout SHL were evaluated for the most recent sample date (fall 2020) and were used to delineate areas greater than the CL of 10 µg/L. These data are included in Table 3 and Attachments 2 and 3. Dissolved arsenic concentrations in groundwater exceeded the CL of 10

µg/L at 62 of the 110 sampled locations (56%), with the highest concentration of 6,800 µg/L detected in monitoring well SHM-10-15 (located in the Landfill Area).

4 Comparison of Mapped Lateral and Vertical Extent of the Contaminant Plume Upgradient of the Extraction System to Mapped Lateral and Vertical Extent of Plume Capture in Phase I, Task 1 Technical Memorandum

The lateral and vertical spatial distribution of dissolved arsenic in groundwater are presented on Figures 3 and 4, respectively. The lateral spatial distribution of dissolved arsenic in groundwater used the most recent groundwater sample results (fall 2020) for each location to show areas where the dissolved arsenic concentration in groundwater is greater than the CL of 10 µg/L; these results are summarized in Table 3. Similarly, the vertical distribution of dissolved arsenic above the CL is shown using a combination of fall 2020 groundwater monitoring results at monitoring wells along the cross section and 2017 vertical profile sampling results described above in Section 3. Technical Memo 1 Section 4 (S-A JV, 2021) describes the geochemical conditions and arsenic distribution at SHL in more detail.

As described in Technical Memo 1 (S-A JV, 2021), geochemical conditions in SHL overburden groundwater are highly reducing and consistent with reductive dissolution of arsenic. Downgradient (to the north) of the SHL, oxidation-reduction conditions become more variable as oxic meteoric inputs provide recharge to groundwater. Downgradient of the SHL, greater concentrations of dissolved arsenic are observed in deeper groundwater relative to shallow groundwater and overall concentrations are less than within the landfill footprint. Near Nonacoicus Brook, dissolved oxygen 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 an arsenic concentration trend analysis and further discussion on this topic.

The estimated groundwater capture zones delineated based on the results of the three-point estimation (3PE; Beljin, Ross, and Acree 2013) analysis (a three-point solution method used to estimate horizontal hydraulic gradients, estimate groundwater flow directions, and estimate velocity) and the groundwater elevation contours for the average of spring and fall events for 2016 through 2020 described in Technical Memo 1 (Figures 19 and 20 of Technical Memo 1 [S-A JV, 2021]) were compared to the mapped lateral extent of dissolved arsenic upgradient of extraction wells EW-01 and EW-04 shown on Figures 3 and 4. The comparison is shown on Figures 5 and 6. The lateral extent of the estimated capture zones for both average spring and fall conditions captures most of the mobile dissolved arsenic extent between monitoring wells SHL-23 (located adjacent to SHP-2016-06B) and SHM-10-06. The capture zone extents encompass the entire SHL landfill boundary for both average spring and fall conditions. However, there appears to be an area where groundwater is not consistently fully captured on the eastern edge of the landfill between vertical profile boring SB-2017-12 and the eastern-most extent of dissolved arsenic exceeding the CL at monitoring well SHM-10-06A (Figures 5 and 6).

The estimated vertical capture zone for the average of spring and fall monitoring events for 2016 through 2020 were compared to the mapped vertical extent of dissolved arsenic upgradient of extraction wells EW-01 and EW-04. The comparison is shown on Figures 7 and 8. The vertical capture zone extent is based on a review of the vertical hydraulic gradients near extraction wells EW-01 and EW-04 (summarized in Technical Memo 1; S-A JV, 2021), which indicate that the predominant vertical direction of flow is downward within the glacial aquifer, with slight temporal variations when an upward gradient may be present. Many of the calculated vertical gradients presented in Technical Memo 1 are relatively low, with greater than 25% of the vertical gradients less than or equal to 0.001 ft/ft (S-A JV 2021). 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. Therefore, the estimated vertical capture zone likely extends to at least the top of bedrock. The extent of the capture zone into the bedrock is somewhat uncertain as there are seasonal differences in vertical hydraulic gradients between the bedrock and glacial aquifer (the gradient is sometimes upward). The gradient from monitoring well SHP-2016-06A to monitoring well SHP-2016-6B is typically downward and the gradient from monitoring well SHP-2016-6C to monitoring well SHP-2016-6B is typically upward, therefore the estimated vertical extent of the capture zone in the bedrock was set to the bottom of the screen for monitoring well SHP-2016-6B.

5 Summary and Conclusions

The results of the vertical profile locations between monitoring wells SHL-23 and SHL-21 showed that at most locations, higher arsenic concentrations are located at greater depths. The presence of higher arsenic concentrations at greater depths in the overburden correlates with the sources of geogenic arsenic described in Technical Memo 1 (S-A JV, 2021), which likely includes a combination of arsenic naturally released from bedrock due to oxidative dissolution of sulfide minerals, as well as arsenic released from overburden due to reductive dissolution of oxyhydroxide minerals resulting from natural and landfill-derived organic carbon.

The estimated extent of horizontal and vertical extent of capture zones for extraction wells EW-01 and EW-04 were compared to the horizontal and vertical dissolved arsenic extent exceeding the CL between monitoring wells SHL-23 and SHL-21. As shown on Figures 5 and 6, the lateral extent of the estimated capture zones for both average spring and fall conditions included in Technical Memo 1 (S-A JV, 2021), capture the majority of the dissolved arsenic in groundwater exceeding the CL between monitoring wells SHL-23 (located adjacent to SHP-2016-06B) and SHM-10-06. The capture zone extents encompass the entire SHL landfill boundary for both average spring and fall conditions. However, there is an area where groundwater is not fully captured on the eastern side of the capture zone between vertical profile boring SB-2017-12 and the eastern-most extent of dissolved arsenic exceeding the CL of 10 µg/L. As shown on Figures 7 and 8, the vertical extent of capture zones for both average spring and fall conditions captures most of the groundwater with dissolved arsenic above the CL of 10 µg/L in both the overburden (glacial aquifer) and extending into the upper reaches of bedrock.

6 References

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USEPA. 2016. Letter from Lynn A. Jennings (USEPA) to William O'Donnell (Army) re: Former Fort Devens Installation – Dispute Resolution, 2015 Devens Five Year Review (FYR) Report. February 24.

Tables

Table 1. Analytical Results for Geoprobe Profile Locations Between SHL-23 and SHL 21

2021 Technical Memo

Shepley's Hill Landfill, Former Fort Devens Army Installation

Devens, Massachusetts

				Analytical Method	GENCHEM			Metals			pH	SW9060
				Analyte	Alkalinity, Total (as CaCO3)	Chloride	Sulfate	Arsenic	Iron	Manganese	pH	Dissolved Organic Carbon
				Units	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	pH Units	mg/L
Location	Sample ID	SBD	SED	Date				10*	9,100*	1,715*		
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
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
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
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
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
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
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
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
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
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
SB-2017-08	SB-2017-08-27-29	27	29	08/21/2017	570	16	0.40 U	14	20,000	920	---	21
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
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
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
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
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
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
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
SB-2017-09	SB-2017-09-22-24	22	24	08/23/2017	430	17	0.40 U	24	21,000	850	---	19
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
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
SB-2017-09	SB-2017-09-52-54	52	54	08/24/2017	450	38	2.5	140	72,000	3,200	---	8.5
SB-2017-09	SB-2017-09-62-64	62	64	08/24/2017	240	22	9.6	900	98,000	1,900	---	3.3
SB-2017-10	SB-2017-10-22-24	22	24	08/24/2017	360	21	0.40 U	10	26,000	1,300	---	21
SB-2017-10	SB-2017-10-32-34	32	34	08/25/2017	79	2.5	5.0	87	18,000	830	---	5.2
SB-2017-10	SB-2017-10-42-44	42	44	08/25/2017	270	17	5.0	25	75,000	2,400	---	7.6
SB-2017-10	SB-2017-10-52-54	52	54	08/25/2017	250	45	4.9	33	15,000	4,800	---	4.8
SB-2017-10	SB-2017-10-62-64	62	64	08/25/2017	120	24	19	1,600	75,000	670	---	2.3
SB-2017-10	SB-2017-10-72-74	72	74	08/25/2017	180	22	14	2,500	48,000	5,600	---	2.8
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
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
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
SB-2017-11	SB-2017-11-52-54	52	54	08/28/2017	290	27	1.5	160	71,000	3,500	---	5.0
SB-2017-11	SB-2017-11-62-64	62	64	08/29/2017	250	16	0.55 J	430	98,000	990	---	3.5
SB-2017-11	SB-2017-11-72-74	72	74	08/29/2017	180	23	16	1,900	60,000	1,500	---	2.2
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
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
SB-2017-12	SB-2017-12-62-64	62	64	08/28/2017	110	13	3.3	110	34,000	1,300	---	2.6
SB-2017-12	SB-2017-12-72-74	72	74	08/29/2017	120	14	3.9	87	39,000	1,700	---	2.3
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
SB-2017-12	SB-2017-12-92-94	92	94	08/29/2017	220	32	5.2	18	13,000	12,000	---	3.0
SB-2017-12	SB-2017-12-99-101	99	101	08/30/2017	280	35	7.9	5.1	960	15,000	---	3.7

Table 1. Analytical Results for Geoprobe Profile Locations Between SHL-23 and SHL 21

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Shepley's Hill Landfill, Former Fort Devens Army Installation

Devens, Massachusetts

				Field Parameters					
				Dissolved Oxygen	Oxidation Reduction Potential	pH	Specific Conductivity	Temperature	Turbidity
				mg/L	mv	pH Units	µS/cm	°C	NTU
Location	**Sample ID**	**SBD**	**SED**						
SB-2017-06	SB-2017-06-35-37	35	37	55	190	5.9	55	14	4.7
SB-2017-06	SB-2017-06-45-47	45	47	92	180	5.9	92	21	4.5
SB-2017-06	SB-2017-06-55-57A	55	57	55	240	7.9	55	18	4.5
SB-2017-06	SB-2017-06-62-64	62	64	58	250	7.4	58	17	3.9
SB-2017-07	SB-2017-07-25-27	25	27	0.68	130	6.2	84	18	7.9
SB-2017-07	SB-2017-07-35-37	35	37	0.54	220	5.9	120	16	1.1
SB-2017-07	SB-2017-07-45-47	45	47	0.34	110	6.2	160	16	0.77
SB-2017-07	SB-2017-07-55-57	55	57	2.2	-50	6.7	220	20	1.4
SB-2017-07	SB-2017-07-65-67	65	67	0.23	-36	6.4	140	16	6.7
SB-2017-07	SB-2017-07-75-77	75	77	1.2	35	6.2	190	19	12
SB-2017-08	SB-2017-08-27-29	27	29	0.42	110	6.9	950	15	3.9
SB-2017-08	SB-2017-08-37-39	37	39	0.43	9.4	7.6	590	17	11
SB-2017-08	SB-2017-08-47-49	47	49	0.32	24	9.5	480	15	2.2
SB-2017-08	SB-2017-08-57-59	57	59	0.34	-3.6	6.8	490	16	6.3
SB-2017-08	SB-2017-08-67-69	67	69	0.30	-21	7.1	520	17	5.9
SB-2017-08	SB-2017-08-77-79	77	79	0.27	-40	7.0	570	18	7.6
SB-2017-08	SB-2017-08-87-89	87	89	0.23	-67	7.3	520	18	8.9
SB-2017-08	SB-2017-08-94.6-96.6	94.6	96.6	0.43	-49	7.3	490	17	3.8
SB-2017-09	SB-2017-09-22-24	22	24	0.29	34	6.9	720	15	4.2
SB-2017-09	SB-2017-09-32-34	32	34	0.18	22	6.9	320	15	4.9
SB-2017-09	SB-2017-09-42-44	42	44	0.99	-12	7.0	750	16	4.3
SB-2017-09	SB-2017-09-52-54	52	54	0.34	-24	7.2	850	4.4	6.5
SB-2017-09	SB-2017-09-62-64	62	64	0.25	-39	7.1	560	15	5.6
SB-2017-10	SB-2017-10-22-24	22	24	0.23	47	6.8	640	14	6.5
SB-2017-10	SB-2017-10-32-34	32	34	0.26	53	6.9	170	12	5.3
SB-2017-10	SB-2017-10-42-44	42	44	0.42	-8.2	6.9	550	13	5.4
SB-2017-10	SB-2017-10-52-54	52	54	0.23	83	6.9	530	15	6.4
SB-2017-10	SB-2017-10-62-64	62	64	0.31	-41	7.0	410	14	5.2
SB-2017-10	SB-2017-10-72-74	72	74	2.5	-33	6.8	500	19	4.9
SB-2017-11	SB-2017-11-22-24	22	24	7.4	180	2.9	99	21	1.9
SB-2017-11	SB-2017-11-32-34	32	34	2.9	230	1.8	120	17	1.9
SB-2017-11	SB-2017-11-42-44	42	44	0.98	-79	6.8	210	13	3.0
SB-2017-11	SB-2017-11-52-54	52	54	1.9	-69	6.9	580	13	3.1
SB-2017-11	SB-2017-11-62-64	62	64	1.8	-89	6.7	500	11	3.3
SB-2017-11	SB-2017-11-72-74	72	74	0.99	-97	6.9	420	12	3.0
SB-2017-12	SB-2017-12-42-44	42	44	0.55	97	6.8	100	12	3.5
SB-2017-12	SB-2017-12-52-54	52	54	1.6	32	6.7	160	17	4.1
SB-2017-12	SB-2017-12-62-64	62	64	2.0	30	6.9	250	12	8.8
SB-2017-12	SB-2017-12-72-74	72	74	0.61	22	7.0	270	14	4.3
SB-2017-12	SB-2017-12-82-84	82	84	1.1	150	6.9	400	17	4.3
SB-2017-12	SB-2017-12-92-94	92	94	0.42	-3.7	6.9	450	13	8.0
SB-2017-12	SB-2017-12-99-101	99	101	4.9	220	7.5	410	15	4.1

Table 1. Analytical Results for Geoprobe Profile Locations Between SHL-23 and SHL 21

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Shepley's Hill Landfill, Former Fort Devens Army Installation

Devens, Massachusetts

Notes:

*Screening Limits:	SHL Cleanup Goals
Screening Limits Source:	EPA Superfund Record of Decision for Shelpey'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

U	The analyte was analyzed for, but not detected. The associated numerical value is at or below the MDL.
J	The analtye was positively identified, the quantitation is an estimation.

Table 2
Analytical Results/Data from Upgradient Monitoring Wells (2016-2020)
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Devens, Massachusetts

Location	Depth to Top of Screen (Feet BGS)	Depth to Bottom of Screen (Feet BGS)	Sample Date	Dissolved Arsenic (µg/L)
SHL-23	23	33	07/08/2016	1.5 U
			11/22/2016	3 U
			05/24/2017	1.5 U
			11/27/2017	3
			11/08/2018	3 U
			11/13/2019	3 U
			11/12/2020	3 U
SHM-10-06	69.5	79.5	11/21/2016	**1,700**
			11/16/2017	**1,600**
			11/12/2018	**1,200**
			11/01/2019	**1,300**
			11/13/2020	**1,000**
SHM-10-06A	77	87	12/02/2016	**76**
			11/30/2017	**74**
			11/07/2018	**64**
			11/07/2019	**63**
			11/13/2020	**71**
SHP-2016-06A	81	86	06/15/2017	**520**
			11/28/2017	**600**
			04/18/2018	**280**
			11/09/2018	**480**
			04/17/2019	**2,800**
			11/05/2019	**860**
			05/21/2020	**760**
			11/12/2020	**640**
SHP-2016-06B	102	112	06/15/2017	**830 J**
			11/28/2017	**1,300**
			04/18/2018	**1,300**
			11/07/2018	**1,300**
			04/17/2019	**1,300**
			11/05/2019	**1,200**
			05/21/2020	**1,100**
			11/12/2020	**1,100**
SHP-2016-06C	123	133	06/17/2017	**320**
			11/28/2017	**280**
			04/18/2018	**210**
			11/07/2018	**300**
			04/17/2019	**250**
			11/05/2019	**270**
			05/21/2020	**310**
			11/12/2020	**350**

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

Acronyms and Abbreviations:
µg/L microgram per liter
USACE United States Army Corps of Engineers
ft bgs feet below ground surface

Analytical Parameters:
= Above Cleanup Level

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.

Table 3
Analytical Results/Data Included on Figure 3
2021 Technical Memo
Shepley's Hill Landfill, Former Fort Devens Army Installation
Devens, Massachusetts

		Analytical Method	Dissolved Metals		Field Parameters					
		Analyte	Arsenic		DO	ORP	pH	SPC	Temp	Turbidity
		Unit	µg/L		mg/L	mv	SU	µS/cm	°C	NTU
		Screening Limit *	10							
Location	Sample ID	Date								
EPA-PZ-2012-1A	EPA-PZ-2012-1A-FAL20	10/30/2020	3	U	0.78	88.8	6.59	81	7.2	37.2
EPA-PZ-2012-1B	EPA-PZ-2012-1B-FAL20	10/30/2020	**210**		2.95	9.1	6.47	282	7.3	10.2
EPA-PZ-2012-2A	EPA-PZ-2012-2A-FAL20	11/5/2020	3	U	5.79	264	5.55	47	12.4	1.9
EPA-PZ-2012-2B	EPA-PZ-2012-2B-FAL20	11/5/2020	3	U	0.81	54.2	5.93	288	12.4	12.4
EPA-PZ-2012-3A	EPA-PZ-2012-3A-FAL20	11/2/2020	**12**		0.92	223	5.76	195	10.6	8.4
EPA-PZ-2012-3B	EPA-PZ-2012-3B-FAL20	11/2/2020	**2,700**		0.88	131	6.42	311	9.5	35.5
EPA-PZ-2012-4A	EPA-PZ-2012-4A-FAL20	10/30/2020	3.6		0.89	72.4	6.38	431	6.7	8.77
EPA-PZ-2012-4B	EPA-PZ-2012-4B-FAL20	10/29/2020	**2,000**		3.51	5.4	6.46	468	9.1	33.3
EPA-PZ-2012-4B (FD)	SHL-DUP05-FAL20	10/29/2020	**1,900**		--	--	--	--	--	--
EPA-PZ-2012-5A	EPA-PZ-2012-5A-FAL20	11/10/2020	3	U	0.59	103	5.37	81	13.1	12.1
EPA-PZ-2012-5B	EPA-PZ-2012-5B-FAL20	11/10/2020	2.5	J	0.82	74.7	6.17	333	13.2	9.6
EPA-PZ-2012-6A	EPA-PZ-2012-6A-FAL20	11/11/2020	3	U	7.13	65.7	6.4	116	16.8	4.23
EPA-PZ-2012-6B	EPA-PZ-2012-6B-FAL20	11/11/2020	**300**		0.46	-1.6	6.45	150	15.4	2.34
EPA-PZ-2012-7A	EPA-PZ-2012-7A-FAL20	11/6/2020	3	U	4.94	123	7.97	375	12.7	3.24
EPA-PZ-2012-7B	EPA-PZ-2012-7B-FAL20	11/6/2020	**1,300**		0.46	44.4	8.12	145	12.6	3.48
EW-01	EW-01-FAL20	10/30/2020	**1,400**		1.05	96.1	6.5	505	9.9	4.23
EW-04	EW-04-FAL20	10/30/2020	**3,000**		2.11	74.7	6.76	264	6.7	6.18
N5-P1	N5-P1-FAL20	10/30/2020	**520**		0.68	-38.3	6.78	171	9.1	6
PZ-12-01	PZ-12-01-FAL20	11/2/2020	**600**		0.63	10.7	6.81	527	9.2	11.7
PZ-12-02	PZ-12-02-FAL20	11/2/2020	**270**		0.69	-8.5	6.56	621	10.2	1.96
PZ-12-03	PZ-12-03-FAL20	11/2/2020	**720**		0.37	-17.6	6.63	504	8.5	30
PZ-12-04	PZ-12-04-FAL20	11/2/2020	**710**		0.52	-2.3	6.5	572	8.2	24.2
PZ-12-05	PZ-12-05-FAL20	11/3/2020	**140**		0.91	43.8	6.51	277	9.4	3.37
PZ-12-06	PZ-12-06-FAL20	11/3/2020	**13**		0.6	58.9	6.24	243	10.3	3.11
PZ-12-07	PZ-12-07-FAL20	11/5/2020	**110**		3.85	100	7.69	241	12.9	331
PZ-12-08	PZ-12-08-FAL20	11/5/2020	**24**		0.42	89.7	7.49	167	13.6	29.8
PZ-12-09	PZ-12-09-FAL20	10/26/2020	1.6	J	1.39	122	6.99	182	9.8	39.6
PZ-12-10	PZ-12-10-FAL20	10/26/2020	3	U	4.47	165	6.82	71	9.2	2.43
SHL-10	SHL-10-FAL20	11/9/2020	3	U	2.27	120	8.24	44	16.3	1.53
SHL-11	SHL-11-FAL20	10/29/2020	**900**		0.52	21.5	6.53	534	10.6	35.8
SHL-12	SHL-12-FAL20	11/2/2020	2.3	J	2.96	71.3	6.05	247	8.5	6.3
SHL-15	SHL-15-FAL20	11/2/2020	**26**		0.69	-1.4	5.95	161	10.7	12.1
SHL-19	SHL-19-FAL20	10/26/2020	3	U	4.35	142	6.74	178	9.9	15.9
SHL-20	SHL-20-FAL20	10/29/2020	**760**		3.37	17.1	6.45	513	10.4	10.7
SHL-22	SHL-22-FAL20	11/3/2020	2.4	J	1.17	97.8	6.67	352	8.7	2.4
SHL-22 (FD)	SHL-DUP07-FAL20	11/3/2020	2.2	J	--	--	--	--	--	--
SHL-23	SHL-23-FAL20	11/12/2020	3	U	10.1	200	6.52	43	10.6	1.06
SHL-24	SHL-24-FAL20	10/26/2020	3.9		2.66	159	6.97	202	11.4	0.02
SHL-24 (FD)	SHL-DUP09-FAL20	10/26/2020	4.1		--	--	--	--	--	--
SHL-3	SHL-3-FAL20	11/9/2020	3	U	3.91	130	7.58	136	16.1	1.12
SHL-4	SHL-4-FAL20	11/12/2020	**110**		0.8	-17.2	6	147	12.7	65.2
SHL-5	SHL-5-FAL20	11/9/2020	4.6		0.85	92.8	5.77	81	15.1	33.1
SHL-7	SHL-7-FAL20	11/3/2020	3	U	0.79	84.3	5.91	175	9.1	8.9
SHL-8D	SHL-8D-FAL20	11/10/2020	3	U	0.66	89	5.94	154	13.9	2
SHL-8S	SHL-8S-FAL20	11/10/2020	3	U	4.07	163	5.98	66	13.3	2.3
SHL-9	SHL-9-FAL20	11/3/2020	**35**		0.83	3.6	6.52	194	8.7	72.3
SHM-05-39A	SHM-05-39A-FAL20	10/26/2020	7.3		1.71	196	6.28	150	12.1	33.5
SHM-05-39B	SHM-05-39B-FAL20	10/26/2020	**420**		0.77	-70.5	6.91	523	10.8	11.5
SHM-05-40X	SHM-05-40X-FAL20	11/11/2020	**2,100**		0.45	6.4	6.36	403	13.5	11.5
SHM-05-40X (FD)	SHL-DUP10-FAL20	11/11/2020	**2,300**		--	--	--	--	--	--
SHM-05-41A	SHM-05-41A-FAL20	11/6/2020	**18**		0.32	19.8	8.17	104	11.8	6.25
SHM-05-41B	SHM-05-41B-FAL20	11/6/2020	**570**		0.46	7.9	7.67	423	11.4	5.51
SHM-05-41C	SHM-05-41C-FAL20	11/6/2020	**610**		0.54	-19.9	7.58	1,940	13.6	3.34
SHM-05-42A	SHM-05-42A-FAL20	11/9/2020	3	U	0.68	176	5.63	67	12.2	15.6
SHM-05-42B	SHM-05-42B-FAL20	11/9/2020	**160**		0.72	-24.5	6.22	296	12.1	6.3
SHM-07-03	SHM-07-03-FAL20	11/11/2020	3	U	7.85	139	5.84	1,270	14.2	12.9
SHM-07-05X	SHM-07-05X-FAL20	11/11/2020	**83**		0.81	56.2	6.75	253	18.2	27.4
SHM-10-02	SHM-10-02-FAL20	11/10/2020	3	U	0.28	101	6.4	608	14.8	4.02
SHM-10-03	SHM-10-03-FAL20	11/10/2020	1.9	J	0.52	93.5	6.8	598	16.5	9.84

Table 3
Analytical Results/Data Included on Figure 3
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Devens, Massachusetts

		Analytical Method	Dissolved Metals		Field Parameters					
		Analyte	Arsenic		DO	ORP	pH	SPC	Temp	Turbidity
		Unit	µg/L		mg/L	mv	SU	µS/cm	°C	NTU
		Screening Limit *	10							
Location	Sample ID	Date								
SHM-10-04	SHM-10-04-FAL20	11/12/2020	3	U	0.73	96	6.03	459	11.6	6.01
SHM-10-05A	SHM-10-05A-FAL20	11/12/2020	2	J	1.21	158	5.64	165	13.5	6.2
SHM-10-06	SHM-10-06-FAL20	10/30/2020	**1,000**		0.77	-10.6	6.5	479	8.3	28.3
SHM-10-06A	SHM-10-06A-FAL20	11/13/2020	**71**		0.82	50	5.59	150	9.3	6.3
SHM-10-07	SHM-10-07-FAL20	11/10/2020	**1,000**		0.41	-45.4	7.74	644	12.7	5.27
SHM-10-08	SHM-10-08-FAL20	11/10/2020	3	U	0.36	113	6.46	656	14.7	4.65
SHM-10-10	SHM-10-10-FAL20	11/9/2020	3	U	0.32	216	6.33	5,090	16.9	2.55
SHM-10-11	SHM-10-11-FAL20	11/12/2020	**430**		0.19	15.9	5.97	541	12	19
SHM-10-12	SHM-10-12-FAL20	11/11/2020	**3,400**		0.5	53.6	5.78	394	12.3	13.1
SHM-10-13	SHM-10-13-FAL20	10/30/2020	**430**		0.68	-64.6	6.35	332	8.2	12.4
SHM-10-14	SHM-10-14-FAL20	11/10/2020	**5,000**		0.93	-67.4	6.28	244	6.3	10.7
SHM-10-15	SHM-10-15-FAL20	11/2/2020	**6,800**		0.85	-43.6	6.34	228	8.8	19.5
SHM-10-16	SHM-10-16-FAL20	11/12/2020	**1,100**		0.87	-65.4	6.22	387	11.5	25.9
SHM-11-02	SHM-11-02-FAL20	11/3/2020	**12**		0.49	-29.7	6.76	533	9.3	14.9
SHM-11-06	SHM-11-06-FAL20	11/2/2020	**620**		0.46	41.3	7.16	533	9.2	10.4
SHM-11-06 (FD)	SHL-DUP03-FAL20	11/2/2020	**680**		--	--	--	--	--	--
SHM-13-01	SHM-13-01-FAL20	11/9/2020	3	U	4.26	230	5.69	4690	11.8	2.95
SHM-13-02	SHM-13-02-FAL20	11/5/2020	3	U	2.04	165	6.13	245	13.5	9.4
SHM-13-03	SHM-13-03-FAL20	10/29/2020	**83**		1.15	14.4	4.93	315	10.8	5.6
SHM-13-04	SHM-13-04-FAL20	11/6/2020	**260**	**J**	2.89	239	6.17	290	14.7	128
SHM-13-05	SHM-13-05-FAL20	11/6/2020	6.4		1.15	217	6.13	134	12.4	3.7
SHM-13-06	SHM-13-06-FAL20	11/9/2020	**2,200**		0.06	-131	6.86	5,000	16.1	14.2
SHM-13-07	SHM-13-07-FAL20	11/5/2020	**420**		0.85	-26.3	6.35	498	14.6	77.3
SHM-13-08	SHM-13-08-FAL20	11/10/2020	**1,000**		0.27	-120	6.55	612	18	15.9
SHM-13-14D	SHM-13-14D-FAL20	10/29/2020	3	U	3.62	94.3	5.57	409	10.9	14.3
SHM-13-14S	SHM-13-14S-FAL20	10/29/2020	1.5	J	0.67	158	5.83	305	11.4	5.9
SHM-13-15	SHM-13-15-FAL20	10/29/2020	7.1		0.67	14.5	6.56	394	11.2	12.7
SHM-93-10D	SHM-93-10D-FAL20	11/11/2020	3	U	1.08	-122	11.2	275	19.4	15.7
SHM-93-18B	SHM-93-18B-FAL20	11/12/2020	3	U	0.69	216	5.86	392	12.6	8.5
SHM-93-22B	SHM-93-22B-FAL20	11/3/2020	**300**		0.9	-24.2	6.45	322	9.1	42
SHM-93-22C	SHM-93-22C-FAL20	11/3/2020	4.4		2.46	-13.9	7.52	192	9.2	4.2
SHM-93-24A	SHM-93-24A-FAL20	10/26/2020	3	U	8.09	257	5.86	460	12	2.99
SHM-96-5B	SHM-96-5B-FAL20	11/10/2020	**720**		1.07	2.6	6.17	324	12	124
SHM-96-5B (FD)	SHL-DUP08-FAL20	11/10/2020	**640**		--	--	--	--	--	--
SHM-96-5C	SHM-96-5C-FAL20	11/10/2020	**29**		0.69	8.4	6.27	335	13.1	12.6
SHM-99-31A	SHM-99-31A-FAL20	11/2/2020	**20**		0.99	266	5.58	86	8.2	14.6
SHM-99-31B	SHM-99-31B-FAL20	10/30/2020	1.9	J	6.46	97.6	6.78	77	6.7	5.3
SHM-99-31C	SHM-99-31C-FAL20	10/30/2020	**140**		1.1	-37.1	6.61	31	6.7	4.6
SHM-99-32X	SHM-99-32X-FAL20	10/30/2020	**26**		1.06	-36.1	6.63	241	8.8	11.4
SHP-01-36X	SHP-01-36X-FAL20	11/11/2020	6.6		0.97	46.3	6.42	232	13.6	2.7
SHP-01-37X	SHP-01-37X-FAL20	11/11/2020	6.1		3.38	44.9	6.66	247	15.4	3.2
SHP-01-38A	SHP-01-38A-FAL20	11/11/2020	**150**		0.88	29.6	5.82	191	15	7.1
SHP-01-38A (FD)	SHL-DUP04-FAL20	11/11/2020	**140**		--	--	--	--	--	--
SHP-2016-06A	SHP-2016-06A-FAL20	11/12/2020	**640**		0.44	2.8	8.27	399	11.9	3.15
SHP-2016-06B	SHP-2016-06B-FAL20	11/12/2020	**1,100**		0.45	-7.5	8.7	501	10.2	7.22
SHP-2016-06C	SHP-2016-06C-FAL20	11/12/2020	**350**		0.36	-7.8	8.98	256	9.6	7.13
SHP-2016-07B	SHP-2016-07B-FAL20	11/13/2020	**65**		1.38	-13.5	7.05	174	8.4	42.1
SHP-2016-07B (FD)	SHL-DUP06-FAL20	11/13/2020	**71**		--	--	--	--	--	--
SHP-2016-1A	SHP-2016-1A-FAL20	11/5/2020	3	U	3.52	101	7.64	45	12.9	8.48
SHP-2016-1B	SHP-2016-1B-FAL20	11/5/2020	**140**		0.3	45.5	7.46	207	12.5	6.62
SHP-2016-2A	SHP-2016-2A-FAL20	11/6/2020	8.5		2.87	7.2	8.74	81	11.6	5
SHP-2016-2B	SHP-2016-2B-FAL20	11/6/2020	**520**		0.78	-78.2	6.51	269	10.4	4.6
SHP-2016-3A	SHP-2016-3A-FAL20	11/2/2020	5.3		1.17	151	6.53	97	6.6	3.4
SHP-2016-3B	SHP-2016-3B-FAL20	11/3/2020	**180**		1.01	-43.9	6.3	151	7.3	11.8
SHP-2016-4A	SHP-2016-4A-FAL20	11/6/2020	3	U	4.27	148	6.19	40	10.3	7.2
SHP-2016-4B	SHP-2016-4B-FAL20	11/6/2020	**1,700**		0.87	-69.6	6.43	305	10.1	6.5
SHP-2016-5A	SHP-2016-5A-FAL20	11/9/2020	3.9		0.72	-5.1	6.4	157	11.2	2.79
SHP-2016-5B	SHP-2016-5B-FAL20	11/9/2020	**730**		0.76	-87.7	6.56	339	12.8	2.1
SHP-99-29X	SHP-99-29X-FAL20	11/2/2020	**2,300**		1.5	0.2	5.92	118	7.9	67.9

Table 3
Analytical Results/Data Included on Figure 3
2021 Technical Memo
Shepley's Hill Landfill, Former Fort Devens Army Installation
Devens, Massachusetts

Notes:

*Screening Limits:	Shepley's Hill Landfill Cleanup Level
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	degree 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	USACE	United States Army Corps of Engineers

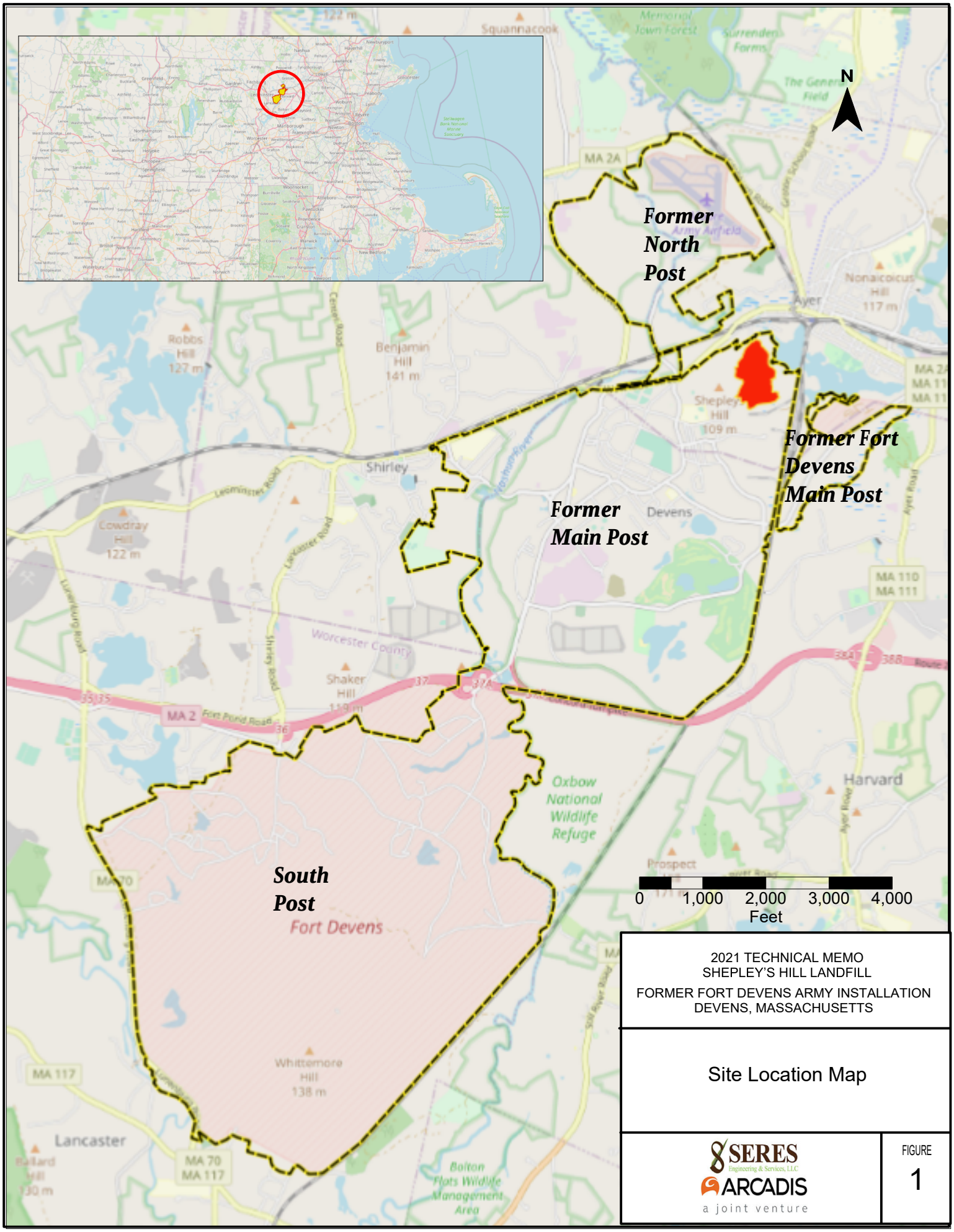
Analytical Parameters:

#	= Above Cleanup Level

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



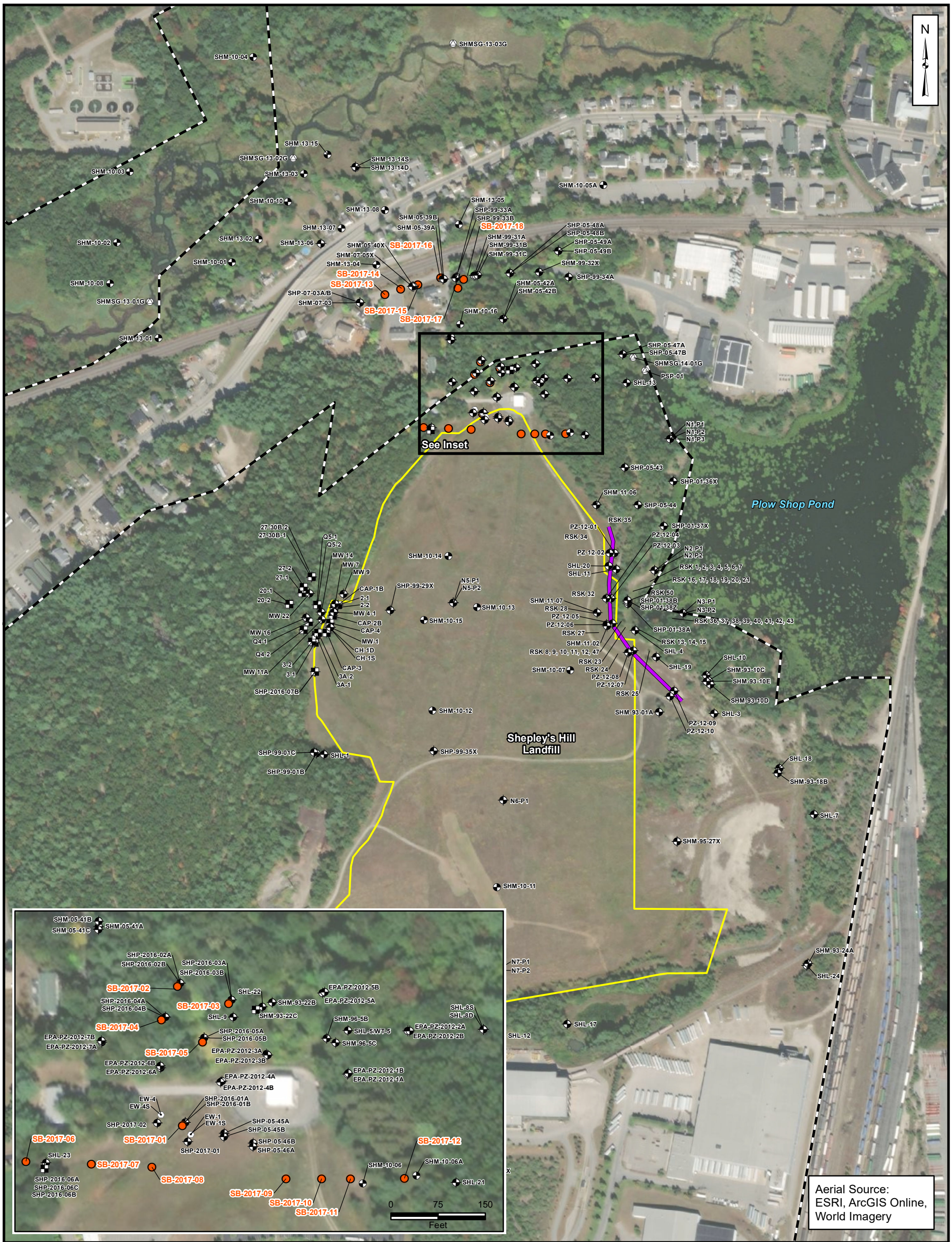
2021 TECHNICAL MEMO
SHEPLEY'S HILL LANDFILL

FORMER FORT DEVENS ARMY INSTALLATION
DEVENS, MASSACHUSETTS

Site Location Map

SERES Engineering & Services, LLC
ARCADIS
a joint venture

FIGURE
1



Legend

- Former Fort Devens Boundary
- Shepley's Hill Landfill Boundary
- Barrier Wall
- Overburden Monitoring Well/Piezometer
- Groundwater Profiling Location/Monitoring Well
- Bedrock Monitoring Well
- Extraction Well
- Stream Gauge
- Geoprobe Vertical Profile Location

0 200 400
Feet

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

Geoprobe Vertical Profile Locations

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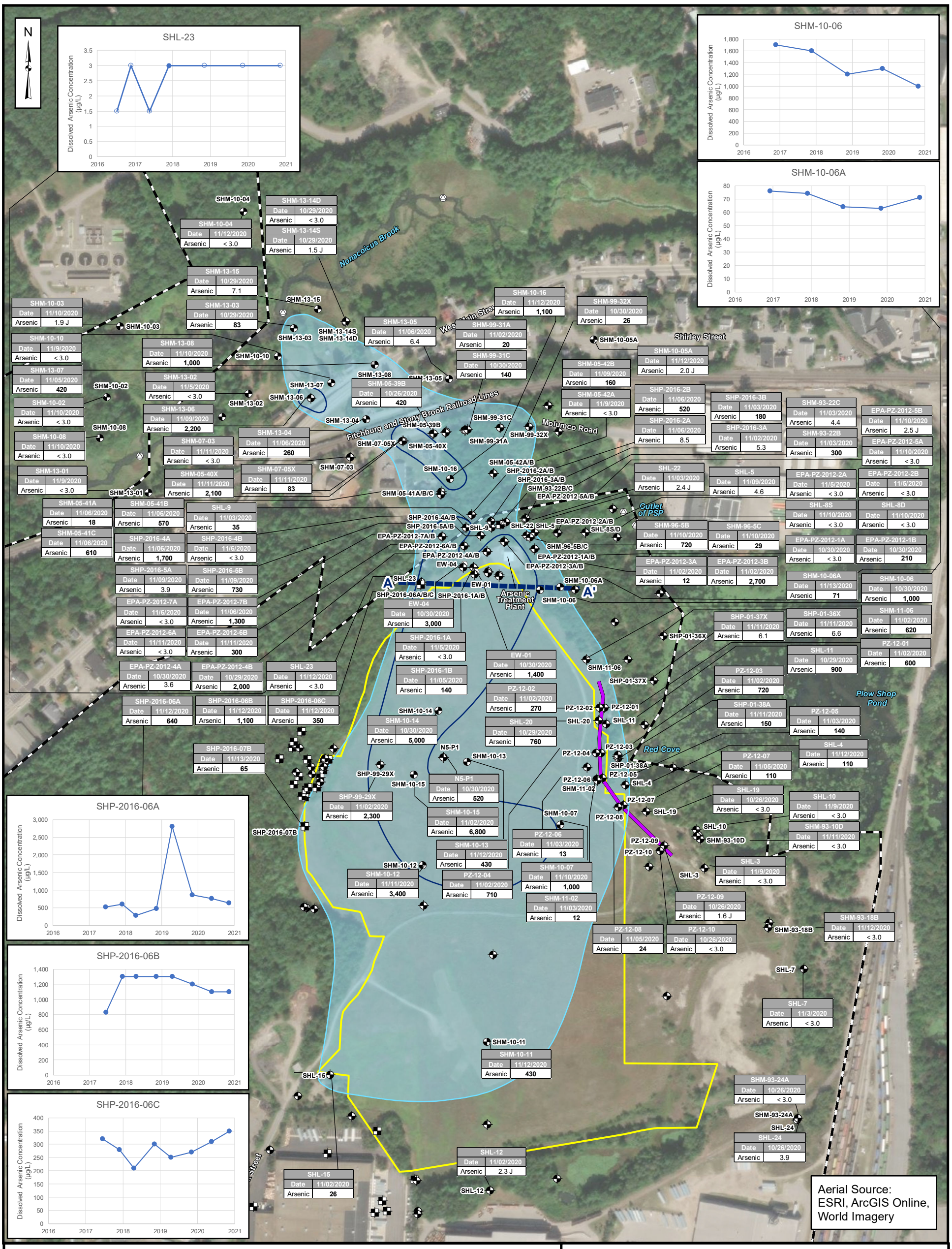
Figure
2

File: Figure 2 - Vertical Profile Locations.mxd



Aerial Source: ESRI, ArcGIS Online, World Imagery

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
- Cross-Section Location

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

0 200 400
Feet

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

Extent of Dissolved Arsenic in Groundwater October/November 2020

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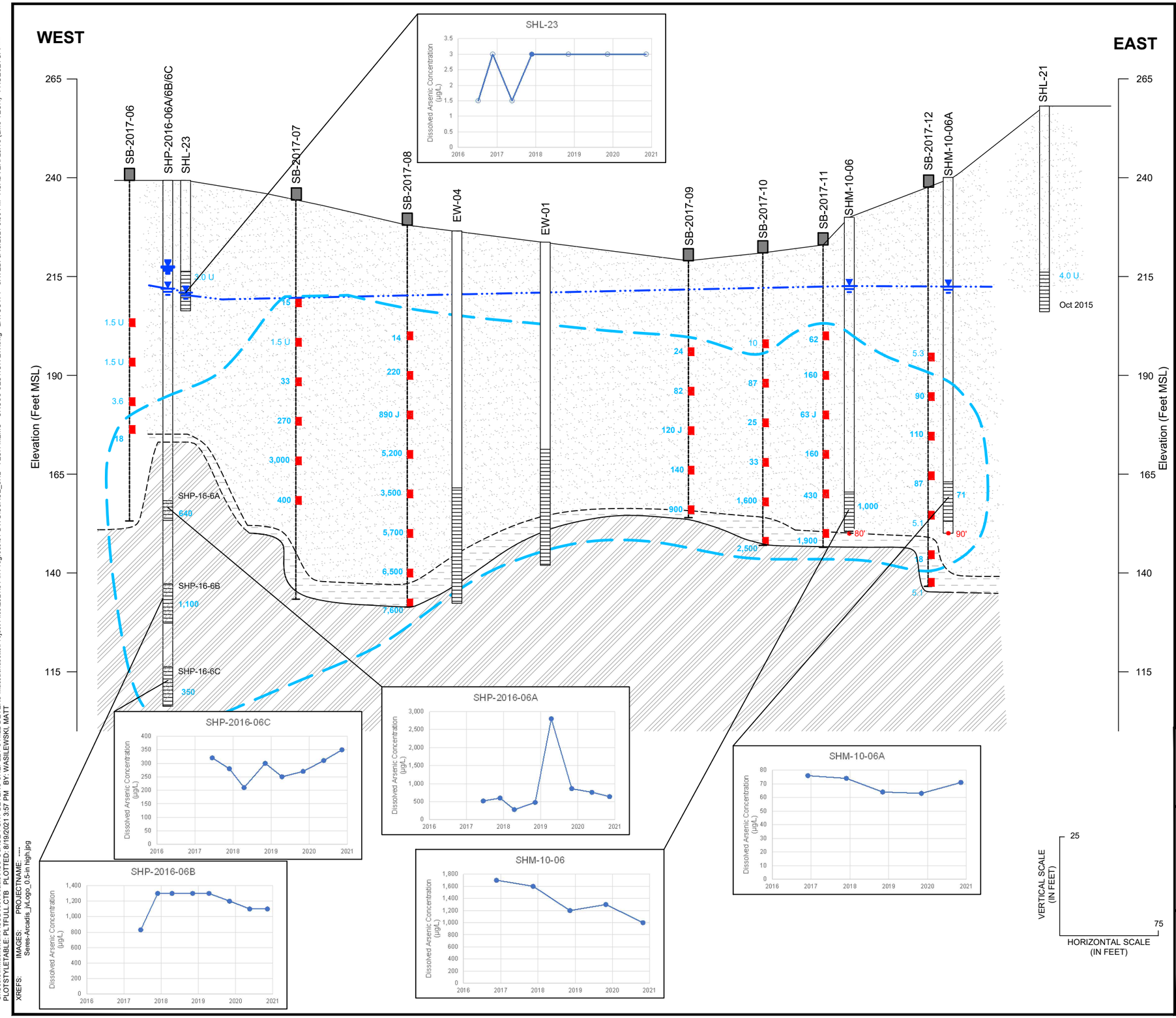
Figure
3

File: Figure 3 - SHL Arsenic - Fall 2020.mxd



Legend

SHL-21 — Monitoring Well

4.0 U — Arsenic Concentration (µg/L) (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)

Sample Interval (1 Foot)

Boring to Refusal

Interpreted Area of Arsenic > CL of 10 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.
8. Extraction wells are projected onto the cross-section and are not installed in bedrock.

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

DISSOLVED ARSENIC IN GROUNDWATER - WEST TO EAST CROSS SECTION

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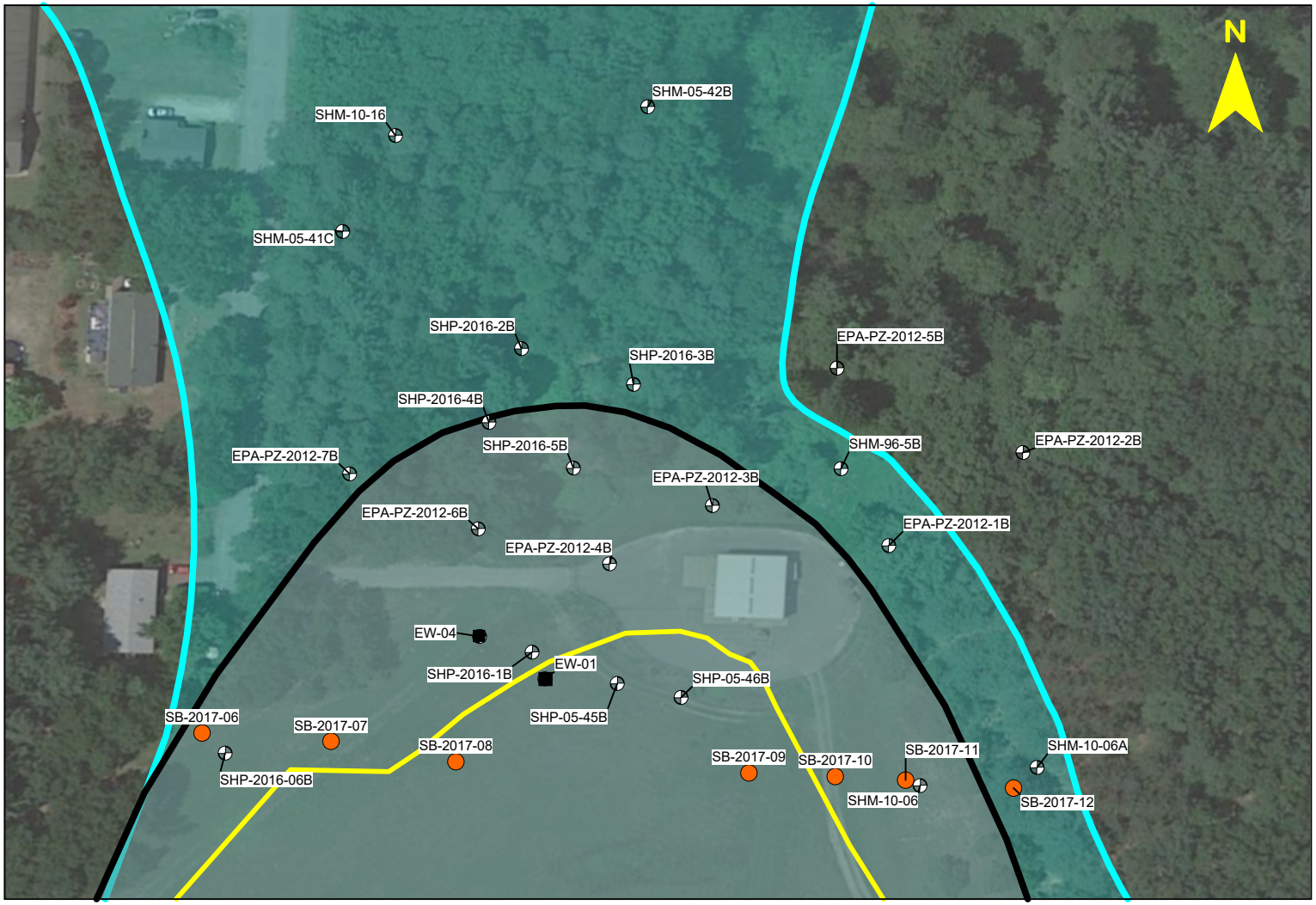
Figure 4

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\ACCDocs\Arcadis\AUS-USACE-FORT DEVENS-SHEPLEY'S HILL-DEVENS Massachusetts\Project Files\2021\01-In Progress\01-DWG\USACE_SHL - TECH MEMO - CROSS SECTION EW.dwg LAYOUT: 4 SAVED: 8/19/2021 3:56 PM ACADVER: 23.1S (LMS TECH) PAGESETUP: ----
PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 8/19/2021 3:57 PM BY: WASILEWSKI, MATT
XREFS: IMAGES: PROJECTNAME: ----
Seres-Arcadis_jvLogo_0.5-in high.jpg



Legend

- Extraction Wells
- Monitoring Wells
- Geoprobe Vertical Profile Location
- Interpreted Area of Arsenic > 10 µg/L
- Estimated Average Spring 2016-2020 Groundwater Capture Zone
- SHL Landfill Boundary

0 120 240
Feet

Notes

1. µg/L = microgram per liter

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

Estimated Average Spring 2016-2020 Lateral Groundwater Capture Zone with Extent of Dissolved Arsenic in Groundwater October/November 2020

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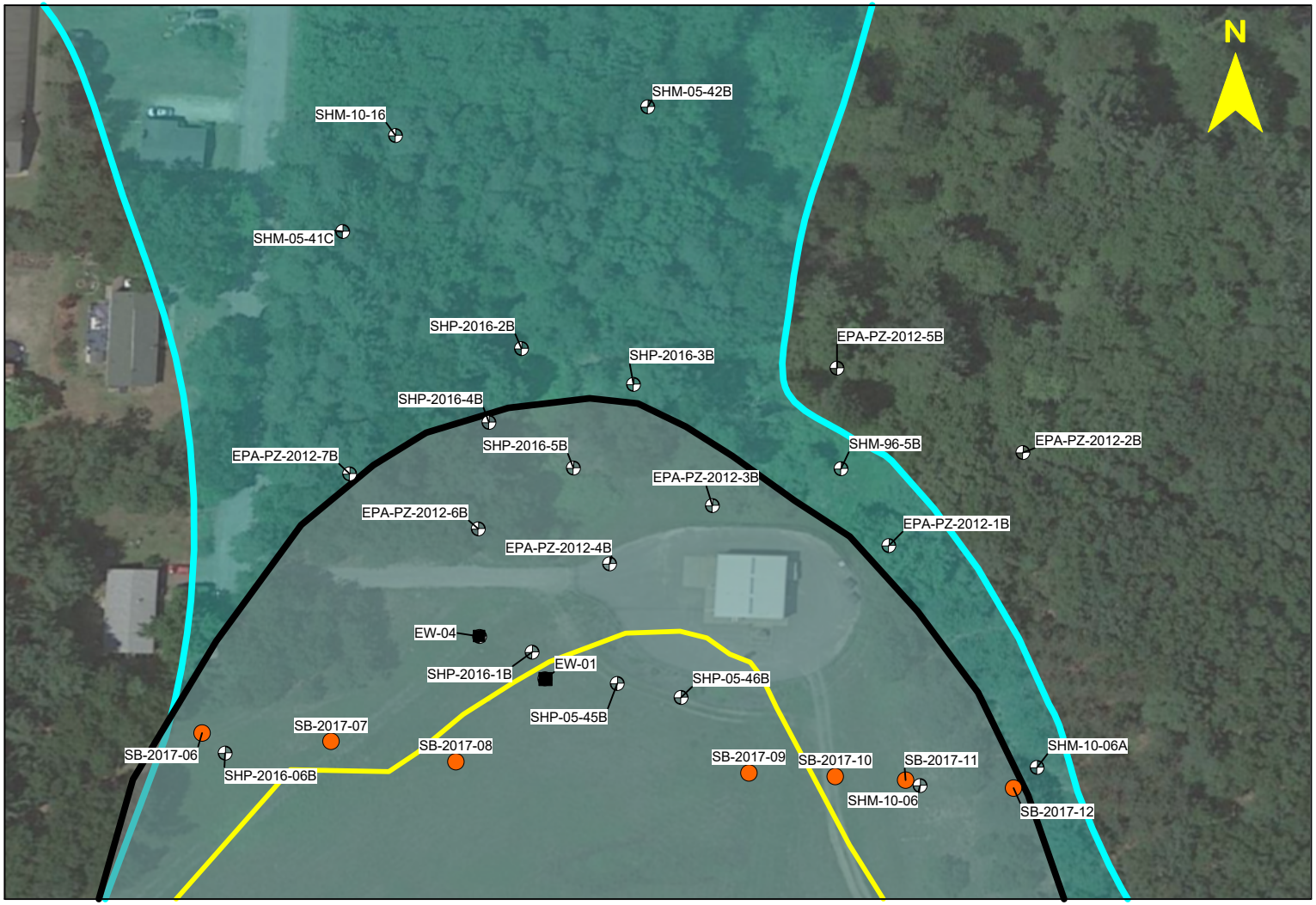
FIGURE
5



Legend

- Extraction Wells
- Monitoring Wells
- Geoprobe Vertical Profile Location
- Interpreted Area of Arsenic > 10 µg/L
- Estimated Average Fall 2016-2020 Groundwater Capture Zone
- SHL Landfill Boundary

0 120 240
Feet

Notes

1. µg/L = microgram per liter

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

Estimated Average Fall 2016-2020 Lateral Groundwater Capture Zone with Extent of Dissolved Arsenic in Groundwater October/November 2020

SERES Engineering & Services, LLC
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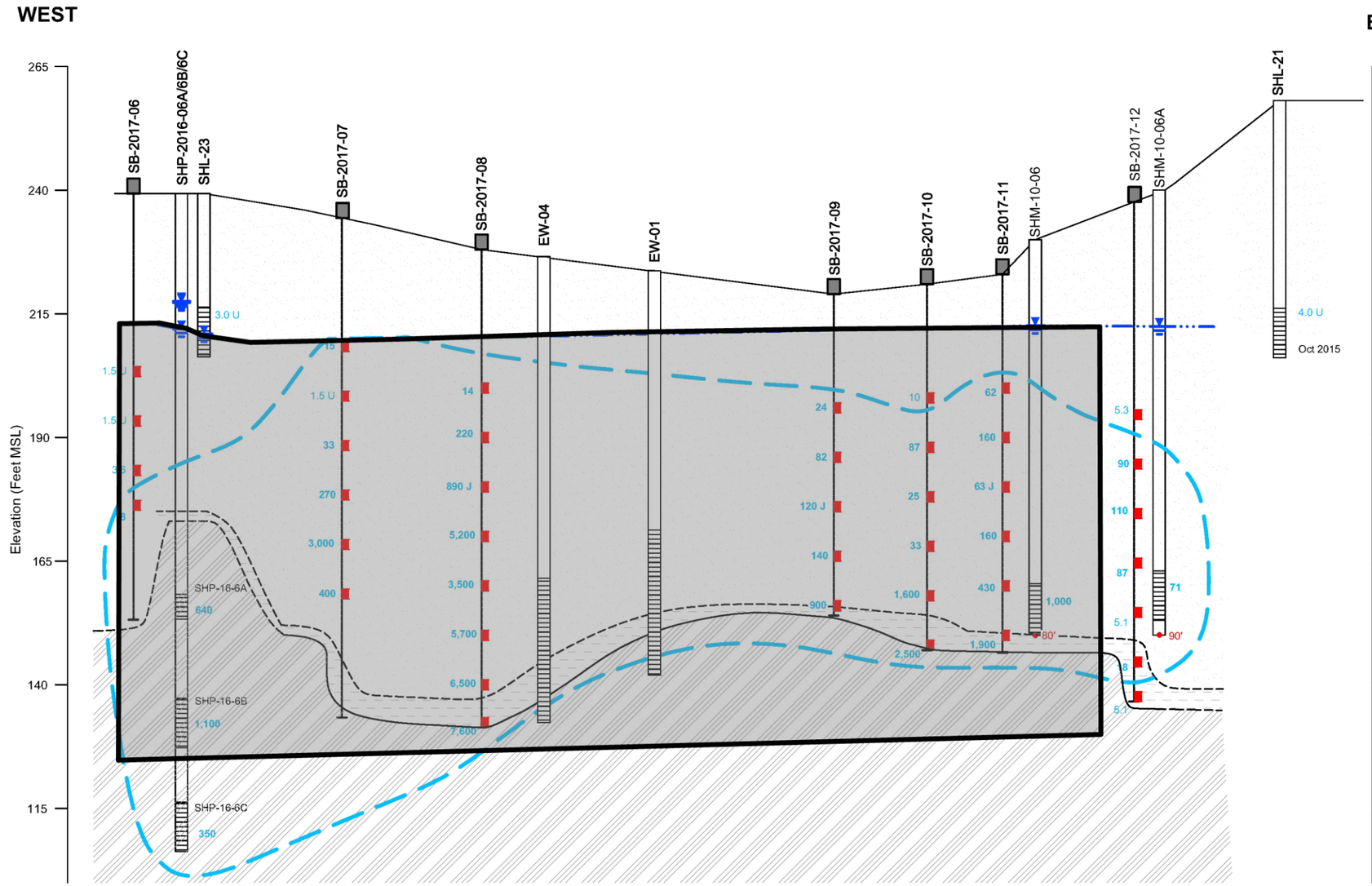
FIGURE
6



Legend

Monitoring Well

4.0 U Arsenic Concentration (µg/L) (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

2017 Soil Boring

25 Arsenic Concentration (µg/L)

Sample Interval (1 Foot)

Boring to Refusal

Interpreted Area of Arsenic > CL of 10 µg/L

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

Sand

Bedrock

Till

Estimated Average Spring 2016-2020 Groundwater Capture Zone

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.
8. Extraction wells are projected onto the cross-section and are not installed in bedrock.

VERTICAL SCALE (IN FEET) 25

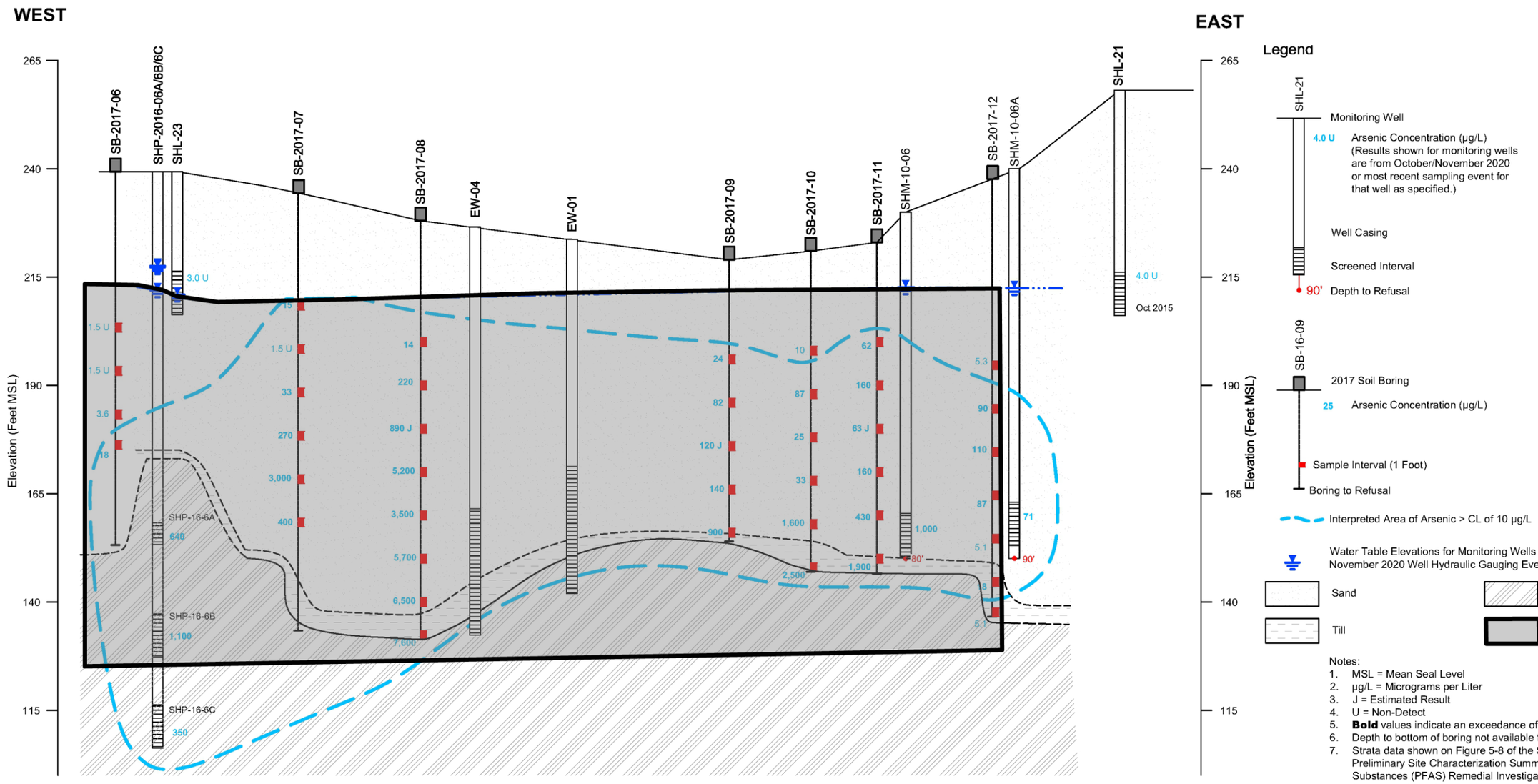
HORIZONTAL SCALE (IN FEET) 75

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

Estimated Average Spring 2016-2020 Vertical Groundwater Capture Zone with Extent of Dissolved Arsenic in Groundwater October/November 2020

SERES ARCADIS a joint venture

FIGURE 7



Legend

SHL-21

Monitoring Well

4.0 U Arsenic Concentration (µg/L) (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)

Sample Interval (1 Foot)

Boring to Refusal

Interpreted Area of Arsenic > CL of 10 µg/L

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

Sand

Bedrock

Till

Estimated Average Fall 2016-2020 Groundwater Capture Zone

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.
8. Extraction wells are projected onto the cross-section and are not installed in bedrock.

VERTICAL SCALE (IN FEET) 25

HORIZONTAL SCALE (IN FEET) 75

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

Estimated Average Fall 2016-2020 Vertical Groundwater Capture Zone with Extent of Dissolved Arsenic in Groundwater October/November 2020

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FIGURE 8

Attachment 1

Field Forms (low-flow forms)

KGS

Field Instrument Calibration Log

Date: 8/28/17 **Weather:** Sun, 65°

Project/Site Name: Devens / SHL **Instrument:** YSI 556

Calibrated By: L. Klosterman **Serial Number:** 14K101575

Parameters	Solution Expiration Date	Morning Calibration Time 0830		Cal. Temperature °C	Afternoon Calibration Time 1730		Cal. Temperature °C
Specific Conductivity (1.413 µS/cm°)	3/18		1.413	14.91		1.413	15.32
pH (7)	6/17		6.99	14.08 ~~6.99~~		6.83	15.13
pH (4)	2/19		4.00	13.84		4.01	15.36
pH (10)	10/18		10.06	14.40		10.05	15.12
ORP (240 mv)	1/22		240	14.99		240	14.93
Dissolved Oxygen (%)	–		99.9	15.42		99.8%	15.15
Dissolved Oxygen (mg/L)	–		—	—		—	—
Barometric Pressure (mmHg)	—		760	–		762	–

Notes:

Signature: Lynne Klosterman **Date:** 8/28/17

KGS

Field Instrument Calibration Log

Date: 8-29-17

Weather: 51° Barometer 30.31 in

Project/Site Name: Devens/SHL

Instrument: YSI 556

Calibrated By: Kerk Halberg

Serial Number: 14K101 575

Parameters	Solution Expiration Date	Morning Calibration Time 640		Cal. Temperature °C	Afternoon Calibration Time 545		Cal. Temperature °C
Specific Conductivity (1.413 µS/cm°)	3/18		1.413	16.02		1.413	15.38
pH (7)	2/19		7.01	17.87		6.98	15.42
pH (4)	2/19		4.00	17.52		4.01	15.51
pH (10)	10/18		10.07	17.77		10.06	15.39
ORP (240 mv)	3/22		240.4	18.26		240	15.72
Dissolved Oxygen (%)	—		99.5	17.13		99.7	15.45
Dissolved Oxygen (mg/L)	—		—	—		—	—
Barometric Pressure (mmHg)	—		760	—		760	—

Notes: Hach 2100Q Turbidity Meter 10 NTU → Read 9.5 (Passed 100 → 101
20 20.5 800 → 795 Completed Calibration

Signature: Kerk Halberg

Date: 8-29-17

KGS

Field Instrument Calibration Log

Date: 8/15/17 **Weather:** 80's / cloudy

Project/Site Name: SHL **Instrument:** YSI 556 MPS

Calibrated By: VVA **Serial Number:** 15C103559

Parameters	Solution Expiration Date	Morning Calibration Time 715		Cal. Temperature °C	Afternoon Calibration Time 1400		Cal. Temperature °C
Specific Conductivity (1.413 µS/cm°)	3/18	1.410	1.413	17.23	1.399	1.413	18.17
pH (7)	2/19	7.01	7.00		6.97	7.00	
pH (4)	10/18	4.00	4.00		3.99	4.00	
pH (10)	10/18	10.13	10.00		10.02	10.00	
ORP (240 mv)	1/22	240.3	240.1		239.7	240.0	
Dissolved Oxygen (%)	—	97.6%	100.1%		97.1%	100.0%	
Dissolved Oxygen (mg/L)		—	—			—	
Barometric Pressure (mmHg)		—	—			—	

Notes:

Signature: [signature] **Date:** 8/15/17

KGS

Field Instrument Calibration Log

Date: 8/16/17 **Weather:** 80's/Sunny

Project/Site Name: SML **Instrument:** YSI 556 MPS

Calibrated By: VGA **Serial Number:** 15C103539

Parameters	Solution Expiration Date	Morning Calibration Time 710		Cal. Temperature °C	Afternoon Calibration Time 1500		Cal. Temperature °C
Specific Conductivity (1.413 µS/cm°)	3/18	1.410	1.413	17.69	1.416	1.413	17.89
pH (7)	2/19	7.01	7.09		7.03	7.09	
pH (4)	10/18	3.99	4.00		4.06	4.09	
pH (10)	10/18	10.02	10.00		10.01	10.00	
ORP (240 mv)	1/22	237.6	240.1		239.7	240.0	
Dissolved Oxygen (%)	—	98.8%	100.0%		98.6%	100.1%	
Dissolved Oxygen (mg/L)							
Barometric Pressure (mmHg)							

Notes:

Signature: [illegible] **Date:** 8/16/17

KGS

Field Instrument Calibration Log

Date: 8/17/17 **Weather:** 80's

Project/Site Name: SHL **Instrument:** YSI 556 MPS

Calibrated By: KA **Serial Number:** 15C103559

Parameters	Solution Expiration Date	Morning Calibration Time 709		Cal. Temperature °C	Afternoon Calibration Time 1800		Cal. Temperature °C
Specific Conductivity (1.413 µS/cm°)	3/18	1.410	1.413	16.59	1.399	1.413	18.49
pH (7)	2/19	7.01	7.01		7.06	7.00	
pH (4)	10/18	3.99	4.00		4.07	4.00	
pH (10)	10/18	9.92	10.00		9.99	10.00	
ORP (240 mv)	1/22	237.6	240.0		238.7	240.0	
Dissolved Oxygen (%)	—	96.4%	100.0%		103.6%	100.2%	
Dissolved Oxygen (mg/L)	—						
Barometric Pressure (mmHg)	—						

Notes:

Signature: [signature] **Date:** 8/17/17

KGS

Field Instrument Calibration Log

Date: 8/18/17 **Weather:** 80's Rain

Project/Site Name: SHL **Instrument:** YSI 556 MPS

Calibrated By: VGA **Serial Number:** 15C103559

Parameters	Solution Expiration Date	Morning Calibration Time 655		Cal. Temperature °C	Afternoon Calibration Time _____		Cal. Temperature °C
Specific Conductivity (1.413 µS/cm°)	3/18	1.410	1.412	17.39			unit not used
pH (7)	2/19	7.13	7.00				
pH (4)	10/18	4.07	4.00				
pH (10)	10/18	10.13	10.00				
ORP (240 mv)	1/22	237.6	240.0				
Dissolved Oxygen (%)	—	94.3%	100.0%				
Dissolved Oxygen (mg/L)	—		—				
Barometric Pressure (mmHg)	—		—				

Notes:

Signature: [illegible] **Date:** 8/18/17

KGS

Field Instrument Calibration Log

Date: 8/21/17 **Weather:** 80's Sunny

Project/Site Name: SHL **Instrument:** YSI 556 MPS

Calibrated By: MGA **Serial Number:** 15C103559

Parameters	Solution Expiration Date	Morning Calibration Time 700		Cal. Temperature °C	Afternoon Calibration Time 1700		Cal. Temperature °C
Specific Conductivity (1.413 µS/cm°)	3/8	1.337	1.413	15.97	1.400	1.413	18.97
pH (7)	2/19	6.94	7.00		6.94	7.00	
pH (4)	10/18	3.87	4.00		3.97	4.00	
pH (10)	10/18	9.86	10.00		9.90	10.00	
ORP (240 mv)	1/22	236.4	240.0		238.7	240.0	
Dissolved Oxygen (%)	—	93.7%	100.0%		106.9%	100.0%	
Dissolved Oxygen (mg/L)	—		—				
Barometric Pressure (mmHg)	—		—				

Notes:

Signature: [signature] **Date:** 8/21/17

KGS

Field Instrument Calibration Log

Date: 8/22/17 **Weather:** 80's

Project/Site Name: SHL **Instrument:** YSI 556 MPS

Calibrated By: WA **Serial Number:** 15C103559

Parameters	Solution Expiration Date	Morning Calibration Time 650		Cal. Temperature °C	Afternoon Calibration Time 1700		Cal. Temperature °C
Specific Conductivity (1.413 µS/cm°)	3/8	1.409	1.413	18.73	1.417	1.413	19.47
pH (7)	2/19	6.90	7.00		7.01	7.00	
pH (4)	10/18	3.87	4.00		4.06	4.00	
pH (10)	10/18	9.78	10.00		10.13	10.00	
ORP (240 mv)	1/22	237.6	240.0		237.1	240.0	
Dissolved Oxygen (%)	—	98.6%	100.0%		103.2%	100.1%	
Dissolved Oxygen (mg/L)	—				—		
Barometric Pressure (mmHg)	—				—		

Notes:

Signature: [signature] **Date:** 8/22/17

KGS

Field Instrument Calibration Log

Date: 8/23/17 **Weather:** 80s

Project/Site Name: SHL **Instrument:** YSI 556 MPS

Calibrated By: KGA **Serial Number:** 15C103559

Parameters	Solution Expiration Date	Morning Calibration Time 655		Cal. Temperature °C	Afternoon Calibration Time 1600		Cal. Temperature °C
Specific Conductivity (1.413 µS/cm°)	3/8	1.410	1.413	18.75	1.416	1.413	19.01
pH (7)	2/19	7.13	7.00		7.12	7.00	
pH (4)	10/18	3.97	4.00		4.03	4.00	
pH (10)	10/18	10.16	10.00		10.09	10.00	
ORP (240 mv)	1/22	237.6	240.0		239.7	240.0	
Dissolved Oxygen (%)	–	98.6%	100.0%		98.7%	100.0%	
Dissolved Oxygen (mg/L)	–				–		
Barometric Pressure (mmHg)	–						

Notes:

Signature: [signature] **Date:** 8/23/17

KGS

Field Instrument Calibration Log

Date: 8/24/17 **Weather:** 70's

Project/Site Name: SML **Instrument:** YSI 556 MPS

Calibrated By: LGA **Serial Number:** 15C103559

Parameters	Solution Expiration Date	Morning Calibration Time 650		Cal. Temperature °C	Afternoon Calibration Time 1635		Cal. Temperature °C
Specific Conductivity (1.413 µS/cm°)	3/8	1.378	1.413	16.09	1.410	1.413	17.21
pH (7)	2/19	6.89	7.00		7.01	7.00	
pH (4)	10/18	4.01	4.00		4.03	4.00	
pH (10)	10/18	9.87	10.00		9.87	10.00	
ORP (240 mv)	1/22	238.6	240.0		239.7	240.0	
Dissolved Oxygen (%)	–	94.7%	100.1%		103.2%	101.0%	
Dissolved Oxygen (mg/L)	–	–			–		
Barometric Pressure (mmHg)	–	–			–		

Notes:

Signature: [signature] **Date:** 8/24/17

KGS

Field Instrument Calibration Log

Date: 8/25/17 **Weather:** 70's cloudy

Project/Site Name: Devers SHL **Instrument:** YSI 556 MPS

Calibrated By: WA **Serial Number:** 15C103559

Parameters	Solution Expiration Date	Morning Calibration Time 650		Cal. Temperature °C	Afternoon Calibration Time 1650		Cal. Temperature °C
Specific Conductivity (1.413 µS/cm°)	3/8	1.419	1.413	15.87	1.429	1.413	17.23
pH (7)	2/19	6.93	7.00		6.94	7.00	
pH (4)	10/18	3.97	4.00		3.92	4.00	
pH (10)	10/18	9.86	10.00		10.07	10.00	
ORP (240 mv)	1/22	237.6	240.0		237.6	240.0	
Dissolved Oxygen (%)	–	94.8%	100.0%		98.6%	100.0%	
Dissolved Oxygen (mg/L)	–	–					
Barometric Pressure (mmHg)	–	–					

Notes:

Signature: [signature] **Date:** 8/25/17

KGS

Field Instrument Calibration Log

Date: 8/28/17 **Weather:** 79's

Project/Site Name: SML **Instrument:** YSI 556 MPS

Calibrated By: WA **Serial Number:** 15C103559

Parameters	Solution Expiration Date	Morning Calibration Time 655		Cal. Temperature °C	Afternoon Calibration Time ~~19~~ 1630		Cal. Temperature °C
Specific Conductivity (1.413 µS/cm°)	3/8	1.429	1.413	16.09	1.397	1.413	17.03
pH (7)	2/19	6.97	7.00		6.94	7.00	
pH (4)	10/18	3.89	4.00		4.01	4.00	
pH (10)	10/18	9.76	10.00		9.97	10.00	
ORP (240 mv)	1/22	243.1	240.0		238.6	240.0	
Dissolved Oxygen (%)	—	97.6%	100.0%		102.1%	100.0%	
Dissolved Oxygen (mg/L)	—		—				
Barometric Pressure (mmHg)	—		—				

Notes:

Signature: [signature] **Date:** 8/28/17

KGS

Field Instrument Calibration Log

Date: 8/29/17 **Weather:** 60's, cloudy

Project/Site Name: SHL **Instrument:** YSI 556 MPS

Calibrated By: VGL **Serial Number:** 15C103559

Parameters	Solution Expiration Date	Morning Calibration Time 700		Cal. Temperature °C	Afternoon Calibration Time ~~1540~~ 1700		Cal. Temperature °C
Specific Conductivity (1.413 µS/cm°)	3/8	1.397	1.413	15.97	1.371	1.413	16.31
pH (7)	2/19	7.13	7.00		6.86	7.00	
pH (4)	10/18	4.12	4.00		4.09	4.00	
pH (10)	10/18	10.09	10.00		9.89	10.00	
ORP (240 mv)	1/22	246.1	240.0		237.6	240.0	
Dissolved Oxygen (%)	–	97.8%	100.0%		98.4%	100.0%	
Dissolved Oxygen (mg/L)	–		–			–	
Barometric Pressure (mmHg)	–		–			–	

Notes:

Signature: [signature] **Date:** 8/29/17

KGS

Turbidity Instrument Calibration Log

Project/Site Name: SHL
Calibrated By: MA

Instrument: LaMotte 2020WE
Serial Number: 23456

Date	Pre-Cal 0 NTU AM	Post ~~Pre~~-Cal 0 NTU AM	Pre ~~Post~~-Cal 10 NTU AM	Post-Cal 10 NTU AM	Pre-Cal 0 NTU PM	Post ~~Pre~~-Cal 0 NTU PM	Pre ~~Post~~-Cal 10 NTU PM	Post-Cal 10 NTU PM
8/15/17	0.09	0.00	10.15	10.00	0.07	0.00	10.06	10.00
8/16/17	0.07	0.00	10.03	10.00	0.09	0.00	10.01	10.00
8/17/17	0.09	0.00	9.87	10.00	0.11	0.00	10.03	10.00
8/18/17	0.14	0.00	10.13	10.00	unit not used		☆	
8/21/17	0.17	0.00	9.86	10.00	0.13	0.00	10.12	10.00
8/22/17	0.13	0.00	10.15	10.00	0.16	0.00	9.79	10.00
8/23/17	0.17	0.00	10.17	10.00	0.09	0.00	9.86	10.00
8/24/17	0.09	0.00	10.24	10.00	0.07	0.00	9.97	10.00

Signature: [illegible]

Date: 8/24/17

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-06-35-37 **Geoprobe Sampler:** SP22

Project:	1081-005 Shepley's Hill Landfill	Date:	8/17/2017
Event:	Drilling Profile Samples	Sampler:	KGA
Location:	Fort Devens Massachusetts		

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*/Material	0.625"/PVC
Stickup (ft-bgs)	0.3
Depth to water (ft-bTOC)	25.48
Depth to bottom (ft bgs)	37
Screen Interval (ft-bgs)	35-37
Total volume purged (gal)	3.5
2 Well volumes purged (gal)	2.2

Sampling Type

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

Purge start/stop time: 1153/1218 Tubing diameter: 0.25 inch Air source: N/A

Field Instrument (Model/S/N): YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1153	140	NA	16.11	7.36	64	11.65	208.5	5.65	Clear
1158	140	NA	14.61	6.27	59	7.36	214.6	4.79	Clear
1203	140	NA	14.02	6.00	56	6.97	205.4	4.75	Clear
1208	140	NA	13.94	5.97	55	6.19	197.0	4.76	Clear
1213	140	NA	14.03	5.98	55	6.17	196.4	4.75	Clear
1218	140	NA	13.79	5.94	55	6.12	193.4	4.74	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

1.5-inch diameter tooling volume = 0.09 gal/ft or 350 ml per foot

Sampling Details

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

Filter Size (micron): 10+0.45 Dup ID/Time: NA

Comments: Used 2 filters. Collected Sample at 1220. Post DTW = 29.64 feet.

Tubing intake at mid screen. * Same size screen for SP22 or SP16. Used 1.5 inch for 2 well vol calculation.

Kevin G. Anderson 8/17/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-06-45-47 **Geoprobe Sampler:** SP22

Project:	1081-005 Shepley's Hill Landfill	Date:	8/17/2017
Event:	Drilling Profile Samples	Sampler:	KGA
Location:	Fort Devens Massachusetts		

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*/Material	0.625"/PVC
Stickup (ft-bgs)	0.3
Depth to water (ft-bTOC)	34.91
Depth to bottom (ft bgs)	47
Screen Interval (ft-bgs)	45-47
Total volume purged (gal)	3.0
2 Well volumes purged (gal)	2.2

Sampling Type

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

Purge start/stop time 1559/1623 Tubing diameter 1/2x5/8 inch Air source N/A

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1559	100	NA	19.69	5.69	94	6.30	163.2	4.69	Clear
1604	100	NA	19.84	5.66	92	3.94	162.9	flow stop	Clear
1609	100	NA	20.53	5.81	92	3.40	168.3	4.69	Clear
1613	100	NA	20.73	5.90	92	3.09	173.2	4.45	Clear
1618	100	NA	20.69	5.86	92	3.27	178.6	4.43	Clear
1623	100	NA	20.64	5.85	92	3.20	179.6	4.46	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

1.5-inch diameter tooling volume = 0.09 gal/ft or 350 ml per foot

Sampling Details

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

Filter Size (micron): 10,10,10,5,0.45 Dup ID/Time: NA

Comments: Used 14 filters in total. Collected Sample at 1630. Post DTW = 29.28 feet.Screen point 90% filled with silt. Tubing intake at mid screen. * Same size screen for SP22 or SP16. Used 1.5 inch for 2 well vol calculation.

Kevin G. Anderson 8/17/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-06A-55-57 **Geoprobe Sampler:** SP16

Project: 1081-005 Shepley's Hill Landfill Date: 8/31/2017

Event: Drilling Profile Samples Sampler: K. Anderson

Location: Fort Devens Massachusetts

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/Material	0.625"/PVC
Stickup (ft-bgs)	4.1
Depth to water (ft-bgs)	35.47
Depth to bottom (ft bgs)	57
Screen Interval (ft-bgs)	55-57
Total volume purged (gal)	6.0
2 Well volume purged (gal)	3.5

Sampling Type

Purging Method Waterra Hydrolift Tubing type LDHP Dedicated pump (Y/N) N

Purge start/stop time 1055/1125 Tubing diameter 3/8 x 1/2 inch Air source NA

Tubing intake 44 ft-bgs due to extreme sediment in water column Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1055	200	NA	19.72	9.5	84	9.98	227.5	7.14	Clear
1100	200	NA	19.59	8.4	81	8.29	258.1	5.22	Clear
1105	--	--	--	--	--	--	--	--	--
1110	200	NA	18.92	7.85	59	7.71	244.5	4.77	Clear
1115	200	NA	19.32	7.90	56	7.07	233.1	4.69	Clear
1120	200	NA	18.64	7.90	55	7.04	236.4	4.57	Clear
1125	200	NA	18.34	7.89	55	7.02	239.1	4.53	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+10+5+1+0.45 Dup ID/Time: NA

Comments: SB-2017-06A is offset 10-ft NW of SB-2017-06. A total of twelve filters were used during stablization and sampling. Collected sample at 1130. An EPA split sample was collected. 3 inches of sediment in bucket. Post DTW = 33.88 ft.

Kevin Anderson 8/31/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-06-62-64 **Geoprobe Sampler:** SP22

Project: 1081-004 Shepley's Hill Landfill Date: 8/21/2017
Event: Drilling Profile Samples Sampler: K. Anderson
Location: Fort Devens Massachusetts

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/Material	0.625"/PVC
Stickup (ft-bgs)	3.0
Depth to water (ft-bgs)	58.44
Depth to bottom (ft bgs)	64
Screen Interval (ft-bgs)	62-64
Total volume purged (gal)	3.0
2 Well Volumes purged (gal)	0.9*

Sampling Type

Purging Method Waterra Tubing type LDPE Dedicated pump (Y/N) N
Purge start/stop time 0926/1000 Tubing diameter 1/2x5/8 inch Air source NA
Field Instrument (Model/S/N) YSI 556MPS
Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
0926	200	NA	16.94	8.57	126	14.28	227.1	4.42	Clear
0931	200	NA	16.16	5.07	91	7.45	247.1	4.60	Clear
0936	200	NA	16.54	7.38	73	5.54	263.8	4.04	Clear
0941	200	NA	16.73	7.39	63	4.89	251.4	3.97	Clear
0946	200	NA	16.69	7.40	60	4.51	248.1	3.94	Clear
0951	200	NA	16.70	7.41	60	4.43	247.1	3.92	Clear
0956	200	NA	16.67	7.42	58	4.41	245.1	3.90	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size Used: 10+10+5+5+0.45 Dup ID/Time: NA

Comments: Nine filters were used. Collected sample at 1000. Post DTW Not collected. EPA split sample collected.
Tubing intake at top of screen. * Same size screen for SP22 or SP16. Used 1.5 inch for 1 well vol calculation.

Kevin Anderson * very silty conditions 8/21/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-07-25-27 **Geoprobe Sampler:** SP16

Project:	1081-005 Shepley's Hill Landfill	Date:	8/15/2017
Event:	Drilling Profile Samples	Sampler:	KGA
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	4.0
Depth to water (ft-bTOC)	16.1
Depth to bottom (ft bgs)	25
Screen Interval (ft-bgs)	25-27
Total volume purged (gal)	3.0
2 Well volumes purged (gal)	1.0

Sampling Type

Purging Method	Peristaltic	Tubing type	HDPE	Dedicated pump (Y/N)	N
Purge start/stop time	1035/1100	Tubing diameter	0.25 inch	Air source	N/A
				Field Instrument (Model/S/N)	YSI 556MPS
					Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1035	75	NA	17.71	6.58	102	1.42	103.9	17.40	Clear
1040	75	NA	17.71	6.32	91	1.52	113.6	14.30	Clear
1045	75	NA	17.11	6.18	88	0.95	125.4	12.80	Clear
1050	75	NA	17.72	6.13	86	0.70	128.4	11.20	Clear
1055	75	NA	17.64	6.17	84	0.69	131.3	7.96	Clear
1100	75	NA	17.76	6.18	84	0.68	134.2	7.86	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Comments: First SB of program. Used 1 filter so turbidity not below 5 NTU, corrected process after this interval.
Tubing intake at mid screen. Collected sample @1105. Post DTW = not recorded.

Kevin G. Anderson 8/15/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-07-35-37 **Geoprobe Sampler:** SP16

Project:	1081-005 Shepley's Hill Landfill	Date:	8/15/2017
Event:	Drilling Profile Samples	Sampler:	KGA
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	4.0
Depth to water (ft-bTOC)	16.7
Depth to bottom (ft bgs)	37
Screen Interval (ft-bgs)	35-37
Total volume purged (gal)	3.0
2 Well volumes purged (gal)	1.0

Sampling Type

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

Purge start/stop time 1240/1310 Tubing diameter 0.25 inch Air source N/A

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1240	100	NA	18.40	5.66	131	1.65	197.2	2.20	Clear
1245	100	NA	18.25	5.78	127	2.00	204.9	1.88	Clear
1250	100	NA	17.13	5.81	127	1.84	214.1	1.43	Clear
1255	100	NA	16.65	5.78	125	1.06	216.7	1.05	Clear
1300	100	NA	16.46	5.78	122	0.75	217.0	1.20	Clear
1305	100	NA	16.62	5.81	122	0.55	217.6	1.13	Clear
1310	100	NA	16.38	5.86	122	0.54	217.4	1.12	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size (micron): 10+0.45 Dup ID/Time: NA

Comments: Used 2 filters. Collected Sample at 1315. Post DTW not recorded.
Tubing intake at mid screen.

Kevin G. Anderson 8/15/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-07-45-47 **Geoprobe Sampler:** SP16

Project:	1081-005 Shepley's Hill Landfill	Date:	8/15/2017
Event:	Drilling Profile Samples	Sampler:	KGA
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	4.0
Depth to water (ft-bTOC)	18.97
Depth to bottom (ft bgs)	47
Screen Interval (ft-bgs)	45-47
Total volume purged (gal)	3.0
2 Well volumes purged (gal)	1.0

Sampling Type

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

Purge start/stop time 1440/1515 Tubing diameter 0.25 inch Air source N/A

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1440	150	NA	16.42	6.01	154	2.75	145.6	641.00	Clear
1445	150	NA	16.61	5.75	155	1.31	120.7	3.67	Clear
1450	150	NA	17.42	5.84	158	0.82	104.6	2.11	Clear
1455	150	NA	18.75	6.20	165	0.57	91.1	1.62	Clear
1500	150	NA	18.61	6.42	170	0.56	95.1	2.59	Clear
1505	150	NA	16.87	6.40	160	0.52	109.1	0.91	Clear
1510	150	NA	16.80	6.20	158	0.40	112.1	0.95	Clear
1515	150	NA	16.38	6.17	157	0.34	111.5	0.97	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size (micron): 10+0.45 Dup ID/Time: NA

Comments: Used 2 filters. Collected Sample at 1505. Post DTW = 18.68 feet.
Tubing intake at top of screen.

Kevin G. Anderson 8/15/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-07-55-57 **Geoprobe Sampler:** SP16

Project:	1081-005 Shepley's Hill Landfill	Date:	8/16/2017
Event:	Drilling Profile Samples	Sampler:	KGA
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	4.0
Depth to water (ft-bTOC)	24.2
Depth to bottom (ft bgs)	57
Screen Interval (ft-bgs)	55-57
Total volume purged (gal)	3.0
2 Well volumes purged (gal)	1.2

Sampling Type

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

Purge start/stop time: 0918/0958 Tubing diameter: 0.25 inch Air source: N/A

Field Instrument (Model/S/N): YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
0918	150	NA	19.97	7.12	230	3.23	-61.8	10.71	Clear
0923	150	NA	19.75	6.95	227	3.13	-55.5	7.19	Clear
0928	150	NA	19.71	6.85	227	2.98	-53.0	9.33	Clear
0933	150	NA	19.86	6.79	228	2.60	-51.0	9.01	Clear
0938	150	NA	19.93	6.80	230	2.31	-51.1	9.11	Clear
0943	150	NA	20.27	6.76	233	2.24	-51.3	2.48	Clear
0948	150	NA	19.87	6.74	224	2.23	-48.7	1.68	Clear
0953	150	NA	19.97	6.73	223	2.19	-49.1	1.67	Clear
0958	150	NA	19.96	6.74	220	2.17	-49.9	1.44	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size (micron): 10+0.45 Dup ID/Time: NA

Comments: Used 2 filters. Collected Sample at 1000. Post DTW = 19.60 feet.
Tubing intake at top of screen.

Kevin G. Anderson 8/16/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-07-65-67 **Geoprobe Sampler:** SP16

Project:	1081-005 Shepley's Hill Landfill	Date:	8/16/2017
Event:	Drilling Profile Samples	Sampler:	KGA
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	4.0
Depth to water (ft-bTOC)	19.28
Depth to bottom (ft bgs)	67
Screen Interval (ft-bgs)	65-67
Total volume purged (gal)	3.0
2 Well volumes purged (gal)	1.7

Sampling Type

Purging Method	Peristaltic	Tubing type	HDPE	Dedicated pump (Y/N)	N
Purge start/stop time	1140/1205	Tubing diameter	0.25 inch	Air source	N/A
				Field Instrument (Model/S/N)	YSI 556MPS
					Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1140	150	NA	17.19	6.67	146	6.15	-68.2	13.00	Clear
1145	150	NA	16.40	6.52	136	2.23	-55.3	2.73	Clear
1150	150	NA	16.33	6.42	135	0.80	-49.7	*	Clear
1155	150	NA	16.24	6.38	135	0.44	-43.6	6.44	Clear
1200	150	NA	16.26	6.37	135	0.26	-31.3	6.57	Clear
1205	150	NA	16.00	6.40	135	0.23	-36.7	6.66	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

Field Filtered (Y/N):	Y	Duplicate (Y/N):	N	MS/MSD (Y/N):	N
Filter Size (micron):	10+0.45	Dup ID/Time:	NA		

Comments: Used 2 filters. Collected Sample at 1210. Post DTW = 19.28 feet.
Tubing intake at top of screen. * Hach reading malfunction at this time.

Kevin G. Anderson 8/16/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-07-75-77 **Geoprobe Sampler:** SP16

Project:	1081-005 Shepley's Hill Landfill	Date:	8/16/2017
Event:	Drilling Profile Samples	Sampler:	KGA
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	4.0
Depth to water (ft-bTOC)	19.28
Depth to bottom (ft bgs)	77
Screen Interval (ft-bgs)	75-77
Total volume purged (gal)	3.0
2 Well volumes purged (gal)	2.0

Sampling Type

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

Purge start/stop time 1350/1415 Tubing diameter 0.25 inch Air source N/A

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1350	150	NA	18.21	5.93	168	5.06	90.6	2.66	Clear
1355	150	NA	19.33	5.86	172	2.28	73.6	2.01	Clear
1400	150	NA	20.04	6.11	178	1.57	56.9	2.09	Clear
1405	150	NA	19.73	6.13	179	1.41	41.2	2.04	Clear
1410	150	NA	19.14	6.17	186	1.30	37.9	2.10	Clear
1415	150	NA	19.17	6.18	188	1.17	34.6	2.03	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size (micron): 10+0.45 Dup ID/Time: NA

Comments: Used 2 filters. Collected Sample at 1420. Post DTW = 14.63 feet.
Tubing intake at top of screen.

Kevin G. Anderson 8/16/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-08-27-29 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/21/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.0
Depth to water (ft-bgs)	18.17
Depth to bottom (ft bgs)	29
Screen Interval (ft-bgs)	27-29
Total volume purged (gal)	3.0
2 Well Volumes purged (gal)	0.5

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N

Purge start/stop time 1245/1315 Tubing diameter 0.25 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1245	200	NA	16.08	7.32	982	9.87	89.5	12.0	Clear
1250	200	NA	15.30	6.85	963	1.47	97.2	9.87	Clear
1255	200	NA	15.06	6.83	951	0.73	98.2	9.90	Clear
1300	200	NA	15.23	6.88	956	0.49	100.9	3.87	Clear
1305	200	NA	14.94	6.90	952	0.43	104.7	3.86	Clear
1310	200	NA	14.97	6.91	951	0.42	106.9	3.86	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+0.45 Dup ID/Time: NA

Comments: Two filters were used. Collected sample at 1315. Post DTW = 18.68 ft.

Kevin Anderson 8/21/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-08-37-39 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/21/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.0
Depth to water (ft-bgs)	19.33
Depth to bottom (ft bgs)	39
Screen Interval (ft-bgs)	37-39
Total volume purged (gal)	2.0
2 Well Volumes purged (gal)	0.9

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N

Purge start/stop time 1415/1440 Tubing diameter 0.25 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1415	200	NA	18.10	7.95	583	2.14	5.6	13.01	Clear
1420	200	NA	15.65	7.84	574	0.96	11.6	11.09	Clear
1425	200	NA	15.90	7.62	577	0.46	10.5	11.03	Clear
1430	200	NA	16.61	7.63	586	0.44	9.7	11.01	Clear
1435	200	NA	16.70	7.62	589	0.43	9.4	11.00	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+0.45 Dup ID/Time: NA

Comments: Two filters were used. Collected sample at 1440. Post DTW = 19.46 ft.

Kevin Anderson 8/21/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-08-47-49 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/21/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.0
Depth to water (ft-bgs)	19.38
Depth to bottom (ft bgs)	49
Screen Interval (ft-bgs)	47-49
Total volume purged (gal)	2.5
2 Well Volumes purged (gal)	1.0

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N

Purge start/stop time 1532/1600 Tubing diameter 0.25 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1532	200	NA	16.42	9.00	523	7.39	31.5	4.60	Clear
1537	200	NA	15.08	9.42	493	1.42	42.4	3.36	Clear
1542	200	NA	14.48	9.42	485	0.73	33.4	2.62	Clear
1547	200	NA	14.40	9.44	483	0.40	28.0	2.21	Clear
1552	200	NA	14.40	9.45	482	0.33	25.3	2.21	Clear
1557	200	NA	14.57	9.47	483	0.32	23.9	2.19	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+0.45 Dup ID/Time: SB-2017-DUP-1/ 1610

Comments: Two filters were used. Collected sample at 1600. Post DTW = 19.38 ft.

Kevin Anderson 8/21/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-08-57-59 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/22/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.0
Depth to water (ft-bgs)	19.27
Depth to bottom (ft bgs)	59
Screen Interval (ft-bgs)	57-59
Total volume purged (gal)	3.5
2 Well Volumes purged (gal)	1.5

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N

Purge start/stop time 0841/0915 Tubing diameter 0.25 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
0841	200	NA	17.01	7.67	501	5.65	-4.3	18.4	Clear
0846	200	NA	15.91	6.58	496	1.34	13.3	11.1	Clear
0851	200	NA	16.00	6.57	495	0.77	8.0	6.22	Clear
0856	200	NA	16.25	6.61	497	0.57	3.0	6.36	Clear
0901	200	NA	16.24	6.74	497	0.38	-2.8	6.31	Clear
0906	200	NA	16.10	6.76	497	0.40	-2.4	6.29	Clear
0911	200	NA	16.25	6.79	498	0.34	-3.6	6.26	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+0.45 Dup ID/Time: NA

Comments: Two filters were used. Collected sample at 0915. Post DTW = 19.09 ft.

Kevin Anderson 8/22/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-08-67-69 **Geoprobe Sampler:** SP16

Project: 1081-004 Shepley's Hill Landfill Date: 8/22/2017
Event: Drilling Profile Samples Sampler: K. Anderson
Location: Fort Devens Massachusetts

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.0
Depth to water (ft-bgs)	20.03
Depth to bottom (ft bgs)	69
Screen Interval (ft-bgs)	67-69
Total volume purged (gal)	3.5
2 Well Volumes purged (gal)	1.6

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N
Purge start/stop time 1025/1055 Tubing diameter 0.25 inch Air source NA
Field Instrument (Model/S/N) YSI 556MPS
Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1025	200	NA	17.17	6.87	518	2.12	-3.5	6.78	Clear
1030	200	NA	17.47	6.79	523	1.05	-6.6	5.62	Clear
1035	200	NA	17.71	6.95	527	0.60	-14.8	6.02	Clear
1040	200	NA	17.59	7.07	527	0.36	-18.8	5.49	Clear
1045	200	NA	17.60	7.09	525	0.32	-19.8	5.88	Clear
1050	200	NA	17.47	7.10	524	0.30	-21.0	5.90	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size Used: 10+0.45 Dup ID/Time: NA

Comments: Two filters were used. Collected sample at 1055. Post DTW = 19.64 ft.

Kevin Anderson 8/22/2017
Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-08-77-79 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/22/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.0
Depth to water (ft-bgs)	19.67
Depth to bottom (ft bgs)	79
Screen Interval (ft-bgs)	77-79
Total volume purged (gal)	4.0
2 Well Volumes purged (gal)	2.0

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N

Purge start/stop time 1210/1240 Tubing diameter 0.25 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1210	200	NA	18.82	7.41	590	6.39	-61.5	11.22	Clear
1215	200	NA	17.79	6.95	569	1.34	-33.1	10.91	Clear
1220	200	NA	17.47	6.93	567	0.64	-30.6	7.73	Clear
1225	200	NA	17.79	6.94	571	0.37	-34.7	7.69	Clear
1230	200	NA	17.82	6.98	571	0.30	-37.2	7.67	Clear
1235	200	NA	17.73	6.97	571	0.27	-39.8	7.62	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+0.45 Dup ID/Time: NA

Comments: Two filters were used. Collected sample at 1240. Post DTW = 19.47 ft.

Kevin Anderson 8/22/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-08-87-89 **Geoprobe Sampler:** SP16

Project: 1081-004 Shepley's Hill Landfill Date: 8/22/2017
Event: Drilling Profile Samples Sampler: K. Anderson
Location: Fort Devens Massachusetts

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.0
Depth to water (ft-bgs)	19.73
Depth to bottom (ft bgs)	89
Screen Interval (ft-bgs)	87-89
Total volume purged (gal)	4.0
2 Well Volumes purged (gal)	2.3

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N
Purge start/stop time 1541/1610 Tubing diameter 0.25 inch Air source NA
Field Instrument (Model/S/N) YSI 556MPS
Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1541	200	NA	18.36	7.91	526	2.49	-81.5	8.60	Clear
1546	200	NA	19.02	7.61	532	1.60	-75.5	8.89	Clear
1551	200	NA	19.12	7.46	534	0.75	-75.1	8.93	Clear
1556	200	NA	18.96	7.41	533	0.45	-74.4	8.92	Clear
1601	200	NA	18.03	7.38	521	0.27	-72.5	8.90	Clear
1606	200	NA	17.93	7.34	517	0.23	-67.0	8.88	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size Used: 10+0.45 Dup ID/Time: NA

Comments: Two filters were used. Collected sample at 1610. Post DTW = 18.25 ft.
Low florw from 2nd attempt, first attempt the screen failed to deploy

Kevin Anderson 8/22/2017
Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-08-94.6-96.6 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/23/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	0.5
Depth to water (ft-bgs)	20.73
Depth to bottom (ft bgs)	96.6
Screen Interval (ft-bgs)	94.6-96.6
Total volume purged (gal)	4.0
2 Well Volumes purged (gal)	2.5

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N

Purge start/stop time 0952/1025 Tubing diameter 0.25 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
0952	200	NA	15.24	7.63	478	4.02	-34.6	4.37	Clear
0957	200	NA	15.53	7.05	480	2.15	-23.0	3.54	Clear
1002	200	NA	16.36	7.08	490	1.27	-31.7	3.69	Clear
1007	200	NA	16.04	7.19	488	1.01	-38.5	3.73	Clear
1012	200	NA	16.12	7.29	489	0.60	-43.7	3.71	Clear
1017	200	NA	16.48	7.32	492	0.45	-47.4	3.74	Clear
1022	200	NA	16.56	7.34	494	0.43	-48.6	3.77	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+0.45 Dup ID/Time: NA

Comments: Two filters were used. Collected sample at 1025. Post DTW = 17.21 ft.

Kevin Anderson 8/23/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-09-22-24 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/23/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	15.08
Depth to bottom (ft bgs)	24
Screen Interval (ft-bgs)	22-24
Total volume purged (gal)	2.0
2 Well Volumes purged (gal)	0.4

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N

Purge start/stop time 1338/1405 Tubing diameter 0.25 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1338	150	NA	16.92	7.12	752	1.83	34.9	6.65	Clear
1343	150	NA	15.75	6.83	747	0.99	38.8	5.39	Clear
1348	150	NA	15.76	6.85	749	0.67	33.0	4.26	Clear
1353	150	NA	15.27	6.89	732	0.45	34.0	4.19	Clear
1358	150	NA	14.76	6.90	721	0.30	33.6	4.18	Clear
1403	150	NA	14.80	6.91	720	0.29	33.5	4.17	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+0.45 Dup ID/Time: NA

Comments: Two filters were used. Collected sample at 1405. Post DTW = 16.08 ft.

Kevin Anderson 8/23/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-09-32-34 **Geoprobe Sampler:** SP16

Project: 1081-004 Shepley's Hill Landfill Date: 8/23/2017
Event: Drilling Profile Samples Sampler: K. Anderson
Location: Fort Devens Massachusetts

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	15.11
Depth to bottom (ft bgs)	34
Screen Interval (ft-bgs)	32-34
Total volume purged (gal)	2.0
2 Well Volumes purged (gal)	0.7

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N
Purge start/stop time 1500/1530 Tubing diameter 0.25 inch Air source NA
Field Instrument (Model/S/N) YSI 556MPS
Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1500	150	NA	16.63	7.13	314	1.08	24.7	6.54	Clear
1505	150	NA	15.34	6.79	312	0.41	33.2	5.36	Clear
1510	150	NA	15.34	6.77	313	0.23	28.9	5.21	Clear
1515	150	NA	15.21	6.85	313	0.20	23.5	4.97	Clear
1520	150	NA	15.23	6.86	314	0.19	22.1	4.96	Clear
1525	150	NA	15.24	6.87	315	0.18	22.0	4.93	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

Field Filtered (Y/N): Y Duplicate (Y/N): Y MS/MSD (Y/N): N
Filter Size Used: 10+0.45 Dup ID/Time: SB-2017-DUP-2/ 1535

Comments: Two filters were used. Collected sample at 1530. Post DTW = 15.37 ft.

Kevin Anderson 8/23/2017
Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-09-42-44 **Geoprobe Sampler:** SP16

Project: 1081-004 Shepley's Hill Landfill Date: 8/24/2017
Event: Drilling Profile Samples Sampler: K. Anderson
Location: Fort Devens Massachusetts

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	14.99
Depth to bottom (ft bgs)	44
Screen Interval (ft-bgs)	42-44
Total volume purged (gal)	2.0
2 Well Volumes purged (gal)	1.0

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N
Purge start/stop time 0900/0945 Tubing diameter 0.25 inch Air source NA
Field Instrument (Model/S/N) YSI 556MPS
Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
0900	150	NA	15.23	7.40	737	4.73	21.0	25.5	Clear
0905	150	NA	15.60	7.18	748	2.53	8.2	6.38	Clear
0910	150	NA	15.35	7.11	747	2.84	0.7	4.47	Clear
0915	150	NA	15.35	7.06	745	2.31	0.1	4.09	Clear
0920	150	NA	15.43	7.02	744	1.79	-3.4	4.26	Clear
0925	150	NA	15.62	7.02	746	1.31	-7.0	4.39	Clear
0930	150	NA	15.62	7.03	748	1.11	-9.6	4.32	Clear
0935	150	NA	15.65	7.02	748	1.09	-9.8	4.31	Clear
0940	150	NA	15.79	7.03	749	0.99	-11.6	4.30	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

Field Filtered (Y/N): Y Duplicate (Y/N): NA MS/MSD (Y/N): Y
Filter Size Used: 10+5+0.45 Dup ID/Time: NA

Comments: Three filters were used. Collected sample at 0945. Post DTW = 20.07 ft.

Kevin Anderson 8/24/2017
Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-09-52-54 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/24/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	17.14
Depth to bottom (ft bgs)	54
Screen Interval (ft-bgs)	52-54
Total volume purged (gal)	3.0
2 Well Volumes purged (gal)	1.2

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N

Purge start/stop time 1125/1205 Tubing diameter 0.25 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1125	200	NA	14.68	7.07	855	1.36	-20.5	10.22	Clear
1130	200	NA	14.43	7.09	848	0.40	-24.8	12.55	Clear
1135	200	NA	15.11	7.13	860	1.74	-25.5	6.06	Clear
1140	200	NA	14.23	7.22	845	1.45	-27.0	6.47	Clear
1145	200	NA	14.37	7.17	847	0.94	-23.9	6.69	Clear
1150	200	NA	14.48	7.18	851	0.83	-24.3	6.63	Clear
1155	200	NA	14.57	7.23	853	0.35	-27.3	6.40	Clear
1200	200	NA	14.30	7.24	848	0.38	-26.3	6.56	Clear
1205	200	NA	14.37	7.22	849	0.34	-24.3	6.47	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10++5+0.45 Dup ID/Time: NA

Comments: Three filters were used. Collected sample at 1210. Post DTW = 16.52 ft.

Kevin Anderson 8/24/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-09-62-64 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/24/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	16.64
Depth to bottom (ft bgs)	64
Screen Interval (ft-bgs)	62-64
Total volume purged (gal)	4.0
2 Well Volumes purged (gal)	1.6

Sampling Type

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

Purge start/stop time: 1314/1344 Tubing diameter: 0.25 inch Air source: NA

Field Instrument (Model/S/N): YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1314	175	NA	16.62	7.15	572	2.64	-32.3	7.91	Clear
1319	175	NA	15.21	6.99	559	1.47	-30.6	5.05	Clear
1324	175	NA	15.05	7.02	556	0.98	-31.9	5.24	Clear
1329	175	NA	15.18	7.04	558	0.49	-33.8	5.47	Clear
1334	175	NA	15.03	7.08	557	0.31	-36.4	5.51	Clear
1339	175	NA	15.02	7.08	557	0.26	-38.0	5.51	Clear
1344	175	NA	15.13	7.07	557	0.25	-38.7	5.59	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+0.45 Dup ID/Time: NA

Comments: Two filters were used. Collected sample at 1350. Post DTW = 12.12 ft.

Kevin Anderson 8/24/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-10-22-24 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/24/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	15.21
Depth to bottom (ft bgs)	24
Screen Interval (ft-bgs)	22-24
Total volume purged (gal)	2.0
2 Well Volumes purged (gal)	0.2

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N

Purge start/stop time 1535/1605 Tubing diameter 0.25 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1535	200	NA	15.25	7.31	664	3.79	83.9	6.94	Clear
1540	200	NA	14.79	6.72	654	1.08	72.6	6.80	Clear
1545	200	NA	14.46	6.73	651	0.78	57.3	6.78	Clear
1550	200	NA	14.15	6.70	643	0.59	52.4	6.66	Clear
1555	200	NA	14.39	6.74	644	0.27	48.2	6.53	Clear
1600	200	NA	14.29	6.76	641	0.24	46.8	6.51	Clear
1605	200	NA	14.27	6.82	640	0.23	46.5	6.47	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+0.45 Dup ID/Time: NA

Comments: Two filters were used. Collected sample at 1610. Post DTW = 14.63 ft.

Kevin Anderson 8/24/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-10-32-34 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/25/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	16.04
Depth to bottom (ft bgs)	34
Screen Interval (ft-bgs)	32-34
Total volume purged (gal)	2.5
2 Well Volumes purged (gal)	0.6

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N

Purge start/stop time 0842/0912 Tubing diameter 0.25 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
0842	150	NA	17.64	8.13	186	3.08	37.6	7.57	Clear
0847	150	NA	13.40	7.13	184	1.61	58.4	5.42	Clear
0852	150	NA	12.05	7.00	175	0.90	50.5	4.87	Clear
0857	150	NA	11.88	6.84	172	0.43	56.1	5.13	Clear
0902	150	NA	11.72	6.83	170	0.35	53.6	5.30	Clear
0907	150	NA	11.72	6.90	169	0.29	53.0	5.36	Clear
0912	150	NA	11.74	6.91	168	0.26	52.6	5.33	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+0.45 Dup ID/Time: NA

Comments: Two filters were used. Collected sample at 0915. Post DTW = 12.98 ft.

Kevin Anderson 8/25/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-10-42-44 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/25/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	16.34
Depth to bottom (ft bgs)	44
Screen Interval (ft-bgs)	42-44
Total volume purged (gal)	3.0
2 Well Volumes purged (gal)	1.0

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE

Purge start/stop time 1015/1045 Tubing diameter 0.25 inch

Dedicated pump (Y/N) N

Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1015	150	NA	13.12	7.12	544	3.31	18.5	8.95	Clear
1020	150	NA	12.66	6.70	542	1.73	13.3	7.55	Clear
1025	150	NA	12.72	6.74	542	0.81	6.2	6.50	Clear
1030	150	NA	13.41	6.85	555	0.77	-4.3	5.37	Clear
1035	150	NA	12.73	6.90	548	0.39	-10.7	5.44	Clear
1040	150	NA	12.87	9.91	549	0.43	-8.5	5.39	Clear
1045	150	NA	12.86	6.92	549	0.42	-8.2	5.37	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+0.45 Dup ID/Time: DUP-03/1100

Comments: Two filters were used. Collected sample at 1050. Post DTW = 15.28 ft.

Kevin Anderson 8/25/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-10-52-54 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/25/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	14.97
Depth to bottom (ft bgs)	54
Screen Interval (ft-bgs)	52-54
Total volume purged (gal)	3.5
2 Well Volumes purged (gal)	1.3

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N

Purge start/stop time 1214/1247 Tubing diameter 0.25 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1214	200	NA	15	6.52	513	1.61	136.9	12.07	Clear
1219	200	NA	15.18	6.62	517	1.09	116.9	9.45	Clear
1224	200	NA	15.40	6.71	524	0.72	105.2	7.71	Clear
1229	200	NA	15.50	6.79	527	0.59	96.2	6.18	Clear
1234	200	NA	15.57	6.82	529	0.42	92.4	6.57	Clear
1239	200	NA	15.18	6.87	530	0.30	85.9	6.49	Clear
1244	200	NA	15.11	6.92	527	0.24	83.2	6.41	Clear
1247	200	NA	15.13	9.94	526	0.23	82.9	6.39	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+0.45 Dup ID/Time: N

Comments: Two filters were used. Collected sample at 1250. Post DTW = 15.07 ft.

Kevin Anderson 8/25/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-10-62-64 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/25/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	14.33
Depth to bottom (ft bgs)	64
Screen Interval (ft-bgs)	62-64
Total volume purged (gal)	3.5
2 Well Volumes purged (gal)	1.7

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N

Purge start/stop time 1347/1412 Tubing diameter 0.25 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1347	200	NA	14.87	7.35	413	3.39	-43.1	6.11	Clear
1352	200	NA	14.54	6.85	406	0.84	-27.8	5.41	Clear
1357	200	NA	14.80	6.89	408	0.44	-35.1	5.37	Clear
1402	200	NA	14.90	6.94	409	0.37	-38.6	5.26	Clear
1407	200	NA	14.82	6.98	407	0.30	-39.7	5.24	Clear
1412	200	NA	14.47	9.96	406	0.31	-41.0	5.23	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+0.45 Dup ID/Time: N

Comments: Two filters were used. Collected sample at 1415. Post DTW = 16.43 ft.

Kevin Anderson 8/25/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-10-72-74 **Geoprobe Sampler:** SP16

Project:	1081-004 Shepley's Hill Landfill	Date:	8/25/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	15.41
Depth to bottom (ft bgs)	74
Screen Interval (ft-bgs)	72-74
Total volume purged (gal)	2.5
2 Well Volumes purged (gal)	2.0

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N

Purge start/stop time 1543/1603 Tubing diameter 0.25 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1543	100	NA	18.84	6.77	488	4.03	-26.4	4.94	Clear
1548	100	NA	18.90	6.75	493	2.53	-30.7	4.96	Clear
1553	100	NA	18.87	6.74	497	2.52	-31.5	4.96	Clear
1558	100	NA	18.86	6.75	498	2.50	-32.6	4.74	Clear
1603	100	NA	18.89	6.75	499	2.49	-33.3	4.93	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+5+0.45 Dup ID/Time: N

Comments: THREE filters were used. Collected sample at 1610. Post DTW = 16.64 ft.

Kevin Anderson 8/25/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/ Low Stress Groundwater Sampling Log

Well Identification: SB-2017-11-22-24 **Geoprobe Sampler:** SP16

Project: 1081-005 Shepley's Hill Landfill Date: 8/28/2017
Event: Drilling Profile Samples Sampler: KMH
Location: Fort Devens Massachusetts

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	19.81
Depth to bottom (ft bgs)	24
Screen Interval (ft-bgs)	22-24
Total volume purged (gal)	3.0
2 Well volumes purged (gal)	0.2

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N
Purge start/stop time 1108/1135 Tubing diameter 0.25 inch Air source NA
Field Instrument (Model/S/N) YSI 556
Hach 2100Q

Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1108	200	NA	19.82	1.23	101	10.32	315.1	21.7	clear
1113	200	NA	21.26	3.10	103	7.45	237	6.3	clear
1119	200	NA	18.65	2.98	99	6.27	185.1	3.91	clear
1125	250	NA	20.16	2.96	99	7.40	181.3	2.87	clear
1130	250	NA	20.53	2.92	99	7.42	183.1	2.32	clear
1135	250	NA	20.91	2.91	99	7.41	182.6	1.92	clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size (Micron): 10+5+0.45 Dup ID/Time: NA

Comments: Sample collected at 1140. No final DTW collected, driller pulled rod before a measurement was taken.
10 and 5 micron filter(s) used. Open BH collapsed, no measurement. Lab analysis for pH due to low readings.

Kerk Halberg 8/28/2017
Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/ Low Stress Groundwater Sampling Log

Well Identification: SB-2017-11-32-34 **Geoprobe Sampler:** SP16

Project: 1081-005 Shepley's Hill Landfill Date: 8/28/2017
Event: Drilling Profile Samples Sampler: KMH
Location: Fort Devens Massachusetts

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.0
Depth to water (ft-bgs)	19.32
Depth to bottom (ft bgs)	34
Screen Interval (ft-bgs)	32-34
Total volume purged (gal)	5.0
2 Well volumes purged (gal)	0.5

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N
Purge start/stop time 1240/1310 Tubing diameter 0.25 inch Air source NA
Field Instrument (Model/S/N) YSI 556
Hach 2100Q

Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1240	200	NA	14.19	1.97	111	10.05	346.2	3.91	clear
1245	200	NA	13.91	2.40	109	4.76	196.9	3.94	clear
1250	200	NA	16.69	1.81	119	4.23	231.7	8.22	clear
1255	200	NA	17.02	1.94	121	3.72	226.9	2.17	clear
1300	200	NA	16.81	1.89	121	2.96	226.8	2.03	clear
1305	200	NA	17.13	1.85	118	2.73	226.3	1.98	clear
1310	200	NA	17.10	1.84	120	2.85	225.5	1.93	clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

Field Filtered (Y/N): Y Duplicate (Y/N): Y MS/MSD (Y/N): N
Filter Size (Micron): 0.45 Dup ID/Time: FD-04 1325

Comments: Sample collected at 1315. FD-04 Collected at 1325. 10 and 5 micron filter(s) used.
DTW in well after purging 18.81 ft. Borehole collapsed upon removal of rods.

Kerk Halberg 8/28/2017
Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/ Low Stress Groundwater Sampling Log

Well Identification: SB-2017-11-42-44 **Geoprobe Sampler:** SP16

Project: 1081-005 Shepley's Hill Landfill Date: 8/28/2017
Event: Drilling Profile Samples Sampler: KMH
Location: Fort Devens Massachusetts

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.0
Depth to water (ft-bgs)	19.3
Depth to bottom (ft bgs)	44
Screen Interval (ft-bgs)	42-44
Total volume purged (gal)	3.5
2 Well volumes purged (gal)	0.8

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N
Purge start/stop time 1420/1445 Tubing diameter 0.25 inch Air source NA
Field Instrument (Model/S/N) YSI 556
Hach 2100Q

Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1420	200	NA	12.40	6.73	210	1.44	-48.2	4.35	clear
1425	200	NA	12.48	6.76	213	0.95	-64.7	3.62	clear
1430	200	NA	12.89	6.77	212	0.89	-76.3	3.44	clear
1435	200	NA	13.03	6.79	212	1.01	-78.2	3.12	clear
1440	200	NA	13.12	6.78	211	1.00	-74.3	3.10	clear
1445	200	NA	13.23	6.75	213	0.98	-78.6	2.98	clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): Y
Filter Size (Micron): 10+0.45 Dup ID/Time: NA

Comments: Sample collected at 1315. MS/MSD collected. Two filter(s) used.
DTW in well after purging 18.83 ft. Borehole collapsed upon removal of rods.

Kerk Halberg 8/28/2017
Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/ Low Stress Groundwater Sampling Log

Well Identification: SB-2017-11-52-54 **Geoprobe Sampler:** SP16

Project: 1081-005 Shepley's Hill Landfill Date: 8/28/2017
Event: Drilling Profile Samples Sampler: KMH
Location: Fort Devens Massachusetts

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.0
Depth to water (ft-bgs)	18.92
Depth to bottom (ft bgs)	54
Screen Interval (ft-bgs)	52-54
Total volume purged (gal)	3.25
2 Well volumes purged (gal)	1.2

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N
Purge start/stop time 1550/1620 Tubing diameter 0.25 inch Air source NA
Field Instrument (Model/S/N) YSI 556
Hach 2100Q

Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1550	200	NA	15.06	6.80	622	12.59	-68.6	3.17	clear
1555	200	NA	14.12	6.82	618	7.36	-65.2	3.05	clear
1600	200	NA	13.40	6.85	586	2.01	-63.5	2.98	clear
1605	200	NA	13.39	6.86	587	1.74	-63.6	2.82	clear
1610	200	NA	12.82	6.87	581	1.72	-61.9	3.37	clear
1615	200	NA	12.58	6.86	578	1.96	-66.3	3.35	clear
1620	200	NA	12.57	6.86	578	1.85	-68.6	3.12	clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size (Micron): 10+0.45 Dup ID/Time: NA

Comments: Sample collected at 1625. two micron filters used.
DTW in well after purging 19.12 ft. Borehole collapsed upon removal of rods.

Kerk Halberg 8/28/2017
Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/ Low Stress Groundwater Sampling Log

Well Identification: SB-2017-11-62-64 **Geoprobe Sampler:** SP16

Project: 1081-005 Shepley's Hill Landfill Date: 8/29/2017
Event: Drilling Profile Samples Sampler: KMH
Location: Fort Devens Massachusetts

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.0
Depth to water (ft-bgs)	19.25
Depth to bottom (ft bgs)	64
Screen Interval (ft-bgs)	62-64
Total volume purged (gal)	3.0
2 Well volumes purged (gal)	1.5

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N
Purge start/stop time 0920/0945 Tubing diameter 0.25 inch Air source NA
Field Instrument (Model/S/N) YSI 556
Hach 2100Q

Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
0920	200	NA	10.86	6.73	544	5.56	-92.6	10.1	clear
0925	200	NA	10.67	6.74	512	2.65	-84.8	5.09	clear
0930	200	NA	10.65	6.74	504	2.28	-88.9	3.54	clear
0935	200	NA	10.66	6.74	500	1.87	-90.1	3.42	clear
0940	200	NA	10.70	6.74	500	1.85	-90.7	3.31	clear
0945	200	NA	10.78	6.74	501	1.81	-88.9	3.29	clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size (Micron): 10+0.45 Dup ID/Time: NA

Comments: Sample collected at 0950. Two micron filters used.
DTW in well after purging 17.10 ft. Borehole collapsed upon removal of rods.

Kerk Halberg 8/28/2017
Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/ Low Stress Groundwater Sampling Log

Well Identification: SB-2017-11-72-74 **Geoprobe Sampler:** SP16

Project: 1081-005 Shepley's Hill Landfill Date: 8/29/2017
Event: Drilling Profile Samples Sampler: KMH
Location: Fort Devens Massachusetts

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.0
Depth to water (ft-bgs)	20.9
Depth to bottom (ft bgs)	74
Screen Interval (ft-bgs)	72-74
Total volume purged (gal)	2.5
2 Well volumes purged (gal)	1.8

Sampling Type

Purging Method Peristaltic Pump Tubing type HDPE Dedicated pump (Y/N) N
Purge start/stop time 1040/1105 Tubing diameter 0.25 inch Air source NA
Field Instrument (Model/S/N) YSI 556
Hach 2100Q

Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1040	200	NA	12.98	6.65	438	6.26	-86.3	15.1	clear
1045	200	NA	12.34	6.80	427	2.36	-96.6	1.84	clear
1050	200	NA	12.09	6.83	425	1.51	-97.7	3.24	clear
1055	200	NA	12.12	6.84	424	1.19	-95.9	3.10	clear
1100	200	NA	12.22	6.84	425	0.98	-96.3	2.93	clear
1105	200	NA	12.24	6.85	424	0.99	-97.1	3.03	clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size (Micron): 10+0.45 Dup ID/Time: NA

Comments: Sample collected at 1110. Two micron filter(s) used.
DTW in well after purging 19.0 ft. Borehole collapsed upon removal of rods.

Kerk Halberg 8/29/2017
Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-12-42-44 **Geoprobe Sampler:** SP16

Project:	1081-005 Shepley's Hill Landfill	Date:	8/28/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	31.55
Depth to bottom (ft bgs)	44
Screen Interval (ft-bgs)	42-44
Total volume purged (gal)	3.0
2 Wells volume purged (gal)	0.5

Sampling Type

Purging Method Waterra Hydrolift Tubing type LDPE Dedicated pump (Y/N) N

Purge start/stop time 1335/1405 Tubing diameter 3/8 x 1/2 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1335	200	NA	12.64	8.37	114	3.31	140.8	4.38	Clear
1340	200	NA	12.36	7.36	110	1.84	135.2	3.53	Clear
1345	200	NA	12.58	7.06	106	1.09	117.4	3.50	Clear
1350	200	NA	12.49	6.95	103	0.85	106.9	3.37	Clear
1355	200	NA	12.36	6.85	102	0.66	103.2	3.47	Clear
1400	200	NA	12.47	6.84	101	0.57	99.7	3.50	Clear
1405	200	NA	12.46	6.83	100	0.55	96.8	3.52	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+0.45 Dup ID/Time: NA

Comments: Two filters were used. Collected sample at 1410. Post DTW = 31.31 feet.

Kevin Anderson 8/28/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-12-52-54 **Geoprobe Sampler:** SP16

Project:	1081-005 Shepley's Hill Landfill	Date:	8/28/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	31.69
Depth to bottom (ft bgs)	54'
Screen Interval (ft-bgs)	52-54'
Total volume purged (gal)	2.5
2 Well volume purged (gal)	0.8

Sampling Type

Purging Method Waterra Hydrolift Tubing type LDPE Dedicated pump (Y/N) N

Purge start/stop time 1520/1550 Tubing diameter 3/8 x 1/2 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1520	200	NA	15.85	6.85	142	5.11	77.3	4.58	Clear
1525	200	NA	15.80	6.39	144	3.97	82.9	4.34	Clear
1530	200	NA	16.27	6.31	150	2.76	72.7	4.29	Clear
1535	200	NA	16.87	6.61	156	2.13	53.6	4.23	Clear
1540	200	NA	17.03	6.64	161	1.70	37.6	4.19	Clear
1545	200	NA	17.14	6.64	162	1.67	33.4	4.17	Clear
1550	200	NA	17.27	6.66	163	1.64	32.1	4.10	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+5+0.45 Dup ID/Time: NA

Comments: Three filters were used. Collected sample at 1555. Post DTW = 31.8 feet.

Kevin Anderson 8/28/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-12-62-64 **Geoprobe Sampler:** SP16

Project:	1081-005 Shepley's Hill Landfill	Date:	8/29/2017
Event:	Drilling Profile Samples	Sampler:	K/ Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	31.44
Depth to bottom (ft bgs)	64
Screen Interval (ft-bgs)	62-64
Total volume purged (gal)	2.0
2 Well volume purged (gal)	1.2

Sampling Type

Purging Method Waterra Hydrolift Tubing type HDPE Dedicated pump (Y/N) N

Purge start/stop time 0905/0930 Tubing diameter 3/8x1/2 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
0905	200	NA	10.95	7.03	235	3.28	81.1	7.70	Clear
0910	200	NA	11.37	6.68	239	2.25	55.6	7.72	Clear
0915	200	NA	12.03	6.86	243	2.09	34.1	7.69	Clear
0920	200	NA	12.02	6.87	245	2.00	31.6	7.68	Clear
0925	200	NA	12.09	6.87	246	1.98	30.6	8.90	Clear
0930	200	NA	12.11	6.87	247	1.97	29.8	8.82	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+5+5+0.45 Dup ID/Time: NA

Comments: Four filters were used. Collected sample at 0935. Post DTW = 31.56 feet.

Kevin Anderson 8/29/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-12-72-74 **Geoprobe Sampler:** SP16

Project:	1081-005 Shepley's Hill Landfill	Date:	8/29/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	31.45
Depth to bottom (ft bgs)	74
Screen Interval (ft-bgs)	72-74
Total volume purged (gal)	3.5
2 Well volume purged (gal)	1.0

Sampling Type

Purging Method Waterra Hydrolift Tubing type LDPE Dedicated pump (Y/N) N

Purge start/stop time 1055/1125 Tubing diameter 3/8X1/2 inch Air source NA

Field Instrument (Model/S/N) YSI 556MPS

Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1055	200	NA	11.85	6.91	239	2.63	96.0	7.08	Clear
1100	200	NA	13.10	6.61	248	1.87	67.9	4.78	Clear
1105	200	NA	13.53	6.78	253	1.19	46.8	5.01	Clear
1110	200	NA	13.55	6.87	257	0.97	36.0	4.50	Clear
1115	200	NA	13.47	6.91	260	0.62	29.5	4.43	Clear
1120	200	NA	13.64	6.93	262	0.62	23.0	4.20	Clear
1125	200	NA	13.73	6.96	265	0.61	21.6	4.27	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

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

Filter Size Used: 10+5+0.45 Dup ID/Time: NA

Comments: Three filters were used. Collected sample at 1130. Post DTW = 31.45 feet.

Kevin Anderson 8/29/2017

Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-12-82-84 **Geoprobe Sampler:** SP16

Project: 1081-005 Shepley's Hill Landfill Date: 8/29/2017
Event: Drilling Profile Samples Sampler: K. Anderson
Location: Fort Devens Massachusetts

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	31.68
Depth to bottom (ft bgs)	84'
Screen Interval (ft-bgs)	82-84'
Total volume purged (gal)	3.0
2 Well volume purged (gal)	1.8

Sampling Type

Purging Method Waterra Pump Tubing type LDPE Dedicated pump (Y/N) N
Purge start/stop time 1325/1355 Tubing diameter 3/8x1/2 inch Air source NA
Field Instrument (Model/S/N) YSI 556MPS
Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1325	200	NA	13.43	7.03	363	4.44	188.8	6.40	Clear
1330	200	NA	14.34	6.49	375	2.22	187.2	4.58	Clear
1335	200	NA	15.02	6.59	383	1.83	171.8	4.49	Clear
1340	200	NA	15.66	6.72	390	1.46	161.6	4.59	Clear
1345	200	NA	16.29	6.83	397	1.28	154.6	4.50	Clear
1350	200	NA	16.22	6.86	402	1.14	151.3	4.29	Clear
1355	200	NA	16.75	6.87	404	1.11	150.9	4.27	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

Sampling Details

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size Used: 10+5+0.45 Dup ID/Time: NA

Comments: Three filters were used. Collected sample at 1400. Post DTW = 31.45

Kevin Anderson 8/29/2017
Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-12-92-94 **Geoprobe Sampler:** SP16

Project: 1081-005 Shepley's Hill Landfill Date: 8/29/2017
Event: Drilling Profile Samples Sampler: K. Anderson
Location: Fort Devens Massachusetts

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.3
Depth to water (ft-bgs)	31.14
Depth to bottom (ft bgs)	94'
Screen Interval (ft-bgs)	92-94'
Total volume purged (gal)	4
2 Well volumes purged (gal)	2.4

Sampling Type

Purging Method Waterra Hydrolift Tubing type HDPE Dedicated pump (Y/N) N
Purge start/stop time 1525/1605 Tubing diameter 3/8x1/2 inch Air source NA
Field Instrument (Model/S/N) YSI 556MPS
Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
1525	200	NA	13.92	7.30	427	5.64	175.3	64	Clear
1530	200	NA	13.47	6.80	427	1.92	200.0	31.6	Clear
1535	200	NA	13.21	6.80	428	1.41	97.6	20	Clear
1540	200	NA	13.45	6.89	437	0.59	56.6	--	Clear
1545	200	NA	replaced all filters						
1555	200	NA	12.91	6.90	451	0.47	-3.1	8.17	Clear
1600	200	NA	12.73	6.91	447	0.43	-3.3	7.90	Clear
1605	200	NA	12.68	6.92	445	0.42	-3.7	7.96	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

ampling Details

Field Filtered (Y/N): Y Duplicate (Y/N): N MS/MSD (Y/N): N
Filter Size Used: 10+5+5+1+1+0.45 Dup ID/Time: NA
0.45 1 5 10

Comments: Six filters were used. Collected sample at 1610. Post DTW = 31.21 feet.

Kevin Anderson 8/29/2017
Signature Date

KOMAN GOVERNMENT SOLUTIONS LLC

Low Flow/Low Stress Groundwater Sampling Log

Well Identification: SB-2017-12-99-101 **Geoprobe Sampler:** SP16

Project:	1081-005 Shepley's Hill Landfill	Date:	8/30/2017
Event:	Drilling Profile Samples	Sampler:	K. Anderson
Location:	Fort Devens Massachusetts		

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/Material	0.625"/PVC
Stickup (ft-bgs)	2.0
Depth to water (ft-bgs)	31.14
Depth to bottom (ft bgs)	100
Screen Interval (ft-bgs)	99-101
Total volume purged (gal)	3.0
2 Well volume purged (gal)	2.3

Sampling Type

Purging Method	Waterra	Tubing type	LDPE	Dedicated pump (Y/N)	N
Purge start/stop time	0943/1008	Tubing diameter	3/8 x 1/2 inch	Air source	NA
				Field Instrument (Model/S/N)	YSI 556MPS
					Hach 2100Q

Low Flow Stabilization Parameters

Time (hhmm)	Flow Rate (ml/min)	Depth to Water (ft)	Temp (ºC)	pH (STD)	SPC (µS/cm^c)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color/Clarity
0943	100	NA	13.77	7.52	397	7.39	221.5	2.75	Clear
0948	100	NA	13.94	7.41	399	6.47	224.0	3.48	Clear
0952	100	NA	14.23	7.44	402	5.78	223.1	4.02	Clear
0958	100	NA	14.48	7.47	407	5.01	221.4	4.07	Clear
1003	100	NA	14.50	7.48	406	4.99	220.4	4.06	Clear
1008	100	NA	14.90	7.50	414	4.89	217.9	4.14	Clear
Acceptance Criteria:		<0.3ft	±3%	±0.1	±3%	±10%	± 10mv	10%	

0.625-inch diameter tooling volume = 0.02 gal/ft or 60 ml per foot

ampling Details

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

Filter Size Used: 10+5+5+1+1+0.45 Dup ID/Time: NA

Comments: A total of 13 filters were used. Collected sample at 1010. Post DTW = 32.34 ft.

Kevin Anderson 8/30/2017

Signature Date

Devens

Created	2020-10-26 14:35:25 UTC by Chip Pipala
Updated	2020-10-26 15:11:44 UTC by Chip Pipala
Location	42.5583348, -71.5983187

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	Devens
Model	YSI ProDSS
Serial Number(s)	15E102911, 17E101954
Sampler	Eric Fowler
Date	2020-10-26
Calibration Type?	Single Point Calibration

Single Point Calibration

Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

10:48

Calibration Range for pH - +/- 0.2 S.U	
Time	10:48
pH Pre Calibration	5.94
pH Post Calibration	7.06
pH Calibration Within Range	No

10:51

Calibration Range for pH - +/- 0.2 S.U	
Time	10:51
pH Pre Calibration	8.55
pH Post Calibration	10.18
pH Calibration Within Range	Yes

10:57

Calibration Range for pH - +/- 0.2 S.U	
Time	10:57
pH Pre Calibration	7.9
pH Post Calibration	7.06
pH Calibration Within Range	Yes

0.002

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	11:02
Conductivity Pre Calibration	0.002
Conductivity Post Calibration	0.002
Conductivity Calibration Within Range	Yes

250.2

Calibration Range for ORP- +/- 25mV	
Time	11:08
ORP Pre Calibration	250.2
ORP Post Calibration	250.2
ORP Calibration Within Range	Yes

93.8

Calibration Range for DO- Atmospheric	
Time	10:38
DO Pre Calibration	93.8
DO Post Calibration	100.4
DO Calibration Within Range	Yes

5.2

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	10:40
Turbidity Pre Calibration	5.2
Turbidity Post Calibration	0
Turbidity Calibration Within Range	Yes

Signed

Signed 2020-10-26 15:11:15 UTC

Date	2020-10-26

10/26

Created	2020-10-26 12:25:12 UTC by Nicholas Burch
Updated	2020-10-26 13:06:31 UTC by Nicholas Burch
Location	42.5584203843681, -71.5979800964361

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	10/26
Client	US Army Corps Of Engineers - General
Model	YSI ProDSS
Serial Number(s)	160100431 17E101586
Sampler	Nick Burch
Date	2020-10-26
Calibration Type?	Single Point Calibration

Single Point Calibration

Expiration Date	2020-10-26
Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

08:38

Calibration Range for pH - +/- 0.2 S.U	
Time	08:38
pH Pre Calibration	3.9
pH Post Calibration	4
pH Calibration Within Range	Yes

08:39

Calibration Range for pH - +/- 0.2 S.U	
Time	08:39
pH Pre Calibration	7.12
pH Post Calibration	7
pH Calibration Within Range	Yes

08:45

Calibration Range for pH - +/- 0.2 S.U	
Time	08:45
pH Pre Calibration	9.93
pH Post Calibration	10
pH Calibration Within Range	Yes

0.951

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	08:32
Conductivity Pre Calibration	0.951
Conductivity Post Calibration	0.948

Conductivity Calibration Within Range	Yes

246.8

Calibration Range for ORP- +/- 25mV	
Time	09:03
ORP Pre Calibration	246.8
ORP Post Calibration	243.4
ORP Calibration Within Range	Yes

100.5

Calibration Range for DO- Atmospheric	
Time	08:26
DO Pre Calibration	100.5
DO Post Calibration	100.5
DO Calibration Within Range	Yes
Notes	Turbidity meter is not working using LaMotte

Signed

Signed 2020-10-26 12:50:53 UTC

Date	2020-10-26

10/29

Created	2020-10-29 12:48:31 UTC by Nicholas Burch
Updated	2020-10-29 13:38:03 UTC by Nicholas Burch
Location	42.5482865381474, -71.6024960386338

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	10/29
Client	US Army Corps Of Engineers - General
Serial Number(s)	160100431 17E101586
Sampler	Nick Burch
Date	2020-10-29
Calibration Type?	Single Point Calibration

Single Point Calibration

Expiration Date	2020-10-30
Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

09:28

Calibration Range for pH - +/- 0.2 S.U	
Time	09:28
pH Pre Calibration	3.94
pH Post Calibration	4
pH Calibration Within Range	Yes

09:28

Calibration Range for pH - +/- 0.2 S.U	
Time	09:28
pH Pre Calibration	7.1
pH Post Calibration	7
pH Calibration Within Range	Yes

09:31

Calibration Range for pH - +/- 0.2 S.U	
Time	09:31
pH Pre Calibration	10.06
pH Post Calibration	10
pH Calibration Within Range	Yes

0.712

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	09:16
Conductivity Pre Calibration	0.712
Conductivity Post Calibration	0.71
Conductivity Calibration Within Range	Yes

232.8

Calibration Range for ORP- +/- 25mV	
Time	09:20
ORP Pre Calibration	232.8
ORP Post Calibration	234
ORP Calibration Within Range	Yes

98.5

Calibration Range for DO- Atmospheric	
Time	08:49
DO Pre Calibration	98.5
DO Post Calibration	99
DO Calibration Within Range	Yes

1.99

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	09:13
Turbidity Pre Calibration	1.99
Turbidity Post Calibration	0
Turbidity Calibration Within Range	No

Signed

Signed 2020-10-29 12:49:13 UTC

Date	2020-10-29

Devens

Created	2020-10-29 14:53:34 UTC by Chip Pipala
Updated	2020-10-29 15:28:48 UTC by Chip Pipala
Location	42.5596008, -71.6000753

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	Devens
Serial Number(s)	15E102911, 17E101954
Sampler	Connor Rosenbaum
Date	2020-10-29
Calibration Type?	Single Point Calibration

Single Point Calibration

Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

11:00

Calibration Range for pH - +/- 0.2 S.U	
Time	11:00
pH Pre Calibration	5.75
pH Post Calibration	4
pH Calibration Within Range	Yes

11:02

Calibration Range for pH - +/- 0.2 S.U	
Time	11:02
pH Pre Calibration	7.05
pH Post Calibration	7.07

11:10

Calibration Range for pH - +/- 0.2 S.U	
Time	11:10
pH Pre Calibration	9.3
pH Post Calibration	10
pH Calibration Within Range	Yes

0.005

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	11:15
Conductivity Pre Calibration	0.005
Conductivity Post Calibration	0.004
Conductivity Calibration Within Range	Yes

319.1

Calibration Range for ORP- +/- 25mV	
Time	11:17

ORP Pre Calibration	319.1
ORP Post Calibration	249.6
ORP Calibration Within Range	Yes

12.2

Calibration Range for DO- Atmospheric	
Time	11:22
DO Pre Calibration	12.2
DO Post Calibration	12.39
DO Calibration Within Range	Yes

600

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	11:24
Turbidity Pre Calibration	600
Turbidity Post Calibration	0
Turbidity Calibration Within Range	No

Signed

Signed 2020-10-29 15:28:39 UTC

Date	2020-10-29

Devens

Created	2020-10-30 13:34:15 UTC by Chip Pipala
Updated	2020-10-30 14:28:33 UTC by Chip Pipala
Location	42.547058, -71.6034503

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	Devens
Serial Number(s)	15E102911, 17E101954
Sampler	Connor Rosenbaum
Date	2020-10-30
Calibration Type?	Single Point Calibration

Single Point Calibration

Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

09:38

Calibration Range for pH - +/- 0.2 S.U	
Time	09:38
pH Pre Calibration	2.23
pH Post Calibration	4
pH Calibration Within Range	Yes

09:48

Calibration Range for pH - +/- 0.2 S.U	
Time	09:48
pH Pre Calibration	5.79
pH Post Calibration	7
pH Calibration Within Range	Yes

10:08

Calibration Range for pH - +/- 0.2 S.U	
Time	10:08
pH Pre Calibration	9.3
pH Post Calibration	10
pH Calibration Within Range	Yes

0.003

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	10:18
Conductivity Pre Calibration	0.003
Conductivity Post Calibration	0.006
Conductivity Calibration Within Range	Yes

240.5

Calibration Range for ORP- +/- 25mV

Time	10:21
ORP Pre Calibration	240.5
ORP Post Calibration	246.2
ORP Calibration Within Range	Yes

11.65

Calibration Range for DO- Atmospheric	
Time	10:25
DO Pre Calibration	11.65
DO Post Calibration	11.67
DO Calibration Within Range	Yes

0.7

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	10:27
Turbidity Pre Calibration	0.7
Turbidity Post Calibration	0
Turbidity Calibration Within Range	Yes

Signed

Signed 2020-10-30 14:28:25 UTC

Date	2020-10-30

10/30

Created	2020-10-30 12:46:31 UTC by Nicholas Burch
Updated	2020-10-30 13:14:20 UTC by Nicholas Burch
Location	42.555240584952, -71.5979659179112

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	10/30
Client	US Army Corps Of Engineers - General
Model	YSI ProDSS
Serial Number(s)	160100431 17E101586
Sampler	Nick Burch
Date	2020-10-30
Calibration Type?	Single Point Calibration

Single Point Calibration

Expiration Date	2020-10-31
Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

09:09

Calibration Range for pH - +/- 0.2 S.U	
Time	09:09
pH Pre Calibration	3.96
pH Post Calibration	4

09:09

Calibration Range for pH - +/- 0.2 S.U	
Time	09:09
pH Pre Calibration	7.08
pH Post Calibration	7

09:11

Calibration Range for pH - +/- 0.2 S.U	
Time	09:11
pH Pre Calibration	10
pH Post Calibration	10

0.73

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	09:00
Conductivity Pre Calibration	0.73
Conductivity Post Calibration	0.725

234

Calibration Range for ORP- +/- 25mV	
Time	09:06

ORP Pre Calibration	234
ORP Post Calibration	234
ORP Calibration Within Range	Yes

100.1

Calibration Range for DO- Atmospheric	
Time	08:51
DO Pre Calibration	100.1
DO Post Calibration	99

0.44

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	08:52
Turbidity Pre Calibration	0.44
Turbidity Post Calibration	0

Signed

Signed 2020-10-30 12:50:06 UTC

Date	2020-10-30

Devens

Created	2020-11-02 12:18:57 UTC by Chip Pipala
Updated	2020-11-02 12:57:01 UTC by Chip Pipala
Location	42.547562, -71.602625

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	Devens
Serial Number(s)	15E102911, 17E101954
Sampler	Connor Rosenbaum
Date	2020-11-02
Calibration Type?	Single Point Calibration

Single Point Calibration

Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

07:23

Calibration Range for pH - +/- 0.2 S.U	
Time	07:23
pH Pre Calibration	4.04
pH Post Calibration	4
pH Calibration Within Range	Yes

07:30

Calibration Range for pH - +/- 0.2 S.U	
Time	07:30
pH Pre Calibration	7
pH Post Calibration	7
pH Calibration Within Range	Yes

07:41

Calibration Range for pH - +/- 0.2 S.U	
Time	07:41
pH Pre Calibration	9.9
pH Post Calibration	10

0.001

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	07:44
Conductivity Pre Calibration	0.001
Conductivity Post Calibration	0.002
Conductivity Calibration Within Range	Yes

62

Calibration Range for ORP- +/- 25mV	
Time	07:47

ORP Pre Calibration	62
ORP Post Calibration	255.4
ORP Calibration Within Range	Yes

15.2

Calibration Range for DO- Atmospheric	
Time	07:52
DO Pre Calibration	15.2
DO Post Calibration	14.21
DO Calibration Within Range	Yes

0.8

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	07:55
Turbidity Pre Calibration	0.8
Turbidity Post Calibration	0
Turbidity Calibration Within Range	Yes

Signed

Signed 2020-11-02 12:56:49 UTC

Date	2020-11-02

19j0103220, 30048392

Created	2020-11-02 13:52:21 UTC by Diane Champagne
Updated	2020-11-02 13:56:34 UTC by Diane Champagne
Location	42.5557730812976, -71.5956368577402
Equipment Serial Number	19j0103220
Project Number	30048392
Name of Sampler	Diane Champagne

Notes: (1) Always wait for meter to stabilize before recording any readings. (2) Report all digits displayed. Do not round before reporting measurements. (See special instructions for depth). (3) For Calibrations, record calibrated meter reading. Do not record initial meter reading before calibration.

Temperature (Quarterly) FT 1400

Date of Last Temperature Verification known?	N/A

DO DEP SOP FT 1500

Calibration, 2020-11-02, 08:53

Type	Calibration
Name	Diane Champagne
Date	2020-11-02
Time	08:53
Time Zone	Eastern
Temperature (degrees C)	8.8
Barometer (mmHg)	742.5
Meter DO (mg/L)	9.37
Percent DO	98.7
Probe Charge	N/A
Probe Gain	N/A
Pass/Fail	Pass
Lab/Field	Field

DO Acceptance criteria from Table ± 0.3 mg/L. Rapid-Pulse Sensors: DO Gain Range 0.7 to 1.4; DO Charge Range 25-75. Optical: DO gain range 0.85 to 1.15 (Pro DSS 0.75 to 1.50); DO charge N/A. Steady-state & Galvanic Sensors: DO Gain & Charge N/A.

Specific Conductivity FT 1200

Calibration, 2020-11-02, 08:44

Make sure to bracket your readings (i.e. Calibration (1000 uS/cm), ICV (10,000 uS/cm), ICV (100 uS/cm)

Type	Calibration
Name	Diane Champagne
Date	2020-11-02
Time	08:44
Time Zone	Eastern
Units	µS/cm
Standard Value	1.413
Meter Reading	1.414
Pass/Fail	Pass
Lab/Field	Field
Percent difference	0.07

Conductivity Acceptance	Within 5%
Conductivity Acceptance criteria ± 5%	

pH DEP SOP FT 1100

Name	Diane Champagne
Date	2020-11-02
Time	08:20
Time Zone	Eastern
pH Buffer SU	7
Meter Reading (SU)	7.02
pH Difference	0.02
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Calibration

Type	Calibration
Name	Diane Champagne
Date	2020-11-02
Time	08:14
Time Zone	Eastern
pH Buffer SU	4
Meter Reading (SU)	4
pH Difference	0
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Calibration

Type	Calibration
Name	Diane Champagne
Date	2020-11-02
Time	08:13
Time Zone	Eastern
pH Buffer SU	10
Meter Reading (SU)	9.89
pH Difference	0.11
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Depth Sensor (Daily Calibration & ICV)

Depth Calibration

Report two decimal places. Round numbers ≤ 4 down, ≥ 5 up. ICV acceptance criteria ± 5 % or ± 0.05m, whichever is greater.

Do you need to calibrate other standards?	Yes

Other Calibrations

ORP

Desired Measurement	ORP
Units	Mv
Name	Diane Champagne
Date	2020-11-02
Time	08:09
Time Zone	Eastern
Solution Concentration	240
Meter Reading	244.3

11/2

Created	2020-11-02 13:13:41 UTC by Nicholas Burch
Updated	2020-11-02 13:53:19 UTC by Nicholas Burch
Location	42.5546285397734, -71.5986983588441

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	11/2
Client	US Army Corps Of Engineers - General
Model	YSI ProDSS
Serial Number(s)	160100431 17E101586
Sampler	Nick Burch
Date	2020-11-02
Calibration Type?	Single Point Calibration

Single Point Calibration

Expiration Date	2020-11-03
Calibrated Parameters	Turbidity, DO, ORP, Conductivity, pH

08:42

Calibration Range for pH - +/- 0.2 S.U	
Time	08:42
pH Pre Calibration	3.93
pH Post Calibration	4

08:42

Calibration Range for pH - +/- 0.2 S.U	
Time	08:42
pH Pre Calibration	7.01
pH Post Calibration	7

08:45

Calibration Range for pH - +/- 0.2 S.U	
Time	08:45
pH Pre Calibration	9.92
pH Post Calibration	10

0.333

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	08:34
Conductivity Pre Calibration	0.333
Conductivity Post Calibration	0.327

224.5

Calibration Range for ORP- +/- 25mV	
Time	08:37

ORP Pre Calibration	224.5
ORP Post Calibration	234

98.5

Calibration Range for DO- Atmospheric	
Time	08:25
DO Pre Calibration	98.5
DO Post Calibration	97.6

0.2

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	08:31
Turbidity Pre Calibration	0.2
Turbidity Post Calibration	0

Signed

Signed 2020-11-02 13:14:24 UTC

Date	2020-11-02

11/4

Created	2020-11-06 12:34:52 UTC by Nicholas Burch
Updated	2020-11-06 12:37:14 UTC by Nicholas Burch
Location	42.5523078568475, -71.5924788438282

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	11/4
Client	US Army Corps Of Engineers - General
Model	YSI ProDSS
Serial Number(s)	160100431 17E101586
Sampler	Nick Burch
Date	2020-11-03
Calibration Type?	Single Point Calibration

Single Point Calibration

Expiration Date	2020-11-05
Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

08:51

Calibration Range for pH - +/- 0.2 S.U	
Time	08:51
pH Pre Calibration	4.01
pH Post Calibration	4

08:51

Calibration Range for pH - +/- 0.2 S.U	
Time	08:51
pH Pre Calibration	7.04
pH Post Calibration	7

08:54

Calibration Range for pH - +/- 0.2 S.U	
Time	08:54
pH Pre Calibration	9.97
pH Post Calibration	10

0.648

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	08:33
Conductivity Pre Calibration	0.648
Conductivity Post Calibration	0.65

248

Calibration Range for ORP- +/- 25mV	
Time	08:49

ORP Pre Calibration	248
ORP Post Calibration	234

98.8

Calibration Range for DO- Atmospheric	
Time	08:26
DO Pre Calibration	98.8
DO Post Calibration	100

3.88

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	08:32
Turbidity Pre Calibration	3.88
Turbidity Post Calibration	0

Signed

Signed 2020-11-06 12:37:07 UTC

Date	2020-11-04

19j0103220, Devens, 30048392

Created	2020-11-03 20:49:07 UTC by Diane Champagne
Updated	2020-11-05 13:53:44 UTC by Diane Champagne
Location	42.5482901791507, -71.6022352595549
Equipment Serial Number	19j0103220
Client	Devens
Project	Devens
Project Number	30048392
Name of Sampler	Diane Champagne

Notes: (1) Always wait for meter to stabilize before recording any readings. (2) Report all digits displayed. Do not round before reporting measurements. (See special instructions for depth). (3) For Calibrations, record calibrated meter reading. Do not record initial meter reading before calibration.

Temperature (Quarterly) FT 1400

Date of Last Temperature Verification known?	N/A

DO DEP SOP FT 1500

2020-11-03, 15:49

Name	Diane Champagne
Date	2020-11-03
Time	15:49
Time Zone	Eastern
Barometer (mmHg)	756.2
Percent DO	101.7
Probe Charge	N/A
Probe Gain	N/A
Pass/Fail	Pass
Lab/Field	Field

DO Acceptance criteria from Table ± 0.3 mg/L. Rapid-Pulse Sensors: DO Gain Range 0.7 to 1.4; DO Charge Range 25-75. Optical: DO gain range 0.85 to 1.15 (Pro DSS 0.75 to 1.50); DO charge N/A. Steady-state & Galvanic Sensors: DO Gain & Charge N/A.

Specific Conductivity FT 1200

2020-11-03, 16:04

Make sure to bracket your readings (i.e. Calibration (1000 uS/cm), ICV (10,000 uS/cm), ICV (100 uS/cm)

Name	Diane Champagne
Date	2020-11-03
Time	16:04
Time Zone	Eastern
Units	µmhos/cm
Standard Value	1.413
Meter Reading	1.422
Pass/Fail	Pass
Lab/Field	Field
Percent difference	0.63
Conductivity Acceptance	Within 5%

Conductivity Acceptance criteria ± 5%

pH DEP SOP FT 1100

Name	Diane Champagne
Date	2020-11-03
Time	15:50
Time Zone	Eastern
pH Buffer SU	7
Meter Reading (SU)	7.05
pH Difference	0.05
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Name	Diane Champagne
Date	2020-11-03
Time	15:51
Time Zone	Eastern
pH Buffer SU	4
Meter Reading (SU)	3.99
pH Difference	0.01
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Name	Diane Champagne
Date	2020-11-03
Time	15:52
Time Zone	Eastern
pH Buffer SU	10
Meter Reading (SU)	9.86
pH Difference	0.14
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Depth Sensor (Daily Calibration & ICV)

Depth Calibration

Report two decimal places. Round numbers ≤ 4 down, ≥ 5 up. ICV acceptance criteria ± 5 % or ± 0.05m, whichever is greater.

Devens

Created	2020-11-03 12:11:57 UTC by Chip Pipala
Updated	2020-11-03 12:47:47 UTC by Chip Pipala
Location	42.547512, -71.6026985

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	Devens
Serial Number(s)	15E102911, 17E101954
Sampler	Connor Rosenbaum
Date	2020-11-03
Calibration Type?	Single Point Calibration

Single Point Calibration

Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

07:14

Calibration Range for pH - +/- 0.2 S.U	
Time	07:14
pH Pre Calibration	4
pH Post Calibration	4
pH Calibration Within Range	Yes

07:21

Calibration Range for pH - +/- 0.2 S.U	
Time	07:21
pH Pre Calibration	6.9
pH Post Calibration	7
pH Calibration Within Range	Yes

07:33

Calibration Range for pH - +/- 0.2 S.U	
Time	07:33
pH Pre Calibration	9.98
pH Post Calibration	10.2
pH Calibration Within Range	Yes

0.004

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	07:35
Conductivity Pre Calibration	0.004
Conductivity Post Calibration	0.002
Conductivity Calibration Within Range	Yes

447.4

Calibration Range for ORP- +/- 25mV

Time	07:39
ORP Pre Calibration	447.4
ORP Post Calibration	248.6
ORP Calibration Within Range	Yes

13.44

Calibration Range for DO- Atmospheric	
Time	07:44
DO Pre Calibration	13.44
DO Post Calibration	13.33
DO Calibration Within Range	Yes

-0.8

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	07:46
Turbidity Pre Calibration	-0.8
Turbidity Post Calibration	0
Turbidity Calibration Within Range	Yes

Signed

Signed 2020-11-03 12:47:40 UTC

Date	2020-11-03

19j103220, Devens, 30048392

Created	2020-11-05 13:53:49 UTC by Diane Champagne
Updated	2020-11-05 14:05:55 UTC by Diane Champagne
Location	42.5737863360369, -71.6100620292794
Equipment Serial Number	19j103220
Client	USACE
Project	Devens
Project Number	30048392
Name of Sampler	Diane Champagne

Notes: (1) Always wait for meter to stabilize before recording any readings. (2) Report all digits displayed. Do not round before reporting measurements. (See special instructions for depth). (3) For Calibrations, record calibrated meter reading. Do not record initial meter reading before calibration.

Temperature (Quarterly) FT 1400

Date of Last Temperature Verification known?	N/A

DO DEP SOP FT 1500

2020-11-05, 08:54

Name	Diane Champagne
Date	2020-11-05
Time	08:54
Time Zone	Eastern
Temperature (degrees C)	13.4
Barometer (mmHg)	763.5
Percent DO	100.5
Probe Charge	N/A
Probe Gain	N/A
Pass/Fail	Pass
Lab/Field	Field

DO Acceptance criteria from Table ± 0.3 mg/L. Rapid-Pulse Sensors: DO Gain Range 0.7 to 1.4; DO Charge Range 25-75. Optical: DO gain range 0.85 to 1.15 (Pro DSS 0.75 to 1.50); DO charge N/A. Steady-state & Galvanic Sensors: DO Gain & Charge N/A.

Specific Conductivity FT 1200

Calibration, 2020-11-05, 09:00

Make sure to bracket your readings (i.e. Calibration (1000 uS/cm), ICV (10,000 uS/cm), ICV (100 uS/cm)

Type	Calibration
Name	Diane Champagne
Date	2020-11-05
Time	09:00
Time Zone	Eastern
Units	µS/cm
Standard Value	1.413
Pass/Fail	Fail
Lab/Field	Field
Conductivity Acceptance	Please enter values above in standard value and meter reading

Conductivity Acceptance criteria ± 5%

pH DEP SOP FT 1100

Name	Diane Champagne
Date	2020-11-05
Time	09:04
Time Zone	Eastern
pH Buffer SU	7
Meter Reading (SU)	7
pH Difference	0
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Name	Diane Champagne
Date	2020-11-05
Time	09:07
Time Zone	Eastern
pH Buffer SU	4
Meter Reading (SU)	4
pH Difference	0
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Name	Diane Champagne
Date	2020-11-05
Time	09:11
Time Zone	Eastern
pH Buffer SU	10
Meter Reading (SU)	9.89
pH Difference	0.11
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Depth Sensor (Daily Calibration & ICV)

Depth Calibration

Report two decimal places. Round numbers ≤ 4 down, ≥ 5 up. ICV acceptance criteria ± 5 % or ± 0.05m, whichever is greater.

Devens

Created	2020-11-05 14:50:22 UTC by Chip Pipala
Updated	2020-11-05 15:27:57 UTC by Chip Pipala
Location	42.5572598, -71.5959943

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	Devens
Serial Number(s)	15E102911, 17E101954
Sampler	Connor Rosenbaum
Date	2020-11-05
Calibration Type?	Single Point Calibration

Single Point Calibration

Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

09:52

Calibration Range for pH - +/- 0.2 S.U	
Time	09:52
pH Pre Calibration	4
pH Post Calibration	4
pH Calibration Within Range	Yes

09:57

Calibration Range for pH - +/- 0.2 S.U	
Time	09:57
pH Pre Calibration	7.08
pH Post Calibration	7
pH Calibration Within Range	Yes

10:08

Calibration Range for pH - +/- 0.2 S.U	
Time	10:08
pH Pre Calibration	10.15
pH Post Calibration	10.15
pH Calibration Within Range	Yes

0.001

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	10:18
Conductivity Pre Calibration	0.001
Conductivity Post Calibration	0.001
Conductivity Calibration Within Range	Yes

245.6

Calibration Range for ORP- +/- 25mV

Time	10:23
ORP Pre Calibration	245.6
ORP Post Calibration	245.9
ORP Calibration Within Range	Yes

11.02

Calibration Range for DO- Atmospheric	
Time	10:25
DO Pre Calibration	11.02
DO Post Calibration	10.99
DO Calibration Within Range	Yes

0

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	10:27
Turbidity Pre Calibration	0
Turbidity Post Calibration	0
Turbidity Calibration Within Range	Yes

Signed

Signed 2020-11-05 15:27:48 UTC

Date	2020-11-05

11/5

Created	2020-11-06 12:37:22 UTC by Nicholas Burch
Updated	2020-11-06 13:18:13 UTC by Nicholas Burch
Location	42.5483131937117, -71.6024052865347

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	11/5
Client	US Army Corps Of Engineers - General
Model	YSI ProDSS
Serial Number(s)	160100431 17E101586
Sampler	Nick Burch
Date	2020-11-06
Calibration Type?	Single Point Calibration

Single Point Calibration

Expiration Date	2020-11-07
Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

07:57

Calibration Range for pH - +/- 0.2 S.U	
Time	07:57
pH Pre Calibration	4.03
pH Post Calibration	4

07:58

Calibration Range for pH - +/- 0.2 S.U	
Time	07:58
pH Pre Calibration	6.97
pH Post Calibration	7

07:59

Calibration Range for pH - +/- 0.2 S.U	
Time	07:59
pH Pre Calibration	9.89
pH Post Calibration	10

0.771

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	07:45
Conductivity Pre Calibration	0.771
Conductivity Post Calibration	0.77

238

Calibration Range for ORP- +/- 25mV	
Time	07:48

ORP Pre Calibration	238
ORP Post Calibration	234

97.5

Calibration Range for DO- Atmospheric	
Time	07:38
DO Pre Calibration	97.5
DO Post Calibration	100

6.22

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	07:42
Turbidity Pre Calibration	6.22
Turbidity Post Calibration	0

Signed

Signed 2020-11-06 12:37:54 UTC

Date	2020-11-06

19j103220, Devens, 30048392

Created	2020-11-06 13:08:40 UTC by Diane Champagne
Updated	2020-11-06 13:27:08 UTC by Diane Champagne
Location	42.5569652393857, -71.5966417641114
Equipment Serial Number	19j103220
Project	Devens
Project Number	30048392
Name of Sampler	Diane Champagne

Notes: (1) Always wait for meter to stabilize before recording any readings. (2) Report all digits displayed. Do not round before reporting measurements. (See special instructions for depth). (3) For Calibrations, record calibrated meter reading. Do not record initial meter reading before calibration.

Temperature (Quarterly) FT 1400

Date of Last Temperature Verification known?	N/A

DO DEP SOP FT 1500

2020-11-06, 08:09

Name	Diane Champagne
Date	2020-11-06
Time	08:09
Time Zone	Eastern
Temperature (degrees C)	13.7
Barometer (mmHg)	761
Meter DO (mg/L)	9.95
Percent DO	95.8
Probe Charge	N/A
Probe Gain	N/A
Pass/Fail	Pass
Lab/Field	Field

DO Acceptance criteria from Table ± 0.3 mg/L. Rapid-Pulse Sensors: DO Gain Range 0.7 to 1.4; DO Charge Range 25-75. Optical: DO gain range 0.85 to 1.15 (Pro DSS 0.75 to 1.50); DO charge N/A. Steady-state & Galvanic Sensors: DO Gain & Charge N/A.

Specific Conductivity FT 1200

Calibration, 2020-11-06, 08:14

Make sure to bracket your readings (i.e. Calibration (1000 uS/cm), ICV (10,000 uS/cm), ICV (100 uS/cm)

Type	Calibration
Name	Diane Champagne
Date	2020-11-06
Time	08:14
Time Zone	Eastern
Lot Number	2002400030
Expiration Date	2021-06-06
Units	µS/cm
Standard Value	1.413
Conductivity Acceptance	Please enter values above in standard value and meter reading

Conductivity Acceptance criteria ± 5%

pH DEP SOP FT 1100

Name	Diane Champagne
Date	2020-11-06
Time	08:25
Time Zone	Eastern
pH Buffer SU	7
Meter Reading (SU)	7
pH Difference	0
pH Acceptance	Within 0.2 standard units
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Name	Diane Champagne
Date	2020-11-06
Time	08:26
Time Zone	Eastern
pH Buffer SU	4
Meter Reading (SU)	4
pH Difference	0
pH Acceptance	Within 0.2 standard units
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Name	Diane Champagne
Date	2020-11-06
Time	08:28
Time Zone	Eastern
pH Buffer SU	10
Meter Reading (SU)	9.95
pH Difference	0.05
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Depth Sensor (Daily Calibration & ICV)

Depth Calibration

Report two decimal places. Round numbers ≤ 4 down, ≥ 5 up. ICV acceptance criteria ± 5 % or ± 0.05m, whichever is greater.

Devens

Created	2020-11-06 11:58:34 UTC by Chip Pipala
Updated	2020-11-06 12:31:52 UTC by Chip Pipala
Location	42.547557, -71.6026218

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	Devens
Serial Number(s)	15E102911, 17E101954
Sampler	Connor Rosenbaum
Date	2020-11-06
Calibration Type?	Single Point Calibration

Single Point Calibration

Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

07:00

Calibration Range for pH - +/- 0.2 S.U	
Time	07:00
pH Pre Calibration	4
pH Post Calibration	4
pH Calibration Within Range	Yes

07:04

Calibration Range for pH - +/- 0.2 S.U	
Time	07:04
pH Pre Calibration	7
pH Post Calibration	7
pH Calibration Within Range	Yes

07:11

Calibration Range for pH - +/- 0.2 S.U	
Time	07:11
pH Pre Calibration	10.15
pH Post Calibration	10.15
pH Calibration Within Range	Yes

0.001

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	07:17
Conductivity Pre Calibration	0.001
Conductivity Post Calibration	0.001
Conductivity Calibration Within Range	Yes

246

Calibration Range for ORP- +/- 25mV

Time	07:21
ORP Pre Calibration	246
ORP Post Calibration	246.9
ORP Calibration Within Range	Yes

11.35

Calibration Range for DO- Atmospheric	
Time	07:27
DO Pre Calibration	11.35
DO Post Calibration	10.86
DO Calibration Within Range	Yes

0.1

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	07:30
Turbidity Pre Calibration	0.1
Turbidity Post Calibration	0
Turbidity Calibration Within Range	Yes

Signed

Signed 2020-11-06 12:31:43 UTC

Date	2020-11-06

Created	2020-11-09 12:49:52 UTC by Chip Pipala
Updated	2020-11-09 13:20:37 UTC by Chip Pipala
Location	42.54834910393, -71.6023694538247

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Sampler	Connor Rosenbaum
Date	2020-11-09
Calibration Type?	Single Point Calibration

Single Point Calibration

Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

07:53

Calibration Range for pH - +/- 0.2 S.U	
Time	07:53
pH Pre Calibration	4
pH Post Calibration	4
pH Calibration Within Range	Yes

07:59

Calibration Range for pH - +/- 0.2 S.U	
Time	07:59
pH Pre Calibration	7
pH Post Calibration	7.06
pH Calibration Within Range	Yes

08:06

Calibration Range for pH - +/- 0.2 S.U	
Time	08:06
pH Pre Calibration	10.12
pH Post Calibration	10.12
pH Calibration Within Range	Yes

0.001

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	08:12
Conductivity Pre Calibration	0.001
Conductivity Post Calibration	0.001
Conductivity Calibration Within Range	Yes

245

Calibration Range for ORP- +/- 25mV	
Time	08:15
ORP Pre Calibration	245
ORP Post Calibration	245.7

10.1

Calibration Range for DO- Atmospheric	
Time	08:18
DO Pre Calibration	10.1
DO Post Calibration	10.05
DO Calibration Within Range	Yes

0.5

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	08:19
Turbidity Pre Calibration	0.5
Turbidity Post Calibration	0
Turbidity Calibration Within Range	Yes

Signed

Signed 2020-11-09 13:19:50 UTC

Date	2020-11-09

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30060681
MODEL	["YSI ProDSS"]
SERIAL NUMBER	16C100431
SAMPLER	Desmond Bedard
DATE	11/9/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER			
EXPIRATION DATE			
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
--	--	--	--

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.11	7.03	yes	08:29
Conductivity	1.197	1.399	yes	08:51
ORP	261.2	234.1	yes	08:22
DO	0.34	0.03	yes	--
Turbidity	5.24	0.9	yes	08:08

AUTOCALIBRATION

LOT NUMBER						
EXPIRATION DATE						
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
--	--	--	--	--	--	--

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED DATE

CHECKED BY DATE

Created	2020-11-10 13:00:10 UTC by Chip Pipala
Updated	2020-11-10 13:30:54 UTC by Chip Pipala
Location	42.5483615091467, -71.6024065856557

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Sampler	Connor Rosenbaum
Date	2020-11-10
Calibration Type?	Single Point Calibration

Single Point Calibration

Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

08:04

Calibration Range for pH - +/- 0.2 S.U	
Time	08:04
pH Pre Calibration	3.96
pH Post Calibration	4
pH Calibration Within Range	Yes

08:06

Calibration Range for pH - +/- 0.2 S.U	
Time	08:06
pH Pre Calibration	7.03
pH Post Calibration	7.03
pH Calibration Within Range	Yes

08:14

Calibration Range for pH - +/- 0.2 S.U	
Time	08:14
pH Pre Calibration	10.14
pH Post Calibration	10.07
pH Calibration Within Range	Yes

0.001

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	08:19
Conductivity Pre Calibration	0.001
Conductivity Post Calibration	0.001
Conductivity Calibration Within Range	Yes

237.5

Calibration Range for ORP- +/- 25mV	
Time	08:21
ORP Pre Calibration	237.5
ORP Post Calibration	241.5

ORP Calibration Within Range	Yes

9.95

Calibration Range for DO- Atmospheric	
Time	08:26
DO Pre Calibration	9.95
DO Post Calibration	8.95
DO Calibration Within Range	Yes

1

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	08:27
Turbidity Pre Calibration	1
Turbidity Post Calibration	0
Turbidity Calibration Within Range	Yes

Signed

Signed 2020-11-10 13:30:08 UTC

Date	2020-11-10

19j103220, Devens, 30048392

Created	2020-11-10 14:34:01 UTC by Diane Champagne
Updated	2020-11-10 14:38:22 UTC by Diane Champagne
Location	42.5552646350512, -71.5980981197875
Equipment Serial Number	19j103220
Client	USACE
Project	Devens
Project Number	30048392
Name of Sampler	Diane Champagne

Notes: (1) Always wait for meter to stabilize before recording any readings. (2) Report all digits displayed. Do not round before reporting measurements. (See special instructions for depth). (3) For Calibrations, record calibrated meter reading. Do not record initial meter reading before calibration.

Temperature (Quarterly) FT 1400

Date of Last Temperature Verification known?	N/A

DO DEP SOP FT 1500

2020-11-10, 09:35

Name	Diane Champagne
Date	2020-11-10
Time	09:35
Time Zone	Eastern
Barometer (mmHg)	758.3
Meter DO (mg/L)	9.86
Percent DO	99.8
Probe Charge	N/A
Probe Gain	N/A
Pass/Fail	Pass
Lab/Field	Field

DO Acceptance criteria from Table ± 0.3 mg/L. Rapid-Pulse Sensors: DO Gain Range 0.7 to 1.4; DO Charge Range 25-75. Optical: DO gain range 0.85 to 1.15 (Pro DSS 0.75 to 1.50); DO charge N/A. Steady-state & Galvanic Sensors: DO Gain & Charge N/A.

Specific Conductivity FT 1200

2020-11-10, 09:38

Make sure to bracket your readings (i.e. Calibration (1000 uS/cm), ICV (10,000 uS/cm), ICV (100 uS/cm)

Name	Diane Champagne
Date	2020-11-10
Time	09:38
Time Zone	Eastern
Units	µS/cm
Standard Value	1.413
Meter Reading	1.415
Pass/Fail	Pass
Lab/Field	Field
Percent difference	0.14
Conductivity Acceptance	Within 5%

Conductivity Acceptance criteria ± 5%

pH DEP SOP FT 1100

Name	Diane Champagne
Date	2020-11-10
Time	09:41
Time Zone	Eastern
pH Buffer SU	7
Meter Reading (SU)	7.02
pH Difference	0.02
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Name	Diane Champagne
Date	2020-11-10
Time	09:44
Time Zone	Eastern
pH Buffer SU	4
Meter Reading (SU)	4
pH Difference	0
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Name	Diane Champagne
Date	2020-11-10
Time	09:48
Time Zone	Eastern
pH Buffer SU	10
Meter Reading (SU)	9.99
pH Difference	0.01
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Depth Sensor (Daily Calibration & ICV)

Depth Calibration

Report two decimal places. Round numbers ≤ 4 down, ≥ 5 up. ICV acceptance criteria ± 5 % or ± 0.05m, whichever is greater.

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30060681
MODEL	
SERIAL NUMBER	16C100431
SAMPLER	Desmond Bedard
DATE	11/10/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER			
EXPIRATION DATE			
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
--	--	--	--

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	6.89	7.01	yes	08:43
Conductivity	2.043	1.412	yes	--
ORP	216.1	229.4	yes	08:16
DO	0.18	0.07	yes	08:49
Turbidity	2.45	0.11	yes	08:30

AUTOCALIBRATION

LOT NUMBER						
EXPIRATION DATE						
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
--	--	--	--	--	--	--

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

	11/10/2020		
SIGNED	DATE	CHECKED BY	DATE

Fort Devens

Created	2020-11-11 12:02:15 UTC by Chip Pipala
Updated	2020-11-11 12:33:19 UTC by Chip Pipala
Location	42.548358282114, -71.6025375109833

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	Fort Devens
Sampler	Connor Rosenbaum
Date	2020-11-11
Calibration Type?	Single Point Calibration

Single Point Calibration

Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

07:03

Calibration Range for pH - +/- 0.2 S.U	
Time	07:03
pH Pre Calibration	4.07
pH Post Calibration	4
pH Calibration Within Range	Yes

07:10

Calibration Range for pH - +/- 0.2 S.U	
Time	07:10
pH Pre Calibration	7
pH Post Calibration	7.05
pH Calibration Within Range	Yes

07:18

Calibration Range for pH - +/- 0.2 S.U	
Time	07:18
pH Pre Calibration	10.13
pH Post Calibration	10.13
pH Calibration Within Range	Yes

0.001

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	07:24
Conductivity Pre Calibration	0.001
Conductivity Post Calibration	0.001
Conductivity Calibration Within Range	Yes

242.7

Calibration Range for ORP- +/- 25mV	
Time	07:27

ORP Pre Calibration	242.7
ORP Post Calibration	242.7
ORP Calibration Within Range	Yes

8.67

Calibration Range for DO- Atmospheric	
Time	19:30
DO Pre Calibration	8.67
DO Post Calibration	8.54
DO Calibration Within Range	Yes

-0.1

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	07:32
Turbidity Pre Calibration	-0.1
Turbidity Post Calibration	0
Turbidity Calibration Within Range	Yes

Signed

Signed 2020-11-11 12:33:13 UTC

Date	2020-11-11

19jj103220, Devens, 30048392

Created	2020-11-11 12:42:12 UTC by Diane Champagne
Updated	2020-11-11 13:07:58 UTC by Diane Champagne
Location	42.548285652923, -71.6024595592838
Equipment Serial Number	19jj103220
Client	USACE
Project	Devens
Project Number	30048392
Name of Sampler	Diane Champagne

Notes: (1) Always wait for meter to stabilize before recording any readings. (2) Report all digits displayed. Do not round before reporting measurements. (See special instructions for depth). (3) For Calibrations, record calibrated meter reading. Do not record initial meter reading before calibration.

Temperature (Quarterly) FT 1400

Date of Last Temperature Verification known?	N/A

DO DEP SOP FT 1500

2020-11-11, 07:46

Name	Diane Champagne
Date	2020-11-11
Time	07:46
Time Zone	Eastern
Temperature (degrees C)	17.4
Barometer (mmHg)	754.8
Percent DO	99.4
Probe Charge	N/A
Probe Gain	N/A
Pass/Fail	Pass
Lab/Field	Field

DO Acceptance criteria from Table ± 0.3 mg/L. Rapid-Pulse Sensors: DO Gain Range 0.7 to 1.4; DO Charge Range 25-75. Optical: DO gain range 0.85 to 1.15 (Pro DSS 0.75 to 1.50); DO charge N/A. Steady-state & Galvanic Sensors: DO Gain & Charge N/A.

Specific Conductivity FT 1200

2020-11-11, 07:47

Make sure to bracket your readings (i.e. Calibration (1000 uS/cm), ICV (10,000 uS/cm), ICV (100 uS/cm)

Name	Diane Champagne
Date	2020-11-11
Time	07:47
Time Zone	Eastern
Units	µS/cm
Standard Value	1.413
Meter Reading	1.522
Pass/Fail	Pass
Lab/Field	Field
Percent difference	7.43
Conductivity Acceptance	Out of range

Conductivity Acceptance criteria ± 5%

pH DEP SOP FT 1100

Name	Diane Champagne
Date	2020-11-11
Time	07:56
Time Zone	Eastern
Expiration Date	2020-11-11
pH Buffer SU	7
Meter Reading (SU)	7.04
pH Difference	0.04
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Name	Diane Champagne
Date	2020-11-11
Time	07:56
Time Zone	Eastern
pH Buffer SU	4
Meter Reading (SU)	4.01
pH Difference	0.01
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Name	Diane Champagne
Date	2020-11-11
Time	08:03
Time Zone	Eastern
pH Buffer SU	10
Meter Reading (SU)	10
pH Difference	0
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Depth Sensor (Daily Calibration & ICV)

Depth Calibration

Report two decimal places. Round numbers ≤ 4 down, ≥ 5 up. ICV acceptance criteria ± 5 % or ± 0.05m, whichever is greater.

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["YSI ProDSS"]
SERIAL NUMBER	16C100431
SAMPLER	Desmond Bedard
DATE	11/11/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER			
EXPIRATION DATE			
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
--	--	--	--

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	6.95	6.99	yes	08:16
Conductivity	1.498	1.414	yes	08:26
ORP	211.2	234.7	yes	08:50
DO	0.09	0	yes	08:30
Turbidity	1.76	0.32	yes	09:01

AUTOCALIBRATION

LOT NUMBER						
EXPIRATION DATE						
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
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[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

	11/11/2020		
SIGNED	DATE	CHECKED BY	DATE

Fort Devens

Created	2020-11-12 12:04:48 UTC by Chip Pipala
Updated	2020-11-12 12:37:36 UTC by Chip Pipala
Location	42.5483403448412, -71.6024546139609

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	Fort Devens
Sampler	Connor Rosenbaum
Date	2020-11-12
Calibration Type?	Single Point Calibration

Single Point Calibration

Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

07:05

Calibration Range for pH - +/- 0.2 S.U	
Time	07:05
pH Pre Calibration	4.64
pH Post Calibration	4
pH Calibration Within Range	Yes

07:16

Calibration Range for pH - +/- 0.2 S.U	
Time	07:16
pH Pre Calibration	7.03
pH Post Calibration	7.03
pH Calibration Within Range	Yes

07:21

Calibration Range for pH - +/- 0.2 S.U	
Time	07:21
pH Pre Calibration	10.08
pH Post Calibration	10.08
pH Calibration Within Range	Yes

0

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	07:28
Conductivity Pre Calibration	0
Conductivity Post Calibration	0
Conductivity Calibration Within Range	Yes

237.5

Calibration Range for ORP- +/- 25mV	
Time	07:31

ORP Pre Calibration	237.5
ORP Post Calibration	240.3
ORP Calibration Within Range	Yes

8.61

Calibration Range for DO- Atmospheric	
Time	07:34
DO Pre Calibration	8.61
DO Post Calibration	8.23
DO Calibration Within Range	Yes

-0.1

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	07:37
Turbidity Pre Calibration	-0.1
Turbidity Post Calibration	0
Turbidity Calibration Within Range	Yes

Signed

Signed 2020-11-12 12:37:29 UTC

Date	2020-11-12

19j103220, Devens, 30048392

Created	2020-11-12 12:50:55 UTC by Diane Champagne
Updated	2020-11-12 13:21:39 UTC by Diane Champagne
Location	42.5483651552746, -71.6024077591222
Equipment Serial Number	19j103220
Client	USACE
Project	Devens
Project Number	30048392
Name of Sampler	Diane Champagne

Notes: (1) Always wait for meter to stabilize before recording any readings. (2) Report all digits displayed. Do not round before reporting measurements. (See special instructions for depth). (3) For Calibrations, record calibrated meter reading. Do not record initial meter reading before calibration.

Temperature (Quarterly) FT 1400

Date of Last Temperature Verification known?	N/A

DO DEP SOP FT 1500

2020-11-12, 07:47

Name	Diane Champagne
Date	2020-11-12
Time	07:47
Time Zone	Eastern
Temperature (degrees C)	18
Barometer (mmHg)	752.6
Percent DO	98.2
Probe Charge	N/A
Probe Gain	N/A
Pass/Fail	Pass
Lab/Field	Field

DO Acceptance criteria from Table ± 0.3 mg/L. Rapid-Pulse Sensors: DO Gain Range 0.7 to 1.4; DO Charge Range 25-75. Optical: DO gain range 0.85 to 1.15 (Pro DSS 0.75 to 1.50); DO charge N/A. Steady-state & Galvanic Sensors: DO Gain & Charge N/A.

Specific Conductivity FT 1200

2020-11-12, 08:05

Make sure to bracket your readings (i.e. Calibration (1000 uS/cm), ICV (10,000 uS/cm), ICV (100 uS/cm)

Name	Diane Champagne
Date	2020-11-12
Time	08:05
Time Zone	Eastern
Units	µS/cm
Standard Value	1.413
Meter Reading	1.389
Pass/Fail	Pass
Lab/Field	Field
Percent difference	1.71
Conductivity Acceptance	Within 5%

Conductivity Acceptance criteria ± 5%

pH DEP SOP FT 1100

Name	Diane Champagne
Date	2020-11-12
Time	08:10
Time Zone	Eastern
pH Buffer SU	7
Meter Reading (SU)	7.03
pH Difference	0.03
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Name	Diane Champagne
Date	2020-11-12
Time	08:10
Time Zone	Eastern
pH Buffer SU	4
Meter Reading (SU)	4
pH Difference	0
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Name	Diane Champagne
Date	2020-11-12
Time	08:17
Time Zone	Eastern
pH Buffer SU	10
Meter Reading (SU)	10.09
pH Difference	0.09
pH Acceptance	Within 0.2 standard units
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Depth Sensor (Daily Calibration & ICV)

Depth Calibration

Report two decimal places. Round numbers ≤ 4 down, ≥ 5 up. ICV acceptance criteria ± 5 % or ± 0.05m, whichever is greater.

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["YSI ProDSS"]
SERIAL NUMBER	16C100431
SAMPLER	Desmond Bedard
DATE	11/12/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER			
EXPIRATION DATE			
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
--	--	--	--

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	6.95	6.99	yes	08:03
Conductivity	1.442	1.413	yes	08:15
ORP	237.4	233.9	yes	--
DO	0.16	0	yes	08:41
Turbidity	0.18	0.05	yes	08:25

AUTOCALIBRATION

LOT NUMBER						
EXPIRATION DATE						
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
--	--	--	--	--	--	--

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

	11/12/2020		
SIGNED	DATE	CHECKED BY	DATE

Fort Devens

Created	2020-11-13 12:05:07 UTC by Chip Pipala
Updated	2020-11-13 12:46:40 UTC by Chip Pipala
Location	42.5482828030759, -71.602417901225

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	Fort Devens
Sampler	Connor Rosenbaum
Date	2020-11-13
Calibration Type?	Single Point Calibration

Single Point Calibration

Calibrated Parameters	pH, Conductivity, ORP, DO, Turbidity

07:05

Calibration Range for pH - +/- 0.2 S.U	
Time	07:05
pH Pre Calibration	4
pH Post Calibration	4
pH Calibration Within Range	Yes

07:25

Calibration Range for pH - +/- 0.2 S.U	
Time	07:25
pH Pre Calibration	6.84
pH Post Calibration	7.08
pH Calibration Within Range	Yes

07:27

Calibration Range for pH - +/- 0.2 S.U	
Time	07:27
pH Pre Calibration	10.2
pH Post Calibration	10.21
pH Calibration Within Range	Yes

0.005

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	07:39
Conductivity Pre Calibration	0.005
Conductivity Post Calibration	0.004
Conductivity Calibration Within Range	Yes

255.5

Calibration Range for ORP- +/- 25mV	
Time	07:41

ORP Pre Calibration	255.5
ORP Post Calibration	251.9
ORP Calibration Within Range	Yes

9.91

Calibration Range for DO- Atmospheric	
Time	07:44
DO Pre Calibration	9.91
DO Post Calibration	9.57
DO Calibration Within Range	Yes

0.4

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Time	07:46
Turbidity Pre Calibration	0.4
Turbidity Post Calibration	0
Turbidity Calibration Within Range	Yes

Signed

Signed 2020-11-13 12:46:35 UTC

Date	2020-11-13

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["YSI 556 MPS"]
SERIAL NUMBER	14F100062
SAMPLER	Desmond Bedard
DATE	5/15/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER			
EXPIRATION DATE			
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
--	--	--	--

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME

AUTOCALIBRATION

LOT NUMBER	OGD136 - conductivity (apr/21); 0GB276 - pH (feb/22)					
EXPIRATION DATE	04/30/2021					
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
PH	7.05	7.01		09:24	PH	yes
CONDUCTIVITY	0.89	1.001		09:24	CONDUCTIVITY	yes

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

5/15/2020

DATE

CHECKED BY

DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["Geotech portable turbidity meter"]
SERIAL NUMBER	19011937
SAMPLER	Desmond Bedard
DATE	5/15/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER	Lt 231D		
EXPIRATION DATE	09/15/2020		
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
0.12	0.02	yes	09:16

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME

AUTOCALIBRATION

LOT NUMBER						
EXPIRATION DATE						
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
--	--	--	--	--	--	--

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

5/15/2020

DATE

CHECKED BY

DATE

Devens

Created	2020-05-18 20:32:14 UTC by Diane Champagne
Updated	2020-05-18 20:35:16 UTC by Brian Webb
Location	42.5543686934212, -71.5952932835292

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	Devens
Project Number	30048392
Model	Ysi
Model	Ysi
Serial Number(s)	02f0329ab
Sampler	Diane champagne
Date	2020-05-18
Calibration Type?	Auto and Turbidity Calibration
Calibration Type?	Both

Turbidity Calibration

08:00, 12.2, 9.99, yes

Pre Calibration	12.2
Post Calibration	9.99
Calibration Within Range	Yes
Time	08:00

Auto Calibration

08:02

Please select all parameters you wish to calibrate together and enter them together at the same time in the form.

Time	08:02
Calibrated Parameters	pH, Conductivity, DO

Calibration Ranges are specific to the model of the water quality meter

pH

Calibration Range for pH - +/- 0.2 S.U

pH Pre Calibration	7.19
pH Post Calibration	7
pH Calibration Within Range	Yes

Conductivity

Calibration Range for Conductivity - +/- 1% of the calibration standard

Conductivity Pre Calibration	1.444
Conductivity Post Calibration	1.413
Conductivity Calibration Within Range	Yes

ORP

Calibration Range for ORP- +/- 25mV	

Dissolved Oxygen

Calibration Range for DO- Atmospheric	
DO Pre Calibration	8.65
DO Post Calibration	9.99
DO Calibration Within Range	Yes

Turbidity

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Notes	Out of Palms orp cal solution. US Env Rental did not put orp cal solution in ysi pack

Signed

Signed 2020-05-18 20:34:17 UTC

Fort Devens

Created	2020-05-18 11:43:05 UTC by Gabriel O'Connor
Updated	2020-05-18 11:56:57 UTC by Ryan Miller
Location	42.4407917838427, -71.2989146286139

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	Fort Devens
Client	Other
Model	YSI 650 MDS
Model	YSI 650 MDS
Serial Number(s)	01M0616AB
Sampler	Gabriel O'Connor
Date	2020-05-18
Calibration Type?	Auto and Turbidity Calibration
Calibration Type?	Both

Auto Calibration

Expiration Date	2022-02-01

07:45

Please select all parameters you wish to calibrate together and enter them together at the same time in the form.

Time	07:45
Calibrated Parameters	pH, Conductivity, Turbidity, DO

Calibration Ranges are specific to the model of the water quality meter

pH

Calibration Range for pH - +/- 0.2 S.U

pH Pre Calibration	3.97
pH Post Calibration	4
pH Calibration Within Range	Yes

Conductivity

Calibration Range for Conductivity - +/- 1% of the calibration standard

Conductivity Pre Calibration	928
Conductivity Post Calibration	997
Conductivity Calibration Within Range	Yes

ORP

Calibration Range for ORP- +/- 25mV

Dissolved Oxygen

Calibration Range for DO- Atmospheric

DO Pre Calibration	110
DO Post Calibration	103
DO Calibration Within Range	No

Turbidity

Calibration Range for Turbidity - +/- 5% of the calibration standard	
Turbidity Pre Calibration	19.96
Turbidity Post Calibration	19.99
Turbidity Calibration Within Range	Yes
Signed	

Signed 2020-05-18 11:56:48 UTC

Date	2020-05-18

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["YSI 556 MPS"]
SERIAL NUMBER	14F100062
SAMPLER	Desmond Bedard
DATE	5/18/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER			
EXPIRATION DATE			
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
--	--	--	--

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME

AUTOCALIBRATION

LOT NUMBER	0GB276 - pH - Feb 22; 0GD136 - conductivity- Apr 21					
EXPIRATION DATE	04/30/2021					
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
PH	7.23	7.02		15:16	PH	yes
CONDUCTIVITY	990	1001		15:16	CONDUCTIVITY	yes

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

5/18/2020

DATE

CHECKED BY

DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["Geotech portable turbidity meter"]
SERIAL NUMBER	19011937
SAMPLER	Desmond Bedard
DATE	5/18/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER	231D		
EXPIRATION DATE	09/30/2020		
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
0.22	0.03	yes	--

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME

AUTOCALIBRATION

LOT NUMBER						
EXPIRATION DATE						
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
--	--	--	--	--	--	--

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["Ysi"]
SERIAL NUMBER	02f0329ab
SAMPLER	Diane champagne
DATE	5/18/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER			
EXPIRATION DATE			
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
12.2	9.99	yes	08:00

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME

AUTOCALIBRATION

LOT NUMBER						
EXPIRATION DATE						
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
--	--	--	--	--	--	--
PH	7.19	7		08:02	PH	yes
CONDUCTIVITY	1.444	1.413		08:02	CONDUCTIVITY	yes
DO	8.65	9.99		08:02	DO	yes

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

Out of Palms orp cal solution. US Env Rental did not put orp cal solution in ysi pack

SIGNED	DATE	CHECKED BY	DATE

Devens

Created	2020-05-19 20:54:34 UTC by Diane Champagne
Updated	2020-05-19 20:56:58 UTC by Brian Webb
Location	42.5429510744685, -71.4660929516623

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	Devens
Project Number	30048392
Model	Ysi
Model	Ysi
Serial Number(s)	02f0329ab
Sampler	Diane champagne
Date	2020-05-19
Calibration Type?	Auto and Turbidity Calibration
Calibration Type?	Both

Turbidity Calibration

19:54, 15.9, 9.99, yes

Pre Calibration	15.9
Post Calibration	9.99
Calibration Within Range	Yes
Time	19:54

Auto Calibration

07:55

Please select all parameters you wish to calibrate together and enter them together at the same time in the form.

Time	07:55
Calibrated Parameters	pH, Conductivity, DO

Calibration Ranges are specific to the model of the water quality meter

pH

Calibration Range for pH - +/- 0.2 S.U

pH Pre Calibration	7.84
pH Post Calibration	7
pH Calibration Within Range	Yes

Conductivity

Calibration Range for Conductivity - +/- 1% of the calibration standard

Conductivity Pre Calibration	1.449
Conductivity Post Calibration	1.413
Conductivity Calibration Within Range	Yes

ORP

Calibration Range for ORP- +/- 25mV

Dissolved Oxygen

Calibration Range for DO- Atmospheric	
DO Pre Calibration	12.77
DO Post Calibration	10.12
DO Calibration Within Range	Yes

Turbidity

Calibration Range for Turbidity - +/- 5% of the calibration standard

Signed

Signed 2020-05-19 20:55:43 UTC

Date	2020-05-19

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["Geotech portable turbidity meter"]
SERIAL NUMBER	19011937
SAMPLER	Desmond Bedard
DATE	5/19/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER			
EXPIRATION DATE			
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
--	--	--	--

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME

AUTOCALIBRATION

LOT NUMBER	OGB276 - pH -feb 22; OGD136 - conductivity - apr 21					
EXPIRATION DATE	04/30/2021					
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
PH	6.89	7.01		07:40	PH	yes
CONDUCTIVITY	971	999		07:40	CONDUCTIVITY	yes

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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5/19/2020

DATE

CHECKED BY

DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["Geotech portable turbidity meter"]
SERIAL NUMBER	19011937
SAMPLER	Desmond Bedard
DATE	5/19/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER	231D		
EXPIRATION DATE	09/30/2020		
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
0.11	0.04	yes	07:54

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME

AUTOCALIBRATION

LOT NUMBER						
EXPIRATION DATE						
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
--	--	--	--	--	--	--

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

5/19/2020

DATE

CHECKED BY

DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["Ysi"]
SERIAL NUMBER	02f0329ab
SAMPLER	Diane champagne
DATE	5/19/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER			
EXPIRATION DATE			
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
15.9	9.99	yes	19:54

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME

AUTOCALIBRATION

LOT NUMBER						
EXPIRATION DATE						
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
--	--	--	--	--	--	--
PH	7.84	7		07:55	PH	yes
CONDUCTIVITY	1.449	1.413		07:55	CONDUCTIVITY	yes
DO	12.77	10.12		07:55	DO	yes

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

5/19/2020

SIGNED	DATE	CHECKED BY	DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["YSI 556 MPS"]
SERIAL NUMBER	14F100062
SAMPLER	Desmond Bedard
DATE	5/20/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER			
EXPIRATION DATE			
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
--	--	--	--

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME

AUTOCALIBRATION

LOT NUMBER	OGB273					
EXPIRATION DATE	02/28/2022					
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
PH	9.85	10.01		08:11	PH	

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

Out of conductivity standard

	5/20/2020		
SIGNED	DATE	CHECKED BY	DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["Geotech portable turbidity meter"]
SERIAL NUMBER	19011937
SAMPLER	Desmond Bedard
DATE	5/20/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER	231D		
EXPIRATION DATE	09/30/2020		
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
0.08	0.03	yes	08:00

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME

AUTOCALIBRATION

LOT NUMBER						
EXPIRATION DATE						
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
--	--	--	--	--	--	--

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

Bump test was within range (<.10 NTUs too)

SIGNED

5/20/2020

DATE

CHECKED BY

DATE

02f0329ab, 02f0329ab, Devens, 30048392

Created	2020-05-21 19:39:47 UTC by Diane Champagne
Updated	2020-05-21 19:45:17 UTC by Diane Champagne
Location	42.557813110801, -71.5979531128626
Meter ID	02f0329ab
Equipment Serial Number	02f0329ab
Client	Devens
Project	Devens
Project Number	30048392
Name of Sampler	Champagne

Notes: (1) Always wait for meter to stabilize before recording any readings. (2) Report all digits displayed. Do not round before reporting measurements. (See special instructions for depth). (3) For Calibrations, record calibrated meter reading. Do not record initial meter reading before calibration.

Temperature (Quarterly) FT 1400

Date of Last Temperature Verification known?	N/A

DO DEP SOP FT 1500

Calibration, 2020-05-21, 07:32

Type	Calibration
Name	Champagne
Date	2020-05-21
Time	07:32
Time Zone	Eastern
Temperature (degrees C)	52
Barometer (mmHg)	766.9
DO Chart (mg/L)	10.02
Meter DO (mg/L)	10.02
Percent DO	95.9
Probe Charge	N/A
Probe Gain	N/A
Pass/Fail	Pass
Lab/Field	Field

DO Acceptance criteria from Table ± 0.3 mg/L. Rapid-Pulse Sensors: DO Gain Range 0.7 to 1.4; DO Charge Range 25-75. Optical: DO gain range 0.85 to 1.15 (Pro DSS 0.75 to 1.50); DO charge N/A. Steady-state & Galvanic Sensors: DO Gain & Charge N/A.

Specific Conductivity FT 1200

Calibration, 2020-05-21, 07:42

Make sure to bracket your readings (i.e. Calibration (1000 uS/cm), ICV (10,000 uS/cm), ICV (100 uS/cm)

Type	Calibration
Name	Champagne
Date	2020-05-21
Time	07:42
Time Zone	Eastern
Units	µS/cm
Standard Value	1000

Meter Reading	999.7
Pass/Fail	Pass
Lab/Field	Field
Percent difference	0.03
Conductivity Acceptance	Within 5%
Conductivity Acceptance criteria ± 5%	

pH DEP SOP FT 1100

Calibration

Type	Calibration
Name	Champagne
Date	2020-05-21
Time	07:35
Time Zone	Eastern
pH Buffer SU	7
Meter Reading (SU)	7.01
pH Difference	0.01
pH Acceptance	Within 0.2 standard units
mV pH	42.3
mV pH Difference	42.3
mV pH Acceptance	Within 50 mV
Pass/Fail	Pass
Lab/Field	Field
pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50	

Depth Sensor (Daily Calibration & ICV)

Depth Calibration

Report two decimal places. Round numbers ≤ 4 down, ≥ 5 up. ICV acceptance criteria ± 5 % or ± 0.05m, whichever is greater.	
Do you need to calibrate other standards?	No

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["YSI 556 MPS"]
SERIAL NUMBER	14F100062
SAMPLER	Desmond Bedard
DATE	5/21/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER			
EXPIRATION DATE			
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
--	--	--	--

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME

AUTOCALIBRATION

LOT NUMBER	0GB273					
EXPIRATION DATE	02/28/2022					
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
PH	9.89	9.99		08:50	PH	

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

Only have pH standard available

SIGNED

5/21/2020

DATE

CHECKED BY

DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["Geotech portable turbidity meter"]
SERIAL NUMBER	19011937
SAMPLER	Desmond Bedard
DATE	5/21/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER	231D		
EXPIRATION DATE	09/30/2020		
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
0.11	0.04	--	09:03

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME

AUTOCALIBRATION

LOT NUMBER						
EXPIRATION DATE						
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
--	--	--	--	--	--	--

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

5/21/2020
DATE

CHECKED BY

DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["YSI 556 MPS"]
SERIAL NUMBER	14F100062
SAMPLER	Desmond Bedard
DATE	5/22/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER			
EXPIRATION DATE			
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
--	--	--	--

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME

AUTOCALIBRATION

LOT NUMBER	0GB875					
EXPIRATION DATE	05/22/2020					
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
PH	3.86	4		08:35	PH	yes

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

Only have pH standard available

SIGNED

5/22/2020

DATE

CHECKED BY

DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Devens
PROJECT NUMBER	30048392
MODEL	["Geotech portable turbidity meter"]
SERIAL NUMBER	19011937
SAMPLER	Desmond Bedard
DATE	5/22/2020

TURBIDITY CALIBRATION

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER	231D		
EXPIRATION DATE	09/30/2020		
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
0.09	0.05	yes	08:20

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME

AUTOCALIBRATION

LOT NUMBER						
EXPIRATION DATE						
CALIBRATION	CALIBRATION READINGS		AUTOCALIBRATION	TIME	CALIBRATION RANGES [1]	
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	WITHIN RANGE			
--	--	--	--	--	--	--

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

Bump test was also within acceptable range

SIGNED

5/22/2020

DATE

CHECKED BY

DATE

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	PZ-12-10			**Date**	10/26/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	39.0 degrees F and Rain and Fog/Mist. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	23.4	**Total Depth (ft-bmp)**	32	**Water Column(ft)**	8.6	**Gallons in Well**	1.4
MP Elevation		**Pump Intake (ft-bmp)**	39.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:40	**Volumes Purged**	1.77	**Sample ID**	PZ-12-10-FAL20	**Sampled by**	Diane Champagne
Purge Start	08:35	**Gallons Purged**	2.48	**Replicate/ Code No.**	PZ-12-10-FAL20 MS/MSD		
Purge End	10:24						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:45	0	0	140	23.4	0.00	7.85	0.071	2.64	4.87	9.1	137.5	Clear	None
08:50	5	5	140	23.4	0.00	7.58	0.07	2.84	4.8	9	144.5	Clear	None
08:55	5	10	140	23.4	0.00	7.41	0.07	2.54	4.76	9.1	148.5	Clear	None
09:00	5	15	140	23.4	0.00	7.22	0.07	2.3	4.71	9.2	152.9	Clear	None
09:05	5	20	140	23.41	0.00	7.18	0.07	2.39	4.66	9.2	154.1	Clear	None
09:10	5	25	140	23.41	0.00	7.1	0.07	2.59	4.69	9.2	156.6	Clear	None
09:15	5	30	140	23.41	0.00	7.02	0.07	2.61	4.6	9.1	158.6	Clear	None
09:20	5	35	140	23.41	0.00	6.96	0.07	2.51	4.42	9	160.6	Clear	None
09:25	5	40	140	23.41	0.00	6.91	0.07	2.35	4.26	9.2	162.1	Clear	None
09:30	5	45	140	23.41	0.00	6.86	0.071	2.21	4.32	9.3	163.1	Clear	None
09:35	5	50	140	23.41	0.00	6.82	0.071	2.43	4.47	9.2	164.7	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Barrier wall

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	PZ-12-09			**Date**	10/26/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	41.0 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	24.72	**Total Depth (ft-bmp)**	30	**Water Column(ft)**	5.28	**Gallons in Well**	0.86
MP Elevation		**Pump Intake (ft-bmp)**	28	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:40	**Volumes Purged**	2.93	**Sample ID**	PZ-12-09-FAL20	**Sampled by**	Diane Champagne
Purge Start	10:35	**Gallons Purged**	2.52	**Replicate/ Code No.**	PZ-12-09-FAL20-MS/MSD		
Purge End	12:39						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:05	0	0	140	24.72	0.00	6.97	0.185	68.61	2.79	9.4	154.8	Black	None
11:10	5	5	140	24.72	0.00	6.99	0.186	61.75	1.44	9.8	139.8	Black	None
11:15	5	10	140	24.72	0.00	6.93	0.184	51.73	1.49	9.8	140.2	Black	None
11:20	5	15	140	24.72	0.00	7.04	0.182	43.22	1.69	9.8	135.9	Black	None
11:25	5	20	140	24.72	0.00	7.06	0.182	39.26	1.46	9.7	128.3	Black	None
11:30	5	25	140	24.72	0.00	6.99	0.181	38.28	1.36	9.8	124.4	Black	None
11:36	6	31	140	24.71	0.00	6.99	0.182	39.64	1.39	9.8	122.3	Black	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-05-39B			**Date**	10/26/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	39.9 degrees F and Light Rain. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.5	**Total Depth (ft-bmp)**	65.85	**Water Column(ft)**	54.35	**Gallons in Well**	13.8
MP Elevation		**Pump Intake (ft-bmp)**	61.85	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:00	**Volumes Purged**	0.70	**Sample ID**	SHM-05-39B-FAL20	**Sampled by**	Nick Burch
Purge Start	10:29	**Gallons Purged**	9.64	**Replicate/ Code No.**			
Purge End	13:08						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:30	0	0	250	11.5	0.00	7.3	0.12	52.5	5	12	269	Clear	None
10:35	5	5	250	12.5	0.00	5.38	0.116	49.7	3.17	12	317	Clear	None
10:40	5	10	250	13.5	0.00	5.28	0.116	48.3	3.12	12	324.7	Clear	None
10:45	5	15	250	14.5	0.00	5.27	0.117	47.5	3.02	12.2	322.3	Clear	None
10:50	5	20	250	15.6	0.00	5.31	0.111	41	5.51	11.3	317.4	Clear	None
10:55	5	25	250	15.65	0.00	5.36	0.108	44.8	7.05	10.6	309.3	Clear	None
11:00	5	30	250	15.65	0.00	5.44	0.112	35.2	7.87	10	295.2	Clear	None
11:05	5	35	250	15.65	0.00	5.5	0.114	31.8	8.02	10.1	281.7	Clear	None
11:10	5	40	250	15.65	0.00	5.55	0.119	28.2	8.42	10.2	268.8	Clear	None
11:15	5	45	250	15.65	0.00	5.62	0.124	25.6	8.81	10.1	255.1	Clear	None
11:20	5	50	250	15.65	0.00	5.72	0.13	24.5	9.12	9.8	240.9	Clear	None
11:25	5	55	250	15.65	0.00	5.78	0.136	23.5	9.19	9.8	232.2	Clear	None
11:30	5	60	250	15.65	0.00	5.87	0.143	22.1	9.3	9.9	215.1	Clear	None
11:35	5	65	250	15.65	0.00	5.92	0.148	22.8	9.37	10	203.7	Clear	None
11:40	5	70	250	15.65	0.00	5.95	0.149	20.9	9.4	10.1	195.5	Clear	None
11:45	5	75	250	15.65	0.00	6.05	0.168	21	9.41	10.2	183.5	Clear	None
11:50	5	80	250	15.65	0.00	6.18	0.186	20.3	9.42	10.2	162	Clear	None
11:55	5	85	250	15.65	0.00	6.24	0.204	19.7	9.49	10.1	148.5	Clear	None
12:00	5	90	250	15.65	0.00	6.38	0.242	18.7	9.51	10.2	120	Clear	None
12:05	5	95	250	15.65	0.00	6.49	0.265	18.8	9.53	10.1	90	Clear	None
12:10	5	100	250	15.65	0.00	6.5	0.412	25.6	4	11.4	47	Clear	None
12:15	5	105	250	16.1	0.00	6.56	0.437	21.9	2.35	11.6	30	Clear	None
12:20	5	110	250	16.45	0.00	6.68	0.448	19.7	1.35	11.5	2	Clear	None
12:25	5	115	250	16.8	0.00	6.75	0.458	17.1	1.02	11.4	-24.3	Clear	None
12:30	5	120	250	16.8	0.00	6.79	0.471	15.8	0.91	11.1	-41.3	Clear	None

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

12:35	5	125	250	16.8	0.00	6.8	0.48	13.7	0.88	11.3	-44.2	Clear	None
12:40	5	130	250	16.8	0.00	6.84	0.493	13.8	0.83	11.2	-52.6	Clear	None
12:45	5	135	250	16.8	0.00	6.88	0.512	12.4	0.79	11	-62	Clear	None
12:50	5	140	250	16.8	0.00	6.89	0.517	11.8	0.76	10.9	-66.5	Clear	None
12:55	5	145	250	16.8	0.00	6.91	0.523	11.5	0.77	10.8	-70.5	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: SHP

Condition of Well: Good condition,Missing bolts

Well Completion: Flush mount

Well Locked at Arrival: no

Well Locked at Departure: no

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-93-24A			**Date**	10/26/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	44.6 degrees F and Light Rain. The wind is blowing NE at 12.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	16.7	**Total Depth (ft-bmp)**	25.91	**Water Column(ft)**	9.21	**Gallons in Well**	9.35
MP Elevation		**Pump Intake (ft-bmp)**	22.91	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:30	**Volumes Purged**	0.28	**Sample ID**	SHM-93-24A-FAL20	**Sampled by**	Nicholas Burch
Purge Start	14:46	**Gallons Purged**	2.64	**Replicate/ Code No.**			
Purge End	15:40						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:50	0	0	250	16.65	0.00	6.1	0.467	8.86	8.8	11.9	140	Clear	None
14:55	5	5	250	16.65	0.00	5.88	0.467	4.19	8.15	12.1	170.6	Clear	None
15:00	5	10	250	16.65	0.00	5.87	0.465	4.23	8.11	12.1	199.5	Clear	None
15:05	5	15	250	16.65	0.00	5.86	0.461	3.04	8.11	12.1	214	Clear	None
15:10	5	20	250	16.65	0.00	5.86	0.461	3.3	8.16	12	227	Clear	None
15:15	5	25	250	16.65	0.00	5.86	0.462	2.97	8.03	12.1	239.5	Clear	None
15:20	5	30	250	16.65	0.00	5.86	0.462	3.29	8.08	12	248	Clear	None
15:23	3	33	250	16.65	0.00	5.86	0.462	3.12	8.09	12	250	Clear	None
15:26	3	36	250	16.65	0.00	5.86	0.46	2.99	8.09	12	257.2	Clear	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: SHM

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHL-19			**Date**	10/26/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	44.1 degrees F and Light Rain and Fog/Mist. The wind is blowing NW at 12.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	23.9	**Total Depth (ft-bmp)**	30	**Water Column(ft)**	6.1	**Gallons in Well**	3.96
MP Elevation		**Pump Intake (ft-bmp)**	28	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:50	**Volumes Purged**	0.72	**Sample ID**	SHL-19-FAL20	**Sampled by**	Diane Champagne
Purge Start	13:35	**Gallons Purged**	2.85	**Replicate/ Code No.**			
Purge End	15:07						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:40	0	0	140	23.91	0.00	6.98	0.176	224.03	4.08	9.7	141	Orange	None
13:45	5	5	140	23.91	0.00	6.96	0.176	182.73	3.99	9.7	141.5	Orange	None
13:50	5	10	140	23.91	0.00	6.9	0.175	135.23	3.75	9.9	142.2	Orange	None
13:55	5	15	140	23.91	0.00	6.86	0.175	92.86	3.65	10	142.3	Orange	None
14:00	5	20	140	23.91	0.00	6.84	0.175	68.47	3.56	9.9	142.3	Orange	None
14:05	5	25	140	23.91	0.00	6.81	0.174	51.57	3.49	10	142.2	Orange	None
14:10	5	30	140	23.91	0.00	6.79	0.175	38.46	3.56	9.8	142.4	Orange	None
14:15	5	35	140	23.91	0.00	6.78	0.175	31.05	3.78	9.8	142.2	Orange	None
14:21	6	41	140	23.91	0.00	6.77	0.176	27.42	3.93	10	141.9	Orange	None
14:25	4	45	140	23.9	0.00	6.77	0.176	21.7	3.97	10	141.8	Orange	None
14:30	5	50	140	23.9	0.00	6.76	0.177	19.91	4.03	9.9	141.7	Orange	None
14:36	6	56	140	23.9	0.00	6.75	0.177	15.91	4.25	10	141.8	Orange	None
14:40	4	60	140	23.91	0.00	6.74	0.177	14.54	4.3	10	141.8	Orange	None
14:45	5	65	140	23.91	0.00	6.74	0.178	15.93	4.35	9.9	142	Orange	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Information

Well Location:	Side of barrier wall	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHL-24			**Date**	10/26/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	42 °F, Overcast, N winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	16.98	**Total Depth (ft-bmp)**	119.5	**Water Column(ft)**	102.52	**Gallons in Well**	66.63
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:15	**Volumes Purged**		**Sample ID**	SHL-24-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	15:00	**Gallons Purged**		**Replicate/ Code No.**	SHL-DUP09-FAL20		
Purge End	16:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:05	0	0	250	17.3	0.00	6.93	0.202	-4.2	2.68	11.5	158.9	Clear	None
15:08	3	3	250	17.4	0.00	6.94	0.202	-4.5	2.7	11.5	158.9	Clear	None
15:11	3	6	250	17.45	0.00	6.97	0.202	-4.4	2.66	11.4	159.4	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	SHL	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-05-39A			**Date**	10/26/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	42 °F, Cold, N winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.61	**Total Depth (ft-bmp)**	38.9	**Water Column(ft)**	26.29	**Gallons in Well**	4.27
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:10	**Volumes Purged**		**Sample ID**	SHM-05-39A	**Sampled by**	Connor Rosenbaum
Purge Start	12:19	**Gallons Purged**		**Replicate/ Code No.**			

Purge End

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:01	0	0	250	12.61	0.00							Clear	None
12:25	24	24	250	12.76	0.00	6.47	0.151	50.2	2.38	12.5	198.3	Clear	None
12:30	5	29	250	12.75	0.00	6.36	0.152	43.5	2.09	12.6	197.6	Clear	None
12:40	10	39	250	12.75	0.00	6.32	0.152	38.8	1.93	12.5	197.1	Clear	None
12:45	5	44	250	12.75	0.00	6.3	0.152	34.4	1.79	12.3	196.5	Clear	None
12:50	5	49	250	12.75	0.00	6.29	0.151	33	1.7	12.2	196.3	Clear	None
12:55	5	54	250	12.75	0.00	6.28	0.15	33.5	1.71	12.1	196.1	Clear	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: SHM

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

Well Completion: Flush mount

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-13-15			**Date**	10/29/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	45.0 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.15	**Total Depth (ft-bmp)**	62.25	**Water Column(ft)**	58.1	**Gallons in Well**	14.75
MP Elevation		**Pump Intake (ft-bmp)**	60.25	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:30	**Volumes Purged**	0.17	**Sample ID**	SHM-13-15-FAL20	**Sampled by**	Nick Burch
Purge Start	10:50	**Gallons Purged**	2.44	**Replicate/ Code No.**			
Purge End	11:40						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:55	0	0	250	4.15	0.00	7.04	0.373	2.4	1.63	11.3	229.8	Clear	Mild
11:00	5	5	250	4.15	0.00	6.88	0.375	2.1	1.47	11.3	230.2	Clear	Mild
11:03	3	8	250	4.15	0.00	6.54	0.386	11.6	0.96	11.2	219.2	Clear	Mild
11:06	3	11	250	4.15	0.00	6.52	0.394	14.45	0.89	11.2	208.7	Clear	Mild
11:09	3	14	250	4.15	0.00	6.52	0.402	14.7	0.84	11.2	187.2	Clear	Mild
11:12	3	17	250	4.15	0.00	6.53	0.407	14.67	0.8	11.2	164.4	Clear	Mild
11:15	3	20	250	4.15	0.00	6.54	0.407	14.37	0.74	11.1	104.2	Clear	Mild
11:18	3	23	250	4.15	0.00	6.55	0.405	14.5	0.72	11.1	63.5	Clear	Mild
11:21	3	26	250	4.15	0.00	6.55	0.4	13.91	0.69	11.1	13.57	Clear	Mild
11:24	3	29	250	4.15	0.00	6.56	0.397	13.75	0.67	11.2	20.7	Clear	Mild
11:27	3	32	250	4.15	0.00	6.56	0.394	12.7	0.67	11.2	14.5	Clear	Mild

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: SHM

Well Locked at Arrival: no

Condition of Well: Good condition

Well Locked at Departure: no

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-13-14S			**Date**	10/29/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	46.9 degrees F and Light Rain and Fog/Mist. The wind is blowing S/SE at 16.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	3.8	**Total Depth (ft-bmp)**	18.8	**Water Column(ft)**	15	**Gallons in Well**	3.81
MP Elevation		**Pump Intake (ft-bmp)**	16.8	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:50	**Volumes Purged**	0.47	**Sample ID**	SHM-13-14S	**Sampled by**	Nick
Purge Start	13:20	**Gallons Purged**	1.78	**Replicate/ Code No.**			
Purge End	14:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:23	0	0	250	3.8	0.00	6.71	0.305	36	3	11.2	164	Clear	None
13:26	3	3	250	3.8	0.00	5.91	0.305	15.5	0.95	11.3	173.8	Clear	None
13:29	3	6	250	3.8	0.00	5.89	0.305	13.9	0.89	11.4	172.9	Clear	None
13:32	3	9	250	3.8	0.00	5.86	0.304	10.8	0.83	11.3	169.5	Clear	None
13:35	3	12	250	3.8	0.00	5.84	0.304	10.8	0.79	11.3	166.8	Clear	None
13:38	3	15	250	3.8	0.00	5.84	0.304	10	0.73	11.4	162.3	Clear	None
13:41	3	18	250	3.8	0.00	5.83	0.304	6.8	0.71	11.3	160.4	Clear	None
13:44	3	21	250	3.8	0.00	5.83	0.305	6.4	0.69	11.4	159	Clear	None
13:47	3	24	250	3.8	0.00	5.83	0.305	5.9	0.67	11.4	157.8	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	SHM	Well Locked at Arrival:	no
Condition of Well:	Good condition,Missing lock	Well Locked at Departure:	no
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHL-11			**Date**	10/29/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	45.0 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	18.9	**Total Depth (ft-bmp)**	29.7	**Water Column(ft)**	10.8	**Gallons in Well**	1.75
MP Elevation		**Pump Intake (ft-bmp)**	27	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time		**Volumes Purged**	1.66	**Sample ID**	SHL-11-FAL20	**Sampled by**	Diane Champagne
Purge Start		**Gallons Purged**	2.91	**Replicate/ Code No.**			
Purge End	10:45						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:50	0	0	200	18.9	0.00	6.94	0.63	27.06	2.15	10.6	152.3	Black	Medium
10:56	6	6	200	18.91	0.00	6.71	0.536	73.32	0.74	10.7	94.3	Black	Medium
11:01	5	11	200	18.91	0.00	6.64	0.534	883.11	0.63	10.8	74.2	Black	Medium
11:07	6	17	200	18.91	0.00	6.6	0.532	142.11	0.59	10.7	53.9	Black	Medium
11:10	3	20	200	18.91	0.00	6.59	0.532	94.75	0.58	10.7	52.6	Black	Medium
11:16	6	26	200	18.91	0.00	6.56	0.533	113.41	0.56	10.6	44.1	Black	Medium
11:20	4	30	200	18.91	0.00	6.56	0.533	110.87	0.55	10.7	39.6	Black	Medium
11:25	5	35	200	18.91	0.00	6.55	0.533	66.8	0.54	10.6	34.1	Black	Medium
11:30	5	40	200	18.93	0.00	6.54	0.533	35.89	0.53	10.6	29.3	Black	Medium
11:35	5	45	200	18.93	0.00	6.53	0.533	34.13	0.53	10.6	24.7	Black	Medium
11:40	5	50	200	18.93	0.00	6.53	0.534	35.8	0.52	10.6	21.5	Black	Medium

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Barrier wall , painted orange

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHL-20			**Date**	10/29/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	46.0 degrees F and Light Rain and Fog/Mist. The wind is blowing S/SE at 20.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	18.8	**Total Depth (ft-bmp)**	50.25	**Water Column(ft)**	31.45	**Gallons in Well**	20.44
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:50	**Volumes Purged**	0.13	**Sample ID**	SHL-20-FAL20	**Sampled by**	Diane Champagne
Purge Start	14:10	**Gallons Purged**	2.58	**Replicate/ Code No.**			

Purge End

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:15	0	0	250	18.8	0.00	6.47	0.516	12.9	3.33	10.5	36.5	Clear	None
14:20	5	5	250	18.8	0.00	6.46	0.516	11.49	3.38	10.5	30.1	Clear	None
14:25	5	10	250	18.8	0.00	6.46	0.515	10.91	3.26	10.5	26.2	Clear	None
14:30	5	15	250	18.8	0.00	6.46	0.513	11.48	3.25	10.6	23.1	Clear	None
14:35	5	20	250	18.8	0.00	6.45	0.513	11.2	3.05	10.5	20.7	Clear	None
14:40	5	25	250	18.8	0.00	6.45	0.514	10.89	3.37	10.4	18.9	Clear	None
14:45	5	30	250	18.8	0.00	6.45	0.513	10.7	3.37	10.4	17.1	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Barrier wall

Condition of Well: Good condition

Well Completion: NA

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EPA-PZ-2012-4B			**Date**	10/29/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	45.0 degrees F and Rain and Fog/Mist. The wind is blowing NE at 16.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	16.18	**Total Depth (ft-bmp)**	77	**Water Column(ft)**	60.82	**Gallons in Well**	2.47
MP Elevation		**Pump Intake (ft-bmp)**	72.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	16:30	**Volumes Purged**	0.75	**Sample ID**	EPA-PZ-04B-FAL20	**Sampled by**	
Purge Start	15:45	**Gallons Purged**	1.85	**Replicate/ Code No.**	SHL-DUP05-FAL20		
Purge End	16:50						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:55	0	0	150	16.38	0.00	6.52	0.403	37.95	6.17	10.2	26	Brown	None
16:00	5	5	150	16.18	0.00	6.5	0.432	37.22	4.33	10.1	22.3	Brown	None
16:06	6	11	150	16.18	0.00	6.47	0.442	36.37	4.06	9.8	18.6	Brown	None
16:10	4	15	150	16.18	0.00	6.46	0.456	33.44	3.33	9.4	14.8	Brown	None
16:16	6	21	150	16.18	0.00	6.46	0.458	34.83	3.43	9.3	14.5	Brown	None
16:20	4	25	150	16.18	0.00	6.46	0.457	34.1	3.59	9.2	12.2	Brown	None
16:25	5	30	150	16.18	0.00	6.46	0.468	33.25	3.51	9.1	5.4	Brown	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Next to system fence gate	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	EPA Key

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-13-03			**Date**	10/29/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	46 °F, Overcast, N winds at 1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.5	**Total Depth (ft-bmp)**	14.33	**Water Column(ft)**	8.83	**Gallons in Well**	1.43
MP Elevation		**Pump Intake (ft-bmp)**	10	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:30	**Volumes Purged**		**Sample ID**	SHM-13-03-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	11:44	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	12:45						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:44	0	0	250	5.56	0.00	4.91	0.252	13.5	1.54	10.4	111	Clear	None
11:47	3	3	250	5.6	0.00	4.84	0.255	7.39	1.44	10.5	103	Clear	None
11:50	3	6	250	5.56	0.00	4.81	0.261	6.15	1.4	10.5	94	Clear	None
11:53	3	9	250	5.56	0.00	4.8	0.268	6.07	1.3	11	77	Clear	None
11:57	4	13	250	5.56	0.00	4.82	0.281	4.8	1.27	11	55.2	Clear	None
12:00	3	16	250	5.56	0.00	4.84	0.284	5.3	1.27	10.8	52.9	Clear	None
12:03	3	19	250	5.56	0.00	4.85	0.282	4.03	1.28	10.7	47.3	Clear	None
12:06	3	22	250	5.56	0.00	4.86	0.297	4.36	1.2	10.9	33.6	Clear	None
12:10	4	26	250	5.56	0.00	4.89	0.3	5.5	1.2	10.9	26.8	Clear	None
12:13	3	29	250	5.56	0.00	4.9	0.308	5.7	1.2	10.8	21.2	Clear	None
12:15	2	31	250	5.56	0.00	4.92	0.313	5.5	1.17	10.8	15.9	Clear	None
12:19	4	35	250	5.56	0.00	4.93	0.315	5.6	1.15	10.8	14.4	Clear	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Needs repairs

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-13-14D-FAL20			**Date**	10/29/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	46 °F, Overcast, N winds at 1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	3.76	**Total Depth (ft-bmp)**	57.5	**Water Column(ft)**	53.74	**Gallons in Well**	8.73
MP Elevation		**Pump Intake (ft-bmp)**	54	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:50	**Volumes Purged**		**Sample ID**	SHM-13-14D-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	13:24	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	14:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:24	0	0	250	3.76	0.00	5.88	0.405	70	4.17	11.4	64	Clear	None
13:28	4	4	250	3.76	0.00	5.79	0.408	70.5	3.74	11.4	70	Clear	None
13:32	4	8	250	3.76	0.00	5.73	0.409	70.5	3.62	11.2	74.9	Clear	None
13:35	3	11	250	3.76	0.00	5.67	0.407	65.8	4.16	11.3	78.9	Clear	None
13:38	3	14	250	3.76	0.00	5.68	0.407	21.6	4.27	11.3	81	Clear	None
13:41	3	17	250	3.76	0.00	5.66	0.408	20.4	3.91	11.2	84.9	Clear	None
13:44	3	20	250	3.76	0.00	5.62	0.41	18.5	3.7	11.1	89.1	Clear	None
13:47	3	23	250	3.76	0.00	5.6	0.41	14.7	3.62	11.1	91.1	Clear	None
13:50	3	26	250	3.76	0.00	5.58	0.41	14.5	3.61	11	92.6	Clear	None
13:53	3	29	250	3.76	0.00	5.57	0.409	14.3	3.62	10.9	94.3	Clear	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Well Locked at Arrival: no

Condition of Well: Good condition,Missing lock

Well Locked at Departure: no

Well Completion: Stick-up

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EW-01			**Date**	10/30/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	33.1 degrees F and Light Snow and Fog/Mist. The wind is blowing N at 20.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	6	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	0	**Total Depth (ft-bmp)**	85	**Water Column(ft)**	85	**Gallons in Well**	124.31
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Volumetric	**Sample Method**	Low-Flow
Sample Time	08:10	**Volumes Purged**		**Sample ID**	EW-01-FAL20	**Sampled by**	Diane Champagne
Purge Start	08:10	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	08:17						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:29	0	0	150		0.00	6.5	0.505	4.23	1.05	9.9	96.1	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well:

Well Completion: NA

Well Locked at Arrival: no

Well Locked at Departure: no

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EW-04			**Date**	10/30/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	33.1 degrees F and Light Snow and Fog/Mist. The wind is blowing N at 20.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	6	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	0	**Total Depth (ft-bmp)**	95	**Water Column(ft)**	95	**Gallons in Well**	138.93
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Volumetric	**Sample Method**	Grab
Sample Time	08:00	**Volumes Purged**		**Sample ID**	EW-04-FAL20	**Sampled by**	Diane Champagne
Purge Start	08:00	**Gallons Purged**		**Replicate/ Code No.**			

Purge End

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:37	0	0	150	0	0.00	6.76	0.264	6.18	2.11	6.7	74.7	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well:

Well Completion: Flush mount

Well Locked at Arrival: no

Well Locked at Departure: no

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EPA-PZ-2012-1A			**Date**	10/30/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	32.0 degrees F and Snow and Fog. The wind is blowing N/NE at 45.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.31	**Total Depth (ft-bmp)**	28	**Water Column(ft)**	15.69	**Gallons in Well**	0.64
MP Elevation		**Pump Intake (ft-bmp)**	25	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:05	**Volumes Purged**	2.89	**Sample ID**	EPA-PZ-2012-01A-FAL20	**Sampled by**	Diane Champagne
Purge Start	09:20	**Gallons Purged**	1.85	**Replicate/ Code No.**			

Purge End

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:26	0	0	150	12.31	0.00	7.07	0.086	72.57	2.13	6.6	70.1	Brown	None
09:30	4	4	150	12.44	0.00	6.73	0.087	26.62	1.61	6.8	79.5	Brown	None
09:35	5	9	150	12.54	0.00	6.52	0.084	28.61	1.59	7.1	89.4	Brown	None
09:40	5	14	150	12.6	0.00	6.53	0.084	29.68	1.3	7.1	89.5	Brown	None
09:45	5	19	150	12.6	0.00	6.55	0.082	27.5	0.97	7.2	89.3	Brown	None
09:52	7	26	150	12.71	0.00	6.56	0.082	36.87	0.83	7.3	89.2	Brown	None
09:56	4	30	150	12.71	0.00	6.58	0.081	37.36	0.8	7.2	89.1	Brown	None
10:00	4	34	150	12.71	0.00	6.59	0.081	37.23	0.78	7.2	88.8	Brown	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	In the woods behind the dumpster	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	EPA key

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EPA-PZ-2012-1B			**Date**	10/30/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	30.9 degrees F and Heavy Snow and Fog. The wind is blowing N at 25.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.11	**Total Depth (ft-bmp)**	78.56	**Water Column(ft)**	66.45	**Gallons in Well**	2.7
MP Elevation		**Pump Intake (ft-bmp)**	76	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:10	**Volumes Purged**	0.68	**Sample ID**	EPA-PZ-2012-1B	**Sampled by**	Diane Champagne
Purge Start	10:25	**Gallons Purged**	1.85	**Replicate/ Code No.**			
Purge End	11:47						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:35	0	0	150	12.12	0.00	6.34	0.421	7.11	1.04	6.3	82.3	Clear	None
10:41	6	6	150	12.12	0.00	6.31	0.43	7.03	0.91	6.4	80.4	Clear	None
10:45	4	10	150	12.12	0.00	6.32	0.43	7.42	0.83	6.5	79.4	Clear	None
10:50	5	15	150	12.12	0.00	6.34	0.43	8.76	0.93	6.6	75.8	Clear	None
10:56	6	21	150	12.12	0.00	6.36	0.431	8.85	0.93	6.6	75.2	Clear	None
11:01	5	26	150	12.12	0.00	6.37	0.431	9.01	0.92	6.7	73.7	Clear	None
11:05	4	30	150	12.12	0.00	6.38	0.431	8.77	0.89	6.7	72.4	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Woods behind dumpster	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	EPA well

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-10-14			**Date**	10/30/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	33.1 degrees F and Light Snow and Fog/Mist. The wind is blowing N at 20.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21.15	**Total Depth (ft-bmp)**	82.2	**Water Column(ft)**	61.05	**Gallons in Well**	15.5
MP Elevation		**Pump Intake (ft-bmp)**	79.2	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:10	**Volumes Purged**	6.52	**Sample ID**	SHM-10-14-FAL20	**Sampled by**	Nick Burch
Purge Start	09:35	**Gallons Purged**	101.12	**Replicate/ Code No.**			
Purge End	11:20						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:57	0	0	250	21.15	0.00	6.41	0.252	45	2.19	8.3	-56	Clear	None
10:00	3	3	250	21.15	0.00	6.38	0.251	42	2.01	8	-56.1	Clear	None
10:05	5	8	250	21.2	0.00	6.33	0.247	45	1.65	7.8	-58	Clear	None
10:10	5	13	250	21.2	0.00	6.3	0.246	32.5	1.4	7.8	-60.4	Clear	None
10:15	5	18	250	21.2	0.00	6.29	0.249	30	1.27	7.8	-61.7	Clear	None
10:20	5	23	250	21.2	0.00	6.28	0.252	21.5	1.14	8	-63.3	Clear	None
10:25	5	28	250	21.2	0.00	6.28	0.253	15	1.03	7.9	-64.9	Clear	None
10:30	5	33	250	21.2	0.00	6.28	0.251	12.5	0.98	7.4	-65.7	Clear	None
10:35	5	38	250	21.2	0.00	6.28	0.245	12.7	0.98	6.6	-66.5	Clear	None
10:40	5	43	250	21.2	0.00	6.28	0.239	23.5	1.04	6	-66.5	Clear	None
10:45	5	48	250	21.2	0.00	6.27	0.24	21.7	1.01	6.1	-66.2	Clear	None
10:50	5	53	250	21.2	0.00	6.27	0.239	15.5	0.98	5.8	-66.3	Clear	None
10:53	3	56	250	21.2	0.00	6.27	0.239	15	0.95	5.9	-66.4	Clear	None
10:56	3	59	250	21.2	0.00	6.27	0.24	13.8	0.94	6	-66.5	Clear	None
10:59	3	62	250	21.2	0.00	6.27	0.242	11.5	0.92	6.2	-66.8	Clear	None
10:02	1383	5	250	21.2	0.00	6.27	0.242	10.9	0.92	6.3	-67.1	Clear	None
11:06	64	69	250	21.2	0.00	6.28	0.244	10.7	0.93	6.3	-67.4	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	SHM	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EPA-PZ-2012-4A			**Date**	10/30/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	30.0 degrees F and Snow and Fog. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	16.11	**Total Depth (ft-bmp)**	24.56	**Water Column(ft)**	8.45	**Gallons in Well**	0.34
MP Elevation		**Pump Intake (ft-bmp)**	22	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:55	**Volumes Purged**	11.85	**Sample ID**	EPA-PZ-2012-4A-FAL20	**Sampled by**	Diane Champagne
Purge Start	12:15	**Gallons Purged**	4.03	**Replicate/ Code No.**			

Purge End

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:25	0	0	150	16.22	0.00	6.57	0.291	31.73	4.12	6.2	46.3	Clear	None
12:30	5	5	150	16.3	0.00	6.5	0.294	28.2	7.97	6.4	40	Clear	None
12:35	5	10	150	16.31	0.00	6.49	0.294	26.24	7.56	6.4	35.9	Clear	None
12:40	5	15	150	16.31	0.00	6.48	0.294	25.03	7.36	6.2	32.9	Clear	None
12:45	5	20	150	16.3	0.00	6.48	0.293	25.75	7.09	6.6	29.7	Clear	None
12:50	5	25	150	16.3	1.39	6.48	0.292	16.08	6.82	6.5	28.2	Clear	None
12:56	6	31	150	16.3	0.00	6.47	0.29	17.33	6.2	6.7	25.6	Clear	None
13:00	4	35	150	16.31	0.00	6.47	0.29	14.1	5.87	6.8	24.1	Clear	None
13:06	6	41	150	16.31	0.00	6.47	0.291	17.96	5.32	7	21.7	Clear	None
13:10	4	45	150	16.31	0.00	6.47	0.289	19.11	4.78	7	19.1	Clear	None
13:16	6	51	150	16.31	0.00	6.47	0.288	16.2	4.58	7.2	18.2	Clear	None
13:25	9	60	150	16.31	0.00	6.47	0.284	15.69	4.06	7	15.4	Clear	None
13:31	6	66	150	16.31	0.00	6.47	0.287	10.79	3.71	7.1	13.7	Clear	None
13:36	5	71	150	16.31	0.00	6.47	0.285	10.17	3.44	7.2	12.3	Clear	None
13:40	4	75	150	16.31	3.37	6.47	0.284	10.36	3.25	7.4	11.1	Clear	None
13:45	5	80	150	16.31	0.00	6.47	0.283	10.77	3.08	7.3	10.1	Clear	None
13:50	5	85	150	16.3	4.03	6.47	0.282	10.24	2.95	7.3	9.1	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Next to system fence	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	EPA lock

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-10-13			**Date**	10/30/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	30.9 degrees F and Light Snow and Fog/Mist. The wind is blowing N at 41.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	26.75	**Total Depth (ft-bmp)**	73.05	**Water Column(ft)**	46.3	**Gallons in Well**	11.76
MP Elevation		**Pump Intake (ft-bmp)**	70.02	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:00	**Volumes Purged**	0.42	**Sample ID**	SHM-10-13-FAL20	**Sampled by**	Nick Burch
Purge Start	12:42	**Gallons Purged**	4.95	**Replicate/ Code No.**			
Purge End	14:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:00	0	0	250	26.75	0.00	6.99	0.246	53	3.67	8.5	8	Clear	None
13:05	5	5	250	26.75	0.00	6.7	0.248	35	2.41	8.6	19.2	Clear	None
13:10	5	10	250	26.75	0.00	6.57	0.25	34	1.52	8.6	12.1	Clear	None
13:15	5	15	250	26.75	0.00	6.55	0.249	28	1.43	8.3	6.7	Clear	None
13:20	5	20	250	26.75	0.00	6.53	0.229	38	1.45	5.8	3.3	Clear	None
13:25	5	25	250	26.75	0.00	6.5	0.251	35.4	1	7.9	-2.1	Clear	None
13:30	5	30	250	26.75	0.00	6.44	0.267	32	0.82	8.4	-16.1	Clear	None
13:35	5	35	250	26.75	0.00	6.4	0.279	27.5	0.78	8.2	-26.9	Clear	None
13:38	3	38	250	26.8	0.00	6.38	0.292	25.2	0.75	8.4	-34.2	Clear	None
13:41	3	41	250	26.8	0.00	6.37	0.308	16.8	0.73	8.4	-41.8	Clear	None
13:44	3	44	250	26.8	0.00	6.36	0.314	16.3	0.72	8.2	-46.8	Clear	None
13:47	3	47	250	26.8	0.00	6.35	0.324	16.6	0.71	8.3	-53.1	Clear	None
13:50	3	50	250	26.8	0.00	6.35	0.327	13.7	0.7	8.1	-57.5	Clear	None
13:54	4	54	250	26.8	0.00	6.35	0.33	13.2	0.7	8.1	-60.7	Clear	None
13:57	3	57	250	26.8	0.00	6.35	0.332	12.4	0.68	8.2	-64.6	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	SHM	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	N5-P1			**Date**	10/30/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	30.0 degrees F and Light Snow and Fog/Mist. The wind is blowing N/NW at 25.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	24.7	**Total Depth (ft-bmp)**	100.8	**Water Column(ft)**	76.1	**Gallons in Well**	3.09
MP Elevation		**Pump Intake (ft-bmp)**	27.7	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:00	**Volumes Purged**	0.73	**Sample ID**	N5-P1-FAL20	**Sampled by**	Nick Burch
Purge Start	14:25	**Gallons Purged**	2.25	**Replicate/ Code No.**			
Purge End	15:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:35	0	0	250	24.7	0.00	6.64	0.171	5.8	2.14	8.4	-32.7	Clear	None
14:38	3	3	250	24.75	0.00	6.66	0.172	4.85	1.47	8.8	-32.9	Clear	None
14:41	3	6	250	24.8	0.00	6.68	0.172	4.9	1.08	8.9	-33.2	Clear	None
14:44	3	9	250	24.85	0.00	6.69	0.172	4.8	0.98	8.8	-33.5	Clear	None
14:47	3	12	250	24.9	0.00	6.71	0.172	5.25	0.85	8.9	-34.4	Clear	None
14:50	3	15	250	24.95	0.00	6.73	0.172	5.8	0.79	9	-35.1	Clear	None
14:53	3	18	250	24.95	0.00	6.75	0.171	6.1	0.73	8.9	-36.3	Clear	None
14:56	3	21	250	24.95	0.00	6.76	0.172	5.85	0.71	9.1	-37.1	Clear	None
14:59	3	24	250	24.95	0.00	6.78	0.171	6	0.68	9.1	-38.3	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	SHM	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-10-06			**Date**	10/30/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	32.0 degrees F and Light Snow and Fog/Mist. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	20.44	**Total Depth (ft-bmp)**	81	**Water Column(ft)**	60.56	**Gallons in Well**	5.54
MP Elevation		**Pump Intake (ft-bmp)**	76	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:40	**Volumes Purged**	0.58	**Sample ID**	SHM-10-06-FAL20	**Sampled by**	Diane Champagne
Purge Start	14:35	**Gallons Purged**	3.24	**Replicate/ Code No.**			

Purge End

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:40	0	0	200	20.44	0.00	6.42	0.477	13.19	3.11	7.3	20.3	Yellow	None
14:45	5	5	200	20.5	0.00	6.4	0.477	14.16	1.24	7.8	16.9	Yellow	None
14:50	5	10	200	20.51	0.00	6.4	0.484	16.74	0.98	8	14.3	Yellow	None
14:56	6	16	200	20.51	0.00	6.42	0.483	37.56	0.96	8	9.6	Yellow	None
15:01	5	21	200	20.51	0.00	6.44	0.483	34.88	0.89	7.9	6.8	Yellow	None
15:05	4	25	200	20.51	0.00	6.45	0.483	31.97	0.92	8.1	4.6	Yellow	None
15:10	5	30	200	20.51	0.00	6.46	0.481	42.15	0.69	8.1	1.5	Yellow	None
15:15	5	35	200	20.51	1.92	6.47	0.481	28.71	0.74	8.3	-1.1	Yellow	None
15:20	5	40	200	20.51	0.00	6.48	0.479	27.11	0.75	8.4	-5.1	Yellow	None
15:25	5	45	200	20.51	0.00	6.49	0.479	26.51	0.76	8.3	-10.3	Yellow	None
15:35	10	55	200	20.51	0.00	6.5	0.479	28.3	0.77	8.3	-10.6	Yellow	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Barrier wall

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: Odd SHL lock, replaced with a 2006 lock

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-99-31B			**Date**	10/30/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	28 °F, Snow, W winds at 11 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.7	**Total Depth (ft-bmp)**	61.3	**Water Column(ft)**	56.6	**Gallons in Well**	9.2
MP Elevation		**Pump Intake (ft-bmp)**	58	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:00	**Volumes Purged**		**Sample ID**	SHM-99-31B-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	13:19	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	14:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:19	0	0	250	4.75	0.00	7.11	0.079	4.8	7.79	6.5	52	Clear	None
13:22	3	3	250	4.75	0.00	6.96	0.076	5.2	7.34	5.9	65	Clear	None
13:25	3	6	250	4.75	0.00	6.87	0.077	4.3	7.06	6.3	75.9	Clear	None
13:28	3	9	250	4.75	0.00	6.82	0.076	5.2	6.91	6.1	-84.2	Clear	None
13:31	3	12	250	4.75	0.00	6.78	0.077	5.6	6.81	6.8	-89.6	Clear	None
13:35	4	16	250	4.75	0.00	6.79	0.078	4.3	6.67	6.9	93.4	Clear	None
13:38	3	19	250	4.75	0.00	6.78	0.078	5.5	6.54	6.9	97	Clear	None
13:41	3	22	250	4.75	0.00	6.78	0.077	5	6.48	6.8	97.5	Clear	None
13:44	3	25	250	4.75	0.00	6.78	0.077	5.3	6.46	6.7	97.6	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	In creek bed edge	Well Locked at Arrival:	no
Condition of Well:	Good condition	Well Locked at Departure:	no
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-99-31C			**Date**	10/30/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	28 °F, Snow, W winds at 8 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.03	**Total Depth (ft-bmp)**	79.85	**Water Column(ft)**	74.82	**Gallons in Well**	12.16
MP Elevation		**Pump Intake (ft-bmp)**	75	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:30	**Volumes Purged**		**Sample ID**	SHM-99-31C-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	14:51	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	15:45						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:58	0	0	250	5.06	0.00	6.76	0.291	6.1	2.2	5.6	-14.6	Clear	None
15:01	3	3	250	5.06	0.00	6.63	0.301	4.6	1.57	6.2	-22.8	Clear	None
15:04	3	6	250	5.06	0.00	6.61	0.307	5.4	1.36	6.6	-27.8	Clear	None
15:07	3	9	250	5.06	0.00	6.61	0.307	4.8	1.23	6.8	-31.9	Clear	None
15:10	3	12	250	5.06	0.00	6.61	0.31	4.8	1.16	6.9	-34.3	Clear	None
15:13	3	15	250	5.06	0.00	6.61	0.309	5.1	1.11	6.7	-36.2	Clear	None
15:16	3	18	250	5.06	0.00	6.61	0.308	4.6	1.1	6.7	-37.1	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-99-32X			**Date**	10/30/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	31 °F, Snow, N winds at 11 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.67	**Total Depth (ft-bmp)**	48	**Water Column(ft)**	37.33	**Gallons in Well**	6.07
MP Elevation		**Pump Intake (ft-bmp)**	44	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:20	**Volumes Purged**		**Sample ID**	SHM-99-32X-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	11:26	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	12:31						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:30	0	0	250	10.7	0.00	7.82	0.244	23.9	3.6	8.9	22.5	Clear	None
11:34	4	4	250	10.7	0.00	7.27	0.248	20.9	1.94	8.8	5.5	Clear	None
11:37	3	7	250	10.7	0.00	7.08	0.247	19.7	1.53	8.7	-4.1	Clear	None
11:41	4	11	250	10.7	0.00	6.9	0.248	19.4	1.25	8.9	-13.2	Clear	None
11:45	4	15	250	10.7	0.00	6.79	0.247	19.7	1.16	8.9	-20.4	Clear	None
11:51	6	21	250	10.7	0.00	6.71	0.245	17.2	1.07	9.1	-28.4	Clear	None
11:54	3	24	250	10.7	0.00	6.68	0.243	15.2	1.04	8.9	-31.2	Clear	None
11:57	3	27	250	10.7	0.00	6.66	0.243	12.4	1.03	9	-32.9	Clear	None
12:00	3	30	250	10.7	0.00	6.65	0.241	11.5	1.04	8.8	-34.8	Clear	None
12:04	4	34	250	10.7	0.00	6.63	0.241	11.4	1.06	8.8	-36.1	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-99-29X			**Date**	11/02/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	36.0 degrees F and Clear. The wind is blowing W/NW at 37.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	24.8	**Total Depth (ft-bmp)**	30.9	**Water Column(ft)**	6.1	**Gallons in Well**	1.55
MP Elevation		**Pump Intake (ft-bmp)**	27.8	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:55	**Volumes Purged**	5.03	**Sample ID**	SHP-99-29X-FAL20	**Sampled by**	Nicholas Burch
Purge Start	08:53	**Gallons Purged**	7.79	**Replicate/ Code No.**			
Purge End	11:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:20	0	0	250	24.8	0.00	5.97	0.137	198	2.62	9.3	-5.5	Clear	None
09:23	3	3	250	24.85	0.00	5.94	0.133	200	2.08	8.9	-2.3	Clear	None
09:26	3	6	250	24.85	0.00	5.92	0.131	199	2	8.7	-2.1	Clear	None
09:30	4	10	250	24.85	0.00	5.91	0.127	201	1.92	8.2	-1.7	Clear	None
09:35	5	15	250	24.85	0.00	5.92	0.123	201	1.84	7.8	-1.8	Clear	None
09:40	5	20	250	24.8	0.00	5.93	0.122	157	1.86	7.9	-2.5	Clear	None
09:45	5	25	250	24.8	0.00	5.96	0.125	157	1.86	8.9	-5.1	Clear	None
09:50	5	30	250	24.8	0.00	5.98	0.128	156	1.88	9.6	-6.6	Clear	None
09:55	5	35	250	24.8	0.00	5.98	0.128	159	1.88	9.5	-7.6	Clear	None
10:00	5	40	250	24.8	0.00	5.97	0.125	125	1.89	9.1	-7	Clear	None
10:05	5	45	250	24.8	0.00	5.97	0.124	118	1.86	8.8	-6	Clear	None
10:10	5	50	250	24.8	0.00	5.96	0.121	118	1.83	8.1	-4.6	Clear	None
10:15	5	55	250	24.8	0.00	5.96	0.12	101	1.76	8.1	-4	Clear	None
10:18	3	58	250	24.8	0.00	5.96	0.121	100.8	1.74	8.4	-3.8	Clear	None
10:21	3	61	250	24.8	0.00	5.96	0.123	101	1.73	9	-4	Clear	None
10:25	4	65	250	24.8	0.00	5.95	0.125	120	1.75	9.4	-4	Clear	None
10:30	5	70	250	24.8	0.00	5.95	0.125	80	1.64	9.3	-3.9	Clear	None
10:35	5	75	250	24.8	0.00	5.94	0.123	79.5	1.6	8.8	-3	Clear	None
10:38	3	78	250	24.8	0.00	5.94	0.121	78.5	1.6	8.3	-2.4	Clear	None
10:41	3	81	250	24.8	0.00	5.94	0.119	76.5	1.6	8	-1.4	Clear	None
10:45	4	85	250	24.8	0.00	5.93	0.118	69.4	1.53	7.9	-0.5	Clear	None
10:48	3	88	250	24.8	0.00	5.92	0.117	68.9	1.53	7.7	0.4	Clear	None
10:51	3	91	250	24.8	0.00	5.92	0.118	67.9	1.5	7.9	0.2	Clear	None

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: SHP

Condition of Well: Good condition,Missing lock

Well Completion: Stick-up

Well Locked at Arrival: no

Well Locked at Departure: no

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-10-15			**Date**	11/02/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	37.9 degrees F and Mostly Cloudy. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	25.25	**Total Depth (ft-bmp)**	56.7	**Water Column(ft)**	31.45	**Gallons in Well**	7.98
MP Elevation		**Pump Intake (ft-bmp)**	53.7	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:15	**Volumes Purged**	0.45	**Sample ID**	SHM-10-15-FAL20	**Sampled by**	Nick Burch
Purge Start	12:15	**Gallons Purged**	3.57	**Replicate/ Code No.**			
Purge End	13:30						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:30	0	0	250	25.25	0.00	6.44	0.206	8.3	1.83	10.5	15.3	Clear	None
12:33	3	3	250	25.25	0.00	6.31	0.225	6.4	1.31	10.2	4	Clear	None
12:36	3	6	250	25.25	0.00	6.33	0.222	6.7	1.17	9.1	-9.3	Clear	None
12:39	3	9	250	25.25	0.00	6.34	0.225	7.2	1.06	9.4	-18.3	Clear	None
12:42	3	12	250	25.25	0.00	6.35	0.233	7.7	0.96	9.6	-26.3	Clear	None
12:45	3	15	250	25.25	0.00	6.35	0.233	8.6	0.93	9.5	-30.7	Clear	None
12:48	3	18	250	25.25	0.00	6.34	0.231	9.5	0.91	9.3	-34.5	Clear	None
12:51	3	21	250	25.25	0.00	6.34	0.231	14.5	0.91	9.2	-35.9	Clear	None
12:54	3	24	250	25.25	0.00	6.34	0.231	14.6	0.88	9.4	-38	Clear	None
12:57	3	27	250	25.25	0.00	6.34	0.235	14.8	0.85	9.8	-40.6	Clear	None
13:00	3	30	250	25.25	0.00	6.34	0.236	14.7	0.87	9.7	-41.9	Clear	None
13:03	3	33	250	25.25	0.00	6.34	0.234	19.3	0.85	8.8	-42.6	Clear	None
13:06	3	36	250	25.25	0.00	6.34	0.228	19.5	0.86	8.8	-43.3	Clear	None
13:09	3	39	250	25.25	0.00	6.34	0.228	19.5	0.85	8.8	-43.6	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Information

Well Location:	SHM	Well Locked at Arrival:	no
Condition of Well:	Good condition,Missing lock	Well Locked at Departure:	no
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHL-15			**Date**	11/02/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	39.0 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21.15	**Total Depth (ft-bmp)**	26.6	**Water Column(ft)**	5.45	**Gallons in Well**	5.53
MP Elevation		**Pump Intake (ft-bmp)**	23.6	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time		**Volumes Purged**	0.31	**Sample ID**	SHL-15-FAL20	**Sampled by**	Nicholas Burch
Purge Start	13:40	**Gallons Purged**	1.72	**Replicate/ Code No.**			
Purge End	14:25						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:48	0	0	250	21.25	0.00	6.03	0.158	20.5	1.87	10.4	5	Clear	None
13:51	3	3	250	21.25	0.00	5.99	0.159	13.5	1.11	10.2	5.5	Clear	None
13:54	3	6	250	21.25	0.00	5.98	0.159	13.4	0.9	10.4	3.6	Clear	None
13:57	3	9	250	21.25	0.00	5.97	0.16	13.4	0.81	10.5	2.4	Clear	None
14:00	3	12	250	21.25	0.00	5.96	0.16	13.3	0.74	10.5	1.2	Clear	None
14:03	3	15	250	21.25	0.00	5.95	0.159	13.1	0.71	10.4	0	Clear	None
14:06	3	18	250	21.25	0.00	5.95	0.161	12.1	0.69	10.7	-1.4	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	SHL	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHL-12			**Date**	11/02/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	37.0 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	23.3	**Total Depth (ft-bmp)**	28.75	**Water Column(ft)**	5.45	**Gallons in Well**	1.38
MP Elevation		**Pump Intake (ft-bmp)**	26.75	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:45	**Volumes Purged**	2.63	**Sample ID**	SHL-12-FAL20	**Sampled by**	Nicholas Burch
Purge Start	14:50	**Gallons Purged**	3.63	**Replicate/ Code No.**			
Purge End	16:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:00	0	0	250	23.3	0.00	6.39	0.381	71.5	4	8.9	14.2	Clear	None
15:03	3	3	250	23.3	0.00	6.44	0.385	37.5	2.36	8.8	14.3	Clear	None
15:06	3	6	250	23.3	0.00	6.44	0.379	37.6	2.11	8.9	14.7	Clear	None
15:09	3	9	250	23.3	0.00	6.38	0.359	14.5	1.56	8.9	19.3	Clear	None
15:12	3	12	250	23.3	0.00	6.31	0.341	14	1.35	8.9	24.6	Clear	None
15:15	3	15	250	23.3	0.00	6.27	0.328	9.4	1.28	9.1	29.3	Clear	None
15:18	3	18	250	23.3	0.00	6.23	0.314	9.2	1.25	8.8	34	Clear	None
15:21	3	21	250	23.3	0.00	6.2	0.298	9.5	1.33	8.8	38.9	Clear	None
15:24	3	24	250	23.3	0.00	6.18	0.285	8.7	1.61	8.7	43.6	Clear	None
15:27	3	27	250	23.3	0.00	6.16	0.274	8.8	1.8	8.7	47	Clear	None
15:30	3	30	250	23.3	0.00	6.14	0.267	8.6	1.99	8.8	50.8	Clear	None
15:33	3	33	250	23.3	0.00	6.12	0.26	8.3	2.3	8.7	55.1	Clear	None
15:36	3	36	250	23.3	0.00	6.09	0.256	7.8	2.56	8.8	59.7	Clear	None
15:39	3	39	250	23.3	0.00	6.08	0.252	7.3	2.76	8.7	64.8	Clear	None
15:42	3	42	250	23.3	0.00	6.07	0.252	6.8	2.88	8.6	67.5	Clear	None
15:45	3	45	250	23.3	0.00	6.05	0.247	6.3	2.96	8.5	71.3	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	SHL	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-11-06			**Date**	11/02/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	37.9 degrees F and Clear. The wind is blowing W at 49.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	20.88	**Total Depth (ft-bmp)**	35	**Water Column(ft)**	14.12	**Gallons in Well**	2.29
MP Elevation		**Pump Intake (ft-bmp)**	30	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:35	**Volumes Purged**	0.81	**Sample ID**	SHM-11-06-FAL20	**Sampled by**	Diane Champagne
Purge Start	08:50	**Gallons Purged**	1.85	**Replicate/ Code No.**	SHL-DUP03-FAL20		

Purge End

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:00	0	0	200	20.88	0.00	7.36	0.54	18.14	0.76	9.4	67.9	Clear	None
09:05	5	5	200	20.9	0.00	7.3	0.533	24.53	0.57	9.3	56.4	Clear	None
09:10	5	10	200	20.91	0.00	7.3	0.534	27.47	0.55	9.2	55.9	Clear	None
09:15	5	15	200	20.92	0.00	7.24	0.531	12.48	0.5	9.2	48.9	Clear	None
09:21	6	21	200	20.92	0.00	7.22	0.531	10.79	0.48	9.2	47.1	Clear	None
09:27	6	27	200	20.92	0.00	7.18	0.531	10.85	0.46	9.2	43.3	Clear	None
09:30	3	30	200	20.92	0.00	7.16	0.533	10.41	0.46	9.2	41.3	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	2	HNO3
Alkalinity	250 mL Plastic	2	None
Chloride,Sulfate	125 mL Plastic	2	None
Dissolved Organic Carbon	250 mL Amber	2	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	PZ-12-01			**Date**	11/02/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	39.0 degrees F and Partly Cloudy. The wind is blowing W at 54.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21.08	**Total Depth (ft-bmp)**	34	**Water Column(ft)**	12.92	**Gallons in Well**	2.1
MP Elevation		**Pump Intake (ft-bmp)**	29	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:15	**Volumes Purged**	1.95	**Sample ID**	PZ-12-01-FAL20	**Sampled by**	Diane Champagne
Purge Start	10:10	**Gallons Purged**	4.10	**Replicate/ Code No.**			

Purge End

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:15	0	0	200	21.08	0.00	7.15	0.513	102.93	1.95	9	33.1	Orange	Mild
10:20	5	5	200	21.08	0.00	7.03	0.526	47.63	1.64	9.5	30.9	Orange	Mild
10:25	5	10	250	21.08	0.00	6.99	0.526	45.97	1.32		28.5	Orange	Mild
10:30	5	15	250	21.08	0.00	6.95	0.523	31.22	1.18	9	26.7	Orange	Mild
10:35	5	20	250	21.08	0.00	6.93	0.524	14.67	1.04	9	24.5	Orange	Mild
10:40	5	25	250	21.08	0.00	6.91	0.525	12.37	0.92	9.3	22.1	Orange	Mild
10:45	5	30	250	21.08	0.00	6.89	0.524	17.75	0.99	9.1	20.4	Orange	Mild
10:50	5	35	250	21.08	0.00	6.87	0.525	17.79	0.81	9.3	18.5	Orange	Mild
10:55	5	40	250	21.08	0.00	6.85	0.626	13.8	0.71	9.2	14.1	Orange	Mild
11:00	5	45	250	21.08	0.00	6.85	0.526	12.44	0.69	9.2	13.4	Orange	Mild
11:06	6	51	250	21.08	0.00	6.83	0.525	11.75	0.66	9	12.1	Orange	Mild
11:10	4	55	250	21.08	0.00	6.81	0.527	11.71	0.63	9.2	10.7	Orange	Mild

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Barrier wall

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	PZ-12-02			**Date**	11/02/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	39.0 degrees F and Mostly Cloudy. The wind is blowing undefined at 15			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	20.97	**Total Depth (ft-bmp)**	34	**Water Column(ft)**	13.03	**Gallons in Well**	2.12
MP Elevation		**Pump Intake (ft-bmp)**	29	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:00	**Volumes Purged**	3.51	**Sample ID**	PZ-12-02-FAL20	**Sampled by**	Diane Champagne
Purge Start	11:30	**Gallons Purged**	7.45	**Replicate/ Code No.**			
Purge End	13:06						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:35	0	0	320	21.01	0.00	6.67	0.632	18.61	0.91	10	18.3	Clear	None
11:41	6	6	320	21.02	0.00	6.67	0.631	61.41	4.22	9.8	13.9	Clear	None
11:45	4	10	320	21.03	0.00	6.65	0.633	131.23	5.12	10	13.2	Clear	None
11:50	5	15	320	21.03	0.00	6.65	0.632	98.22	3.76	10	10.7	Clear	None
11:55	5	20	320	21.03	0.00	6.62	0.629	63.4	6.33	9.9	10.2	Clear	None
12:00	5	25	320	21.03	0.00	6.61	0.632	69.73	6.55	9.8	8.6	Clear	None
12:05	5	30	320	21.05	0.00	6.6	0.628	75.77	7.42	10.2	5.8	Clear	None
12:10	5	35	320	21.05	0.00	6.6	0.627	62.14	7.03	10	4.6	Clear	None
12:15	5	40	320	21.06	0.00	6.6	0.628	70.71	6.82	10.3	3.1	Clear	None
12:20	5	45	320	21.05	0.00	6.59	0.625	14.08	6.44	9.9	1.1	Clear	None
12:25	5	50	320	21.05	0.00	6.6	0.628	10.08	1.67	10.5	-1.3	Clear	None
12:30	5	55	320	21.05	0.00	6.59	0.624	6.3	1.08	10.7	-2.4	Clear	None
12:35	5	60	320	21.05	0.00	6.59	0.624	2.4	1.11	10.2	-3.8	Clear	None
12:40	5	65	320	21.06	0.00	6.57	0.623	2.47	1.02	10.3	-4.9	Clear	None
12:45	5	70	320	21.06	0.00	6.57	0.624	2.8	0.69	10.2	-6.4	Clear	None
12:50	5	75	320	21.06	0.00	6.57	0.623	2.31	0.73	10.3	-7.6	Clear	None
12:55	5	80	320	21.06	0.00	6.56	0.621	1.96	0.69	10.2	-8.5	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	PZ-12-03			**Date**	11/02/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	39.0 degrees F and Cloudy. The wind is blowing undefined at 25 mph			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	19.92	**Total Depth (ft-bmp)**	34	**Water Column(ft)**	14.08	**Gallons in Well**	2.29
MP Elevation		**Pump Intake (ft-bmp)**	29	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:10	**Volumes Purged**	1.78	**Sample ID**	PZ-2012-03-FAL20	**Sampled by**	Diane Champagne
Purge Start	13:20	**Gallons Purged**	4.07	**Replicate/ Code No.**			
Purge End	14:24						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:25	0	0	320	19.92	0.00	6.68	0.513	7.46	7.19	8.8	-8.9	Yellow	None
13:31	6	6	320	19.92	0.00	6.63	0.512	7.99	7.96	8.9	-7.5	Yellow	None
13:35	4	10	320	19.93	0.00	6.62	0.512	32.99	0.85	8.6	-8.5	Yellow	None
13:40	5	15	320	19.93	0.00	6.62	0.51	34.04	0.58	8.6	-10.1	Yellow	None
13:45	5	20	320	19.93	0.00	6.63	0.509	33.01	0.46	8.6	-11.9	Yellow	None
13:50	5	25	320	19.93	0.00	6.63	0.507	34.04	0.43	8.6	-13.7	Yellow	None
13:55	5	30	320	19.93	0.00	6.63	0.506	31.2	0.4	8.7	-14.9	Yellow	None
14:00	5	35	320	19.93	0.00	6.63	0.505	30.2	0.39	8.6	-16.3	Yellow	None
14:05	5	40	320	19.94	0.00	6.63	0.504	30.04	0.37	8.5	-17.6	Yellow	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	Old SHL lock, changed to 2006 keyed lock

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	PZ-12-04			**Date**	11/02/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	37.0 degrees F and Cloudy. The wind is blowing undefined at 37 mph			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	20.9	**Total Depth (ft-bmp)**	34	**Water Column(ft)**	13.1	**Gallons in Well**	2.13
MP Elevation		**Pump Intake (ft-bmp)**	29	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	16:00	**Volumes Purged**	2.00	**Sample ID**	PZ-12-04-FAL20	**Sampled by**	Diane Champagne
Purge Start	15:00	**Gallons Purged**	4.26	**Replicate/ Code No.**			

Purge End

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:05	0	0	275	20.9	0.00	6.54	0.576	69.77	0.99	8.6	10.1	Orange	None
15:10	5	5	275	20.91	0.00	6.53	0.576	8.03	0.79	8.7	8.9	Orange	None
15:15	5	10	275	20.91	0.00	6.5	0.574	9.87	0.78	8.5	8.7	Orange	None
15:20	5	15	275	20.91	0.00	6.5	0.573	10.8	0.91	8.5	7.6	Orange	None
15:25	5	20	275	20.91	0.00	6.48	0.575	9.76	1.3	8.1	7.1	Orange	None
15:30	5	25	275	20.91	0.00	6.48	0.572	24.91	1.06	8.5	5	Orange	None
15:36	6	31	275	20.91	0.00	6.5	0.572	26.32	0.82	8.6	2.3	Orange	None
15:40	4	35	275	20.91	0.00	6.5	0.569	24.29	0.71	8.6	0.9	Orange	None
15:45	5	40	275	20.91	0.00	6.5	0.569	24.6	0.55	8.1	-0.2	Orange	None
15:50	5	45	275	20.92	0.00	6.5	0.571	24.42	0.53	8.3	-1.3	Orange	None
15:55	5	50	275	20.92	0.00	6.5	0.572	24.24	0.52	8.2	-2.3	Orange	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Barrier wall

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-99-31A			**Date**	11/02/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	39 °F, Overcast, W winds at 20 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	2.05	**Total Depth (ft-bmp)**	15.65	**Water Column(ft)**	13.6	**Gallons in Well**	2.21
MP Elevation		**Pump Intake (ft-bmp)**	10	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:00	**Volumes Purged**		**Sample ID**	SHM-99--31A-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	10:16	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	11:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:27	0	0	250	2.1	0.00	6.7	0.091	9.8	1.69	8.7	271.4	Clear	None
10:30	3	3	250	2.1	0.00	6.3	0.091	13.8	1.35	8.8	270.6	Clear	None
10:33	3	6	250	2.1	0.00	6.05	0.09	11.5	1.23	8.8	269.6	Clear	None
10:37	4	10	250	2.1	0.00	5.85	0.088	11.7	1.14	8.3	269	Clear	None
10:40	3	13	250	2.1	0.00	5.72	0.089	11.9	1.05	8.6	268.2	Clear	None
10:43	3	16	250	2.1	0.00	5.66	0.087	14.6	1.02	8	266.9	Clear	None
10:46	3	19	250	2.1	0.00	5.61	0.086	14	1	8.1	266.7	Clear	None
10:49	3	22	250	2.1	0.00	5.58	0.086	14.6	0.99	8.2	265.9	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well:

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-3A			**Date**	11/02/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	38 °F, Sunny, W winds at 18 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.5	**Total Depth (ft-bmp)**	27.37	**Water Column(ft)**	14.87	**Gallons in Well**	0.6
MP Elevation		**Pump Intake (ft-bmp)**	24	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:45	**Volumes Purged**		**Sample ID**	SHP-2016-3A-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	14:10	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	15:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:13	0	0	250	13.22	0.00	6.81	0.084	7.1	1.95	7.6	155.7	Clear	None
14:16	3	3	250	13.8	0.00	6.72	0.087	7.8	1.7	7.3	153	Clear	None
14:19	3	6	250	12.74	0.00	6.65	0.091	14.5	1.54	6.8	151.4	Clear	None
14:22	3	9	250	12.74	0.00	6.59	0.096	8.8	1.39	6.6	151.1	Clear	None
14:26	4	13	250	12.74	0.00	6.57	0.097	5.7	1.3	6.6	150.9	Clear	None
14:29	3	16	250	12.74	0.00	6.55	0.097	3.5	1.26	6.6	151.1	Clear	None
14:32	3	19	250	12.74	0.00	6.54	0.097	3	1.21	6.6	150.9	Clear	None
14:35	3	22	250	12.74	0.00	6.53	0.097	3.4	1.17	6.6	150.7	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EPA-PZ-2012-3B			**Date**	11/02/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	39 °F, Sunny, W winds at 11 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.5	**Total Depth (ft-bmp)**	76.8	**Water Column(ft)**	65.3	**Gallons in Well**	2.65
MP Elevation		**Pump Intake (ft-bmp)**	73	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:30	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-3B-FAL2012	**Sampled by**	Connor Rosenbaum
Purge Start	13:03	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	13:40						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:07	0	0	250	11.7	0.00	6.43	0.311	14.3	1.84	10	148.7	Clear	None
13:10	3	3	250	11.7	0.00	6.39	0.313	22.8	1.25	10	141	Clear	None
13:13	3	6	250	11.7	0.00	6.39	0.312	29.2	1.05	9.8	136.9	Clear	None
13:16	3	9	250	11.7	0.00	6.4	0.312	34.3	0.96	9.7	134.1	Clear	None
13:19	3	12	250	11.7	0.00	6.41	0.311	35.3	0.91	9.7	132.4	Clear	None
13:22	3	15	250	11.7	0.00	6.42	0.311	35.5	0.88	9.5	130.9	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EPA-PZ-2012-3A			**Date**	11/02/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	39 °F, Overcast, W winds at 22 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.6	**Total Depth (ft-bmp)**	26.75	**Water Column(ft)**	15.15	**Gallons in Well**	0.62
MP Elevation		**Pump Intake (ft-bmp)**	22	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:45	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-3A-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	11:57	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	12:50						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:01	0	0	250	11.64	0.00	5.73	0.183	96.5	2.8	9.7	245.5	Clear	None
12:04	3	3	250	11.64	0.00	5.72	0.182	100.5	1.92	9.5	241.5	Clear	None
12:07	3	6	250	11.64	0.00	5.7	0.183	56.5	1.98	9.2	237.9	Clear	None
12:10	3	9	250	11.64	0.00	5.7	0.183	43.3	1.4	9	235.4	Clear	None
12:13	3	12	250	11.64	0.00	5.7	0.183	30	1.19	9.5	233.7	Clear	None
12:16	3	15	250	11.64	0.00	5.7	0.185	26.3	1.13	9.2	231.9	Clear	None
12:19	3	18	250	11.64	0.00	5.71	0.187	17.5	1.07	9.6	230.3	Clear	None
12:22	3	21	250	11.64	0.00	5.72	0.19	15.1	1.03	10	228.4	Clear	None
12:25	3	24	250	11.64	0.00	5.73	0.192	8.7	1	10.3	226.5	Clear	None
12:28	3	27	250	11.64	0.00	5.75	0.193	8.2	0.95	10.3	224.4	Clear	None
12:31	3	30	250	11.64	0.00	5.76	0.195	8.4	0.92	10.6	222.8	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHL-7			**Date**	11/03/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	37.9 degrees F and Clear. The wind is blowing W at 41.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	17.6	**Total Depth (ft-bmp)**	22.8	**Water Column(ft)**	5.2	**Gallons in Well**	1.32
MP Elevation		**Pump Intake (ft-bmp)**	20.8	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:10	**Volumes Purged**	2.65	**Sample ID**	SHL-7-FAL20	**Sampled by**	Nicholas Burch
Purge Start	09:10	**Gallons Purged**	3.50	**Replicate/ Code No.**			
Purge End	10:25						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:35	0	0	250	17.6	0.00	6.19	0.181	160	2.8	8.5	106.6	Clear	None
09:40	5	5	250	17.6	0.00	5.96	0.189	50	1.34	8.9	91.1	Clear	None
09:45	5	10	250	17.6	0.00	5.92	0.184	21.5	1	8.9	85.5	Clear	None
09:50	5	15	250	17.6	0.00	5.91	0.181	14.5	0.87	9.1	83.8	Clear	None
09:55	5	20	250	17.6	0.00	5.91	0.179	9.8	0.82	9.1	83.7	Clear	None
09:58	3	23	250	17.6	0.00	5.91	0.178	9.3	0.78	9.3	83.8	Clear	None
10:03	5	28	250	17.6	0.00	5.91	0.175	8.9	0.79	9.1	84.3	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	SHL	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	PZ-12-05			**Date**	11/03/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	39.9 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21.55	**Total Depth (ft-bmp)**	36	**Water Column(ft)**	14.45	**Gallons in Well**	2.35
MP Elevation		**Pump Intake (ft-bmp)**	31	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:55	**Volumes Purged**	3.13	**Sample ID**	PZ-12-05-FAL20	**Sampled by**	Diane Champagne
Purge Start	11:30	**Gallons Purged**	7.34	**Replicate/ Code No.**			

Purge End

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:46	0	0	275	21.55	0.00	6.61	0.288	25.06	2.46	9.5	74.9		
11:50	4	4	350	21.6	0.00	6.64	0.282	23.66	2.4	9.7	56.3		
11:56	6	10	350	21.6	0.00	6.63	0.281	27.8	3.56	9.5	56.7		
12:00	4	14	350	21.6	0.00	6.61	0.28	3.77	3.99	9.3	58.4		
12:15	15	29	350	21.6	0.00	6.56	0.279	3.89	5.62	9.5	56.3		
12:20	5	34	350	21.6	0.00	6.58	0.279	4.22	0.85	9.4	53.8		
12:24	4	38	350	21.6	0.00	6.59	0.276	3.58	0.93	9.6	51.6		
12:30	6	44	350	21.6	0.00	6.58	0.279	3.86	1.03	9.4	49.5		
12:40	10	54	350	21.6	0.00	6.52	0.277	3.41	0.88	9.3	47.8		
12:45	5	59	350	21.6	0.00	6.5	0.277	3.31	0.86	9.5	46		
12:50	5	64	350	21.6	0.00	6.51	0.277	3.37	0.91	9.4	43.8		

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Barrier wall

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	PZ-12-06			**Date**	11/03/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	39.9 degrees F and Mostly Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	24.22	**Total Depth (ft-bmp)**	35	**Water Column(ft)**	10.78	**Gallons in Well**	1.75
MP Elevation		**Pump Intake (ft-bmp)**	30	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:00	**Volumes Purged**	2.53	**Sample ID**	PZ-12-06-FAL20	**Sampled by**	Diane Champagne
Purge Start	13:10	**Gallons Purged**	4.43	**Replicate/ Code No.**			
Purge End	14:07						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:20	0	0	350	24.26	0.00	6.38	0.271	7.1	1.11	10.4	57.7	Orange	None
13:25	5	5	350	24.27	0.00	6.35	0.258	7.14	0.85	10.3	57.8	Orange	None
13:30	5	10	350	24.29	0.00	6.32	0.248	3.22	0.73	10.6	58	Orange	None
13:35	5	15	350	24.34	0.00	6.32	0.247	2.92	0.69	10.5	58	Orange	None
13:41	6	21	350	24.34	0.00	6.29	0.245	3.35	0.65	10.6	58.5	Orange	None
13:46	5	26	350	24.34	0.00	6.27	0.244	3.96	0.61	10.3	58.5	Orange	None
13:50	4	30	350	24.34	0.00	6.24	0.243	3.61	0.61	10.6	59.3	Orange	None
13:55	5	35	350	24.34	0.00	6.24	0.243	3.11	0.6	10.3	58.9	Orange	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2006

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-11-02			**Date**	11/03/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	41.0 degrees F and Mostly Cloudy. The wind is blowing NW at 45.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	Open
Static Water Level (ft-bmp)	23.06	**Total Depth (ft-bmp)**	66	**Water Column(ft)**	42.94	**Gallons in Well**	27.91
MP Elevation		**Pump Intake (ft-bmp)**	60	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:50	**Volumes Purged**	0.08	**Sample ID**	SHM-11-02-FAL20	**Sampled by**	Diane Champagne
Purge Start	14:10	**Gallons Purged**	2.31	**Replicate/ Code No.**			
Purge End	15:04						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:16	0	0	325	23.06	0.00	6.45	0.533	39.96	1.19	10.4	28.8	Black	None
14:20	4	4	200	23.8	0.00	6.53	0.542	16.31	0.81	9.9	15.9	Black	None
14:25	5	9	200	23.88	0.00	6.59	0.535	16.1	0.65	9.3	4.5	Black	None
14:30	5	14	200	23.99	0.00	6.65	0.533	15.21	0.57	9.2	-8.3	Black	None
14:35	5	19	200	24.21	0.00	6.68	0.534	15.2	0.53	9.3	-22.8	Black	None
14:40	5	24	200	24.6	0.00	6.72	0.536	15.56	0.5	9.4	-28.4	Black	None
14:45	5	29	200	24.6	0.00	6.76	0.533	14.86	0.49	9.3	-29.7	Black	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2006

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHL-22			**Date**	11/03/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	40 °F, Sunny, NW winds at 17 mph.			
Measuring Pt. Description	Top of Outer Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.15	**Total Depth (ft-bmp)**	111.2	**Water Column(ft)**	102.05	**Gallons in Well**	66.33
MP Elevation		**Pump Intake (ft-bmp)**	108	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:15	**Volumes Purged**		**Sample ID**	SHL-22-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	12:39	**Gallons Purged**		**Replicate/ Code No.**	SHL-DUP07-FAL20		
Purge End	13:34						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:42	0	0	200	9.3	0.00	7.53	0.301	2.4	5	9.1	58	Clear	None
12:45	3	3	200	9.37	0.00	6.98	0.348	2.4	2.2	9.1	76	Clear	None
12:49	4	7	200	9.37	0.00	6.8	0.353	2.4	1.42	8.9	85.6	Clear	None
12:53	4	11	200	9.37	0.00	6.72	0.352	2.4	1.27	8.6	92.1	Clear	None
12:56	3	14	200	9.45	0.00	6.69	0.35	3.4	1.27	8.7	94.3	Clear	None
12:59	3	17	200	9.5	0.00	6.67	0.352	2.4	1.17	8.7	97.8	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHL-9			**Date**	11/03/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	42 °F, Sunny, NW winds at 14 mph.			
Measuring Pt. Description	Top of Outer Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC,Steel
Static Water Level (ft-bmp)	20.7	**Total Depth (ft-bmp)**	26.8	**Water Column(ft)**	6.1	**Gallons in Well**	3.96
MP Elevation		**Pump Intake (ft-bmp)**	23	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:10	**Volumes Purged**		**Sample ID**	SHL-9-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	14:01	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	15:15						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:32	0	0	200	11.83	0.00	7.36	0.136	75	3.39	8.9	5	Brown	None
14:35	3	3	200	11.83	0.00	7.16	0.146	71.2	2.96	8.8	14.7	Brown	None
14:37	2	5	200	11.83	0.00	6.94	0.157	70.1	2.36	8.7	19.8	Brown	None
14:40	3	8	200	11.83	0.00	6.78	0.172	70	1.72	9	18.3	Brown	None
14:43	3	11	200	11.83	0.00	6.7	0.181	71	1.42	8.9	15.4	Brown	None
14:46	3	14	200	11.83	0.00	6.64	0.185	70	1.17	8.9	12.2	Brown	None
14:49	3	17	200	11.83	0.00	6.6	0.189	70	1.01	8.9	9.9	Brown	None
14:52	3	20	200	11.83	0.00	6.56	0.192	71	0.9	8.9	6.6	Brown	None
14:55	3	23	200	11.83	0.00	6.54	0.193	71.2	0.85	8.8	5.1	Brown	None
14:58	3	26	200	11.83	0.00	6.52	0.194	72.3	0.83	8.7	3.6	Brown	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-93-22C			**Date**	11/03/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	38 °F, Sunny, W winds at 11 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.06	**Total Depth (ft-bmp)**	136.75	**Water Column(ft)**	126.69	**Gallons in Well**	82.34
MP Elevation		**Pump Intake (ft-bmp)**	133	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:45	**Volumes Purged**		**Sample ID**	SHM-93-22C-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	11:26	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	11:51						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:28	0	0	200	10.4	0.00	7.48	0.193	3.3	3.04	9.4	-20	Clear	None
11:31	3	3	200	10.65	0.00	7.49	0.193	3.5	2.58	9.4	-18	Clear	None
11:34	3	6	200	10.89	0.00	7.51	0.193	4.5	2.47	9.3	-15.5	Clear	None
11:37	3	9	200	11.1	0.00	7.52	0.192	4.2	2.46	9.2	-13.9	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-3B			**Date**	11/03/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	38 °F, Sunny, W winds at 13 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.13	**Total Depth (ft-bmp)**	87.42	**Water Column(ft)**	75.29	**Gallons in Well**	3.06
MP Elevation		**Pump Intake (ft-bmp)**	84	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:20	**Volumes Purged**		**Sample ID**	SHP-2016-3B-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	08:36	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	09:33						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:41	0	0	250	12.15	0.00	7.23	0.16	8.5	2.27	7.1	-23.6	Clear	None
08:44	3	3	250	12.15	0.00	6.71	0.156	8.4	1.55	7	-30.4	Clear	None
08:47	3	6	250	12.15	0.00	6.65	0.156	7.9	1.5	7	-31.1	Clear	None
08:53	6	12	250	12.15	0.00	6.42	0.153	8.5	1.23	7	-35	Clear	None
08:56	3	15	250	12.15	0.00	6.36	0.151	9.7	1.13	6.9	-36.7	Clear	None
08:59	3	18	250	12.15	0.00	6.31	0.15	10.5	1.06	7.2	-38.7	Clear	None
09:02	3	21	250	12.15	0.00	6.3	0.15	11.2	1.04	7.2	-40.5	Clear	None
09:06	4	25	250	12.15	0.00	6.3	0.149	11.8	1	7.3	-42.4	Clear	None
09:09	3	28	250	12.15	0.00	6.3	0.151	11.8	1.01	7.3	-43.9	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-93-22B			**Date**	11/03/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	38 °F, Sunny, W winds at 11 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.43	**Total Depth (ft-bmp)**	93.45	**Water Column(ft)**	84.02	**Gallons in Well**	54.61
MP Elevation		**Pump Intake (ft-bmp)**	90	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:50	**Volumes Purged**		**Sample ID**	SHM-93-22B-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	10:17	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	10:58						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:22	0	0	200	9.44	0.00	6.42	0.315	59	1.77	9.1	-10.7	Clear	None
10:26	4	4	200	9.44	0.00	6.41	0.319	44	1.35	9.12	-15.5	Clear	None
10:29	3	7	200	9.44	0.00	6.42	0.321	42.2	1.1	9.1	-19	Clear	None
10:32	3	10	200	9.44	0.00	6.43	0.322	42.2	0.98	9.1	-20.9	Clear	None
10:35	3	13	200	9.44	0.00	6.44	0.322	42	0.92	9.1	-22.9	Clear	None
10:38	3	16	200	9.44	0.00	6.45	0.322	42	0.9	9.1	-24.2	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EPA-PZ-2012-2B			**Date**	11/05/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	66 °F, Sunny, SW winds at 12 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.6	**Total Depth (ft-bmp)**	83.1	**Water Column(ft)**	71.5	**Gallons in Well**	2.9
MP Elevation		**Pump Intake (ft-bmp)**	80	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:50	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-2B-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	12:06	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	13:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:09	0	0	200	11.7	0.00	6.2	0.205	400	2	12.7	98.6	Clear	None
12:11	2	2	200	11.7	0.00	6.14	0.211	420	1.81	12.7	95	Clear	None
12:14	3	5	200	11.7	0.00	5.96	0.254	440	1.22	12.5	80	Clear	None
12:18	4	9	200	11.7	0.00	5.89	0.276	335	1.04	12.6	68	Clear	None
12:21	3	12	200	11.7	0.00	5.88	0.281	200	0.96	12.3	63.4	Clear	None
12:24	3	15	200	11.7	0.00	5.88	0.285	107.6	0.95	12.4	61	Clear	None
12:27	3	18	200	11.7	0.00	5.88	0.285	64.1	0.92	12.2	58.9	Clear	None
12:30	3	21	200	11.7	0.00	5.89	0.287	45	0.89	12.4	56.9	Clear	None
12:33	3	24	200	11.7	0.00	5.9	0.289	30	0.86	12.4	55.5	Clear	None
12:36	3	27	200	11.7	0.00	5.91	0.285	15.9	0.85	12.1	55.1	Clear	None
12:40	4	31	200	11.7	0.00	5.92	0.285	13.1	0.84	12.2	55.3	Clear	None
12:44	4	35	200	11.7	0.00	5.92	0.288	13	0.83	12.3	54.3	Clear	None
12:47	3	38	200	11.7	0.00	5.93	0.288	12.4	0.81	12.4	54.2	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	M15

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EPA-PZ-2012-2A			**Date**	11/05/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	56 °F, Sunny, S winds at 9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.58	**Total Depth (ft-bmp)**	28.17	**Water Column(ft)**	16.59	**Gallons in Well**	0.67
MP Elevation		**Pump Intake (ft-bmp)**	25	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:15	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-2A-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	10:32	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	11:24						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:35	0	0	200	11.7	0.00	7.85	0.048	4.3	5.93	12	221.9	Clear	None
10:38	3	3	200	11.7	0.00	7.46	0.048	2.5	5.93	2.3	228.5	Clear	None
10:41	3	6	200	11.7	0.00	6.86	0.048	1.3	5.91	11.6	237.8	Clear	None
10:44	3	9	200	11.7	0.00	6.49	0.048	1.4	5.9	11.6	244	Clear	None
10:47	3	12	200	11.7	0.00	6.16	0.048	1.3	5.85	11.8	248.9	Clear	None
10:50	3	15	200	11.7	0.00	5.86	0.047	1.2	5.84	11.7	252.4	Clear	None
10:53	3	18	200	11.7	0.00	5.76	0.047	1.2	5.84	11.6	256.1	Clear	None
10:56	3	21	200	11.7	0.00	5.63	0.047	1.4	5.82	11.8	258.3	Clear	None
11:00	4	25	200	11.7	0.00	5.58	0.047	1.7	5.82	12.1	261.3	Clear	None
11:09	9	34	200	11.7	0.00	5.56	0.047	1.3	5.8	12.4	262.4	Clear	None
11:12	3	37	200	11.7	0.00	5.55	0.047	1.9	5.79	12.4	263.7	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: M15

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	PZ-12-08			**Date**	11/05/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	69.1 degrees F and Clear. The wind is blowing SW at 37.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	27.35	**Total Depth (ft-bmp)**	32	**Water Column(ft)**	4.65	**Gallons in Well**	0.76
MP Elevation		**Pump Intake (ft-bmp)**	30	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:30	**Volumes Purged**	3.48	**Sample ID**	PZ-12-08-FAL20	**Sampled by**	Diane Champagne
Purge Start	13:45	**Gallons Purged**	2.64	**Replicate/ Code No.**			
Purge End	14:36						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:50	0	0	225	27.35	0.00	8.4	0.169	152.04	0.81	13.9	64.5	Orange	None
13:55	5	5	225	27.36	0.00	8.11	0.169	198.32	0.56	13.7	75.9	Orange	None
14:00	5	10	225	27.36	0.00	7.87	0.168	145.21	0.48	13.9	82.7	Orange	None
14:05	5	15	225	27.36	0.00	7.78	0.168	125.48	0.46	13.8	84.4	Orange	None
14:10	5	20	225	27.36	0.00	7.69	0.168	67.21	0.45	13.7	87.3	Orange	None
14:15	5	25	225	27.36	0.00	7.54	0.168	32.54	0.44	13.6	91.5	Orange	None
14:20	5	30	225	27.36	0.00	7.55	0.168	30.11	0.43	13.5	89.3	Orange	None
14:25	5	35	225	27.36	0.00	7.49	0.167	29.77	0.42	13.6	89.7	Orange	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	PZ-12-07			**Date**	11/05/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	68.0 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	NA
Static Water Level (ft-bmp)	27.75	**Total Depth (ft-bmp)**	30	**Water Column(ft)**	2.25	**Gallons in Well**	0.37
MP Elevation		**Pump Intake (ft-bmp)**	29	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:20	**Volumes Purged**	8.96	**Sample ID**	PZ-12-07-FAL20	**Sampled by**	Diane Champagne
Purge Start	12:20	**Gallons Purged**	3.32	**Replicate/ Code No.**			
Purge End	13:34						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:30	0	0	210	27.8	0.00	8.57	0.062	288.32	8.31	13.1	61.4	Orange	None
12:35	5	5	210	27.84	0.00	8.41	0.09	334.68	7.55	13	77	Orange	None
12:40	5	10	210	27.86	0.00	8.13	0.165	350.14	6.31	12.9	96.1	Orange	None
12:45	5	15	210	27.86	0.00	7.85	0.211	336.26	5.03	12.7	106.4	Orange	None
12:51	6	21	210	27.86	0.00	7.83	0.231	332.16	4.39	12.7	107.6	Orange	None
12:55	4	25	210	27.86	0.00	7.74	0.233	304.93	4.25	12.8	110.1	Orange	None
13:01	6	31	210	27.87	0.00	7.75	0.235	283.93	4.09	12.8	106.1	Orange	None
13:05	4	35	210	27.83	0.00	7.73	0.239	326.08	4	12.7	104.7	Orange	None
13:10	5	40	210	27.81	0.00	7.68	0.246	321.27	3.91	12.8	103.5	Orange	None
13:15	5	45	210	27.81	0.00	7.69	0.241	330.66	3.85	12.9	100.4	Orange	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-1A			**Date**	11/05/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	69.1 degrees F and Clear. The wind is blowing SW at 49.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	16.81	**Total Depth (ft-bmp)**	23	**Water Column(ft)**	6.19	**Gallons in Well**	0.25
MP Elevation		**Pump Intake (ft-bmp)**	20	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:40	**Volumes Purged**	10.99	**Sample ID**	SHP-2016-01A-FAL20	**Sampled by**	Diane Champagne
Purge Start	15:00	**Gallons Purged**	2.75	**Replicate/ Code No.**			
Purge End	15:42						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:05	0	0	280	16.81	0.00	7.99	0.044	8.6	4.13	13.4	80.2	Grayish Brown	Mild
15:10	5	5	280	16.83	0.00	7.88	0.044	28.16	3.57	13.1	88.1	Grayish Brown	Mild
15:15	5	10	280	16.84	0.00	7.81	0.044	22.19	3.51	13.1	91.7	Grayish Brown	Mild
15:20	5	15	280	16.84	0.00	7.74	0.045	8.44	3.43	13.1	95.1	Grayish Brown	Mild
15:25	5	20	280	16.84	0.00	7.69	0.045	8.76	3.47	12.9	98.1	Grayish Brown	Mild
15:31	6	26	280	16.84	0.00	7.64	0.045	8.81	3.51	12.9	100.9	Grayish Brown	Mild
15:35	4	30	280	16.84	0.00	7.64	0.045	8.48	3.52	12.9	101.3	Grayish Brown	Mild

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Near treatment building, on grass	Well Locked at Arrival:	no
Condition of Well:	Missing lock	Well Locked at Departure:	no
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-13-02			**Date**	11/05/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	70 °F, Sunny, SW winds at 12 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.04	**Total Depth (ft-bmp)**	72.85	**Water Column(ft)**	59.81	**Gallons in Well**	9.72
MP Elevation		**Pump Intake (ft-bmp)**	69	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:00	**Volumes Purged**		**Sample ID**	SHM-13-02-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	14:18	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	15:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:22	0	0	200	13.06	0.00	6.76	0.245	30.1	3.13	12.7	121.4	Clear	None
14:25	3	3	200	13.06	0.00	6.4	0.244	21.4	2.39	13.4	133.8	Clear	None
14:28	3	6	200	13.06	0.00	6.24	0.243	16.5	2.2	13.5	143.2	Clear	None
14:32	4	10	200	13.06	0.00	6.17	0.241	12.3	2.13	13.2	150.6	Clear	None
14:36	4	14	200	13.06	0.00	6.14	0.244	10	2.08	13.6	155.8	Clear	None
14:41	5	19	200	13.06	0.00	6.13	0.244	9.3	2.05	13.6	161.2	Clear	None
14:45	4	23	200	13.06	0.00	6.13	0.245	9.4	2.04	13.5	164.6	Clear	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	M1

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-13-07			**Date**	11/05/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	70 °F, Sunny, SW winds at 11 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	19.15	**Total Depth (ft-bmp)**	35	**Water Column(ft)**	15.85	**Gallons in Well**	2.58
MP Elevation		**Pump Intake (ft-bmp)**	32	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	16:00	**Volumes Purged**		**Sample ID**	SHM-13-07-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	15:28	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	16:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:33	0	0	200	19.15	0.00	6.39	0.496	220	1.27	14.7	-9.3	Clear	None
15:38	5	5	200	19.15	0.00	6.36	0.506	148.1	1.02	14.7	-16.1	Clear	None
15:41	3	8	200	19.15	0.00	6.34	0.504	111.2	0.96	14.6	-17.3	Clear	None
15:44	3	11	200	19.15	0.00	6.33	0.509	100	0.92	14.7	-19.2	Clear	None
15:47	3	14	200	19.15	0.00	6.33	0.504	77.3	0.89	14.7	-22.7	Clear	None
15:50	3	17	200	19.15	0.00	6.34	0.501	77.2	0.86	14.6	-24.8	Clear	None
15:53	3	20	200	19.15	0.00	6.35	0.498	77.3	0.85	14.6	-26.3	Clear	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Right side of rock driveway, next to bushes, parallel with electric meter on house	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-1B			**Date**	11/05/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	69.1 degrees F and Clear. The wind is blowing S at 29.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	18	**Total Depth (ft-bmp)**	85	**Water Column(ft)**	67	**Gallons in Well**	2.72
MP Elevation		**Pump Intake (ft-bmp)**	80	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	16:30	**Volumes Purged**	0.85	**Sample ID**	SHP-2016-1B-FAL20	**Sampled by**	Diane Champagne
Purge Start	15:45	**Gallons Purged**	2.30	**Replicate/ Code No.**			
Purge End	16:39						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:50	0	0	280	18.21	0.00	7.58	0.129	7.97	1.43	12.4	79.7	Grayish Brown	None
15:55	5	5	180	18.41	0.00	7.49	0.176	6.89	0.44	12.6	67.8	Grayish Brown	None
16:00	5	10	180	18.44	0.00	7.46	0.191	7.67	0.38	12.4	61.6	Grayish Brown	None
16:06	6	16	180	18.44	0.00	7.47	0.191	7.87	0.33	0.34	55.6	Grayish Brown	None
16:10	4	20	180	18.44	0.00	7.47	0.193	7.18	0.32	12.3	51.9	Grayish Brown	None
16:16	6	26	180	18.44	0.00	7.46	0.202	7.17	0.31	12.3	47.5	Grayish Brown	None
16:20	4	30	180	18.44	0.00	7.46	0.206	7.15	0.3	12.5	46.2	Grayish Brown	None
16:25	5	35	180	18.44	0.00	7.46	0.207	6.62	0.3	12.5	45.5	Grayish Brown	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Grassy area near treatment building	Well Locked at Arrival:	no
Condition of Well:	Good condition,Missing lock	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-13-05			**Date**	11/06/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	53.1 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	16.9	**Total Depth (ft-bmp)**	87.3	**Water Column(ft)**	70.4	**Gallons in Well**	17.87
MP Elevation		**Pump Intake (ft-bmp)**	84.3	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:00	**Volumes Purged**	0.12	**Sample ID**	SHM-13-05-FAL20	**Sampled by**	Nicholas Burch
Purge Start	08:27	**Gallons Purged**	2.18	**Replicate/ Code No.**			
Purge End	09:15						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:40	0	0	250	16.9	0.00	7.11	0.255	3.5	3.45	12.9	197	Clear	None
08:45	5	5	250	16.9	0.00	6.68	0.165	3.5	1.67	12.4	204.6	Clear	None
08:48	3	8	250	17	0.00	6.45	0.145	3.7	1.25	12.3	209.1	Clear	None
08:51	3	11	250	17	0.00	6.28	0.135	3.8	1.32	12.3	214.2	Clear	None
08:54	3	14	250	17	0.00	6.18	0.134	4.1	1.21	12.4	216.2	Clear	None
08:57	3	17	250	17	0.00	6.14	0.134	4.3	1.16	12.4	216.9	Clear	None
09:00	3	20	250	17	0.00	6.13	0.134	3.7	1.15	12.4	216.8	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	SHL	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-13-04			**Date**	11/06/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	60.1 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	20.55	**Total Depth (ft-bmp)**	25.3	**Water Column(ft)**	4.75	**Gallons in Well**	0.77
MP Elevation		**Pump Intake (ft-bmp)**	23.3	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:10	**Volumes Purged**	3.00	**Sample ID**	SHM-13-04-FAL20	**Sampled by**	Nicholas Burch
Purge Start	09:35	**Gallons Purged**	2.31	**Replicate/ Code No.**			
Purge End	11:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:45	0	0	250	20.55	0.00	6.3	0.3	223	4.4	14.5	239.6	Clear	None
09:50	5	5	250	20.55	0.00	6.18	0.297	198	3.19	14.5	243.1	Clear	None
09:55	5	10	250	20.55	0.00	6.17	0.298	188	3.09	14.5	243	Clear	None
09:58	3	13	250	20.55	0.00	6.17	0.299	162	3.13	14.6	241.9	Clear	None
10:01	3	16	250	20.55	0.00	6.18	0.299	154	3.06	14.7	241.3	Clear	None
10:04	3	19	250	20.55	0.00	6.17	0.295	128	2.8	14.7	239.9	Clear	None
10:07	3	22	250	20.55	0.00	6.17	0.294	128	2.77	14.8	239.9	Clear	None
10:10	3	25	250	20.55	0.00	6.17	0.29	128	2.89	14.7	239	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	SHM	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-4B			**Date**	11/06/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	55 °F, Sunny, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	19.8	**Total Depth (ft-bmp)**	32.61	**Water Column(ft)**	12.81	**Gallons in Well**	0.52
MP Elevation		**Pump Intake (ft-bmp)**	29	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:20	**Volumes Purged**		**Sample ID**	SHP-2016-4B-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	10:52	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	11:30						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:52	0	0	200	19.8	0.00	6.55	0.045	14	4.51	11.3	111.2	Clear	None
10:55	3	3	200	19.8	0.00	6.45	0.042	18.5	4.25	10.4	119.5	Clear	None
10:58	3	6	200	19.8	0.00	9.37	0.041	30.8	3.9	10.2	127.8	Clear	None
11:01	3	9	200	19.8	0.00	6.32	0.041	21.8	4.03	10.5	131.1	Clear	None
11:04	3	12	200	19.8	0.00	6.28	0.041	12.2	4.05	10.1	133.7	Clear	None
11:07	3	15	200	19.8	0.00	6.24	0.04	9	4.01	10.3	138	Clear	None
11:10	3	18	200	19.8	0.00	6.22	0.04	7.4	3.96	10.2	141.1	Clear	None
11:13	3	21	200	19.8	0.00	6.21	0.04	7.2	4.2	10	145.2	Clear	None
11:16	3	24	200	19.8	0.00	6.19	0.04	7.2	4.27	10.3	148.4	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-4A			**Date**	11/06/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	55 °F, Sunny, S winds at 4 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	19.18	**Total Depth (ft-bmp)**	92.45	**Water Column(ft)**	73.27	**Gallons in Well**	2.98
MP Elevation		**Pump Intake (ft-bmp)**	89	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:00	**Volumes Purged**		**Sample ID**	SHP-2016-4A-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	09:21	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	10:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:21	0	0	200	19.2	0.00	6.97	0.221	80	1.8	9.9	-51.2	Clear	None
09:24	3	3	200	19.2	0.00	6.73	0.244	49.9	1.4	10	-55.2	Clear	None
09:27	3	6	200	19.2	0.00	6.58	0.264	41.3	1.2	10	-58.7	Clear	None
09:30	3	9	200	19.2	0.00	6.47	0.285	28.3	1.06	9.9	-61.5	Clear	None
09:33	3	12	200	19.2	0.00	6.42	0.295	19.8	1	10	-63.4	Clear	None
09:35	2	14	200	19.2	0.00	6.41	0.3	14.3	0.97	10	-64.7	Clear	None
09:38	3	17	200	19.2	0.00	6.4	0.303	12.4	0.95	10	-65.9	Clear	None
09:41	3	20	200	19.2	0.00	6.41	0.302	10.1	0.92	10	-67	Clear	None
09:44	3	23	200	19.2	0.00	6.42	0.302	7.5	0.91	10	-68	Clear	None
09:48	4	27	200	19.2	0.00	6.43	0.303	6.5	0.88	10	-69.1	Clear	None
09:51	3	30	200	19.2	0.00	6.43	0.305	6.5	0.87	10.1	-69.6	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-2A			**Date**	11/06/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	68.0 degrees F and Clear. The wind is blowing SW at 25.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	15.26	**Total Depth (ft-bmp)**	27.25	**Water Column(ft)**	11.99	**Gallons in Well**	0.49
MP Elevation		**Pump Intake (ft-bmp)**	24	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:30	**Volumes Purged**		**Sample ID**	SHP-2016-2A-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	11:55	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	12:35						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:58	0	0	200	15.4	0.00	7.59	0.085	29	3.78	12	42.5	Clear	None
12:01	3	3	200	15.4	0.00	7.84	0.084	16.2	2.85	11.7	26.5	Clear	None
12:04	3	6	200	15.4	0.00	8.2	0.083	8.6	2.84	11.4	15.6	Clear	None
12:07	3	9	200	15.4	0.00	8.43	0.082	7.7	2.49	11.3	10.4	Clear	None
12:10	3	12	200	15.4	0.00	8.58	0.081	6.5	2.54	11.3	8.2	Clear	None
12:13	3	15	200	15.4	0.00	8.64	0.081	5.6	2.62	11.5	7.4	Clear	None
12:16	3	18	200	15.4	0.00	8.71	0.08	4.9	2.74	11.5	7.1	Clear	None
12:20	4	22	200	15.4	0.00	8.74	0.081	5	2.87	11.6	7.2	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-2B			**Date**	11/06/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	70.0 degrees F and Clear. The wind is blowing S/SW at 25.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	15.31	**Total Depth (ft-bmp)**	87.71	**Water Column(ft)**	72.4	**Gallons in Well**	2.94
MP Elevation		**Pump Intake (ft-bmp)**	84	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:00	**Volumes Purged**		**Sample ID**	SHP-2016-2B-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	13:29	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	14:13						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:31	0	0	200	15.35	0.00	6.93	0.264	40	1.2	10.5	-72.9	Clear	None
13:34	3	3	200	15.35	0.00	6.76	0.268	25.3	1.01	10.5	-74.4	Clear	None
13:37	3	6	200	15.35	0.00	6.61	0.27	9.1	0.88	10.4	-76.2	Clear	None
13:40	3	9	200	15.35	0.00	6.56	0.272	5.5	0.83	10.6	-76.9	Clear	None
13:43	3	12	200	15.35	0.00	6.53	0.27	4.5	0.81	10.4	-77.5	Clear	None
13:46	3	15	200	15.35	0.00	6.51	0.269	4.6	0.78	10.4	-78.2	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EPA-PZ-2012-7A			**Date**	11/06/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	53.1 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	23.6	**Total Depth (ft-bmp)**	28.87	**Water Column(ft)**	5.27	**Gallons in Well**	0.21
MP Elevation		**Pump Intake (ft-bmp)**	26	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:45	**Volumes Purged**	8.05	**Sample ID**	EPA-PZ-2012-07A-FAL20	**Sampled by**	Diane Champagne
Purge Start	09:10	**Gallons Purged**	1.69	**Replicate/ Code No.**			
Purge End	10:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:15	0	0	180	23.6	0.00	8.36	0.366	9.23	5.25	12.2	106	Clear	None
09:22	7	7	180	23.6	0.00	8.2	0.371	3.83	5.18	12.2	113.2	Clear	None
09:25	3	10	180	23.6	0.00	8.13	0.374	3.61	5.09	12.4	116.1	Clear	None
09:30	5	15	180	23.6	0.00	8.04	0.379	2.61	5.04	12.5	119.8	Clear	None
09:35	5	20	180	23.6	0.00	8.02	0.383	3.06	4.98	12.6	120.7	Clear	None
09:40	5	25	180	23.6	0.00	7.97	0.375	3.24	4.94	12.7	122.7	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Sculley st	Well Locked at Arrival:	no
Condition of Well:	Good condition	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EPA-PZ-2012-7B			**Date**	11/06/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	60.1 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	23.4	**Total Depth (ft-bmp)**	63.82	**Water Column(ft)**	40.42	**Gallons in Well**	1.64
MP Elevation		**Pump Intake (ft-bmp)**	61	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:50	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-7B-FAL20	**Sampled by**	Diane Champagne
Purge Start	10:05	**Gallons Purged**	0.00	**Replicate/ Code No.**			

Purge End

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:06	0	0	320	23.4	0.00	8.55	0.147	6.53	2.02	12.2	8.4	Clear	None
10:11	5	5	300	23.41	0.00	8.44	0.154	3.06	0.8	12	78.3	Clear	None
10:15	4	9	300	23.42	0.00	8.4	0.154	3.77	0.64	12.2	73.4	Clear	None
10:21	6	15	300	23.42	0.00	8.37	0.152	3.32	0.57	12.2	64.3	Clear	None
10:25	4	19	300	23.43	0.00	8.32	0.149	3.54	0.54	12.4	60.9	Clear	None
10:30	5	24	300	23.43	0.00	8.29	0.148	3.83	0.52	12.3	53.4	Clear	None
10:36	6	30	300	23.42	0.00	8.21	0.147	3.11	0.49	12.3	45.3	Clear	None
10:40	4	34	300	23.42	0.00	8.16	0.146	2.92	0.48	12.6	42.5	Clear	None
10:45	5	39	300	23.42	0.00	8.12	0.145	3.48	0.46	12.6	44.4	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Sculley st	Well Locked at Arrival:	no
Condition of Well:	Good condition	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-05-41C			**Date**	11/06/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	64.0 degrees F and Clear. The wind is blowing undefined at 20.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12	**Total Depth (ft-bmp)**	93	**Water Column(ft)**	81	**Gallons in Well**	13.16
MP Elevation		**Pump Intake (ft-bmp)**	90	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:10	**Volumes Purged**	0.39	**Sample ID**	SHM-05-41C-FAL20	**Sampled by**	Diane Champagne
Purge Start		**Gallons Purged**	5.12	**Replicate/ Code No.**			
Purge End	12:36						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:16	0	0	300	12	0.00	7	3.285	9.5	1.08	11.2	76.2	Yellow	None
11:20	4	4	375	12.33	0.00	7.14	2.955	11.01	0.74	11.6	57.8	Yellow	None
11:25	5	9	375	12.33	0.00	7.26	2.701	10.1	0.55	11.8	40	Yellow	None
11:29	4	13	375	12.33	0.00	7.33	2.519	3.37	0.5	11.8	30.6	Yellow	None
11:36	7	20	375	12.34	0.00	7.42	2.228	3.41	0.46	12.2	14.1	Yellow	None
11:40	4	24	375	12.34	0.00	7.48	2.075	2.75	0.45	12.3	6.9	Yellow	None
11:46	6	30	375	12.34	0.00	7.49	1.989	3.03	0.47	12.6	0.3	Yellow	None
11:51	5	35	375	12.34	0.00	7.52	1.95	2.99	0.52	12.9	-5	Yellow	None
11:56	5	40	375	12.34	0.00	7.55	1.985	2.88	0.53	13.3	-10.8	Yellow	None
12:00	4	44	375	12.34	0.00	7.57	1.944	2.95	0.54	13.7	-15.2	Yellow	None
12:05	5	49	375	12.34	0.00	7.58	1.935	3.34	0.54	13.6	-19.9	Yellow	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Sculley st

Well Locked at Arrival: no

Condition of Well: Needs repairs

Well Locked at Departure: no

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Flush mount

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-05-41A			**Date**	11/06/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	70.0 degrees F and Clear. The wind is blowing S/SW at 25.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.96	**Total Depth (ft-bmp)**	44	**Water Column(ft)**	32.04	**Gallons in Well**	5.21
MP Elevation		**Pump Intake (ft-bmp)**	60	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:50	**Volumes Purged**	0.99	**Sample ID**	SHM-05-41A-FAL20	**Sampled by**	
Purge Start	12:50	**Gallons Purged**	5.15	**Replicate/ Code No.**			
Purge End	13:56						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:57	0	0	330	11.96	0.00	8.88	0.108	8.05	0.61	11.5	-15.8	Orange	None
13:02	5	5	330	11.96	0.00	8.72	0.104	11.19	0.47	11.4	-5.9	Orange	None
13:05	3	8	330	11.96	0.00	8.63	0.104	10.78	0.44	11.3	-0.8	Orange	None
13:10	5	13	330	11.96	0.00	8.56	0.103	4.83	0.41	11.3	3.3	Orange	None
13:15	5	18	330	11.96	0.00	8.46	0.104	7.3	0.38	11.7	8.3	Orange	None
13:20	5	23	330	11.96	0.00	8.4	0.104	7.91	0.36	11.5	10.8	Orange	None
13:25	5	28	330	11.96	0.00	8.34	0.104	7.33	0.34	11.8	13.1	Orange	None
13:30	5	33	330	11.96	0.00	8.21	0.104	7.64	0.32	11.8	17.8	Orange	None
13:35	5	38	330	11.96	0.00	8.21	0.104	6.83	0.32	11.9	18	Orange	None
13:40	5	43	330	11.96	0.00	8.21	0.104	6.38	0.32	11.9	18.1	Orange	None
13:46	6	49	330	11.96	0.00	8.17	0.104	6.25	0.32	11.8	19.8	Orange	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Sculley st

Well Locked at Arrival: no

Condition of Well: Good condition,Missing bolts,Needs repairs

Well Locked at Departure: no

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Flush mount

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-05-41B			**Date**	11/06/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	72.0 degrees F and Clear. The wind is blowing W/SW at 41.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.81	**Total Depth (ft-bmp)**	64	**Water Column(ft)**	52.19	**Gallons in Well**	8.48
MP Elevation		**Pump Intake (ft-bmp)**	61	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:55	**Volumes Purged**	0.58	**Sample ID**	SHM-05-41B-FAL20	**Sampled by**	
Purge Start	14:00	**Gallons Purged**	4.89	**Replicate/ Code No.**			
Purge End	15:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:10	0	0	350	11.81	0.00	7.5	0.807	17.8	0.64	11.4	37.9	Orange	None
14:15	5	5	350	11.81	0.00	7.59	0.617	17.52	0.57	11.4	29.3	Orange	None
14:20	5	10	350	11.81	0.00	7.62	0.538	12.12	0.54	11.5	24.4	Orange	None
14:25	5	15	350	11.81	0.00	7.61	0.518	12.01	0.53	11.3	22.3	Orange	None
14:30	5	20	350	11.81	0.00	7.68	0.431	6.3	0.5	11.3	14.7	Orange	None
14:35	5	25	350	11.81	0.00	7.68	0.425	5.73	0.5	11.3	14.2	Orange	None
14:42	7	32	350	11.81	0.00	7.64	0.422	5.95	0.48	11.3	12.4	Orange	None
14:46	4	36	350	11.81	0.00	7.65	0.428	5.55	0.48	11.3	10.4	Orange	None
14:50	4	40	350	11.81	0.00	7.67	0.423	5.51	0.46	11.4	7.9	Orange	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Sculley st	Well Locked at Arrival:	no
Condition of Well:	Needs repairs	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-5A			**Date**	11/09/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	43.0 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	16.37	**Total Depth (ft-bmp)**	32.92	**Water Column(ft)**	16.55	**Gallons in Well**	0.67
MP Elevation		**Pump Intake (ft-bmp)**	29	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:00	**Volumes Purged**		**Sample ID**	SHP-2016-5A-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	09:10	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	10:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:18	0	0	200	16.46	0.00	7.47	0.153	17.6	1.85	10.9	14.7	Clear	None
09:21	3	3	200	16.45	0.00	7.23	0.153	15.6	1738	10.8	12.8	Clear	None
09:24	3	6	200	16.45	0.00	6.85	0.154	14	0.96	10.9	7.1	Clear	None
09:28	4	10	200	16.45	0.00	6.67	0.154	15.1	0.87	11	4	Clear	None
09:31	3	13	200	16.45	0.00	6.58	0.155	35.2	0.82	11	2.1	Clear	None
09:34	3	16	200	16.45	0.00	6.5	0.155	38.5	0.79	11.1	0.3	Clear	None
09:38	4	20	200	16.45	0.00	6.44	0.156	3.41	0.76	11	-1.9	Clear	None
09:41	3	23	200	16.45	0.00	6.42	0.156	2.84	0.74	11.1	-3.2	Clear	None
09:45	4	27	200	16.45	0.00	6.4	0.157	2.79	0.72	11.2	-5.1	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-5B			**Date**	11/09/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	54.0 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	16.36	**Total Depth (ft-bmp)**	92.45	**Water Column(ft)**	76.09	**Gallons in Well**	3.09
MP Elevation		**Pump Intake (ft-bmp)**	70	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:10	**Volumes Purged**		**Sample ID**	SHP-2016-5B-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	10:23	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	11:15						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:28	0	0	200	16.36	0.00	6.48	0.335	6.2	1.09	12.9	-78.9	Clear	None
10:34	6	6	200	16.36	0.00	6.48	0.334	6	1.06	12.8	-79.2	Clear	None
10:37	3	9	200	16.36	0.00	6.49	0.33	7.2	0.97	12.7	-80.5	Clear	None
10:41	4	13	200	16.36	0.00	6.5	0.331	9.2	0.91	12.7	-81.6	Clear	None
10:44	3	16	200	16.42	0.00	6.52	0.33	11.9	0.87	12.8	-82.9	Clear	None
10:47	3	19	200	16.42	0.00	6.53	0.329	5	0.84	12.7	-83.9	Clear	None
10:50	3	22	200	16.42	0.00	6.54	0.33	2.4	0.81	12.8	-85.2	Clear	None
10:55	5	27	200	16.42	0.00	6.55	0.334	2.1	0.79	12.8	-86.3	Clear	None
10:58	3	30	200	16.42	0.00	6.56	0.339	2.1	0.76	12.8	-87.7	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-13-01			**Date**	11/09/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	54.0 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	3.41	**Total Depth (ft-bmp)**	52.31	**Water Column(ft)**	48.9	**Gallons in Well**	7.95
MP Elevation		**Pump Intake (ft-bmp)**	45	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	11:05	**Volumes Purged**	0.14	**Sample ID**	SHM-13-01-FAL20	**Sampled by**	Desmond Bedard
Purge Start	10:25	**Gallons Purged**	1.14	**Replicate/ Code No.**			
Purge End	11:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:30	0	0	140	3.42	0.18	6.42	4.639	3.61	4.94	11.5	154.2	Clear	None
10:35	5	5	120	3.42	0.34	6.01	4.756	3.62	4.35	11.7	213.9	Clear	None
10:40	5	10	100	3.42	0.48	5.76	4.714	3.13	4.39	11.7	215.9	Clear	None
10:45	5	15	100	3.42	0.61	5.71	4.726	2.81	4.29	11.7	223.2	Clear	None
10:50	5	20	100	3.42	0.74	5.7	4.726	3.01	4.26	11.8	227.3	Clear	None
10:55	5	25	100	3.42	0.87	5.69	4.689	2.95	4.26	11.8	230.1	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Organic Carbon	250 mL Amber	1	H2SO4
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride, Sulfate	125 mL Plastic	1	None

Comments: Initial purge appearance - clear; initial purge odor - none

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-05-42A			**Date**	11/09/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	32.0 degrees F and Clear. The wind is blowing W/NW at 29.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.93	**Total Depth (ft-bmp)**	44.27	**Water Column(ft)**	38.34	**Gallons in Well**	1.56
MP Elevation		**Pump Intake (ft-bmp)**	41	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:10	**Volumes Purged**		**Sample ID**	SHM-05-42A-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	12:26	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	13:15						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:26	0	0	200	5.98	0.00	7.2	0.061	4.1	3	13.3	130	Clear	None
12:30	4	4	200	5.98	0.00	6.35	0.058	5.8	1.26	12.6	147.9	Clear	None
12:34	4	8	200	5.98	0.00	5.96	0.057	12.1	0.97	12.6	159.5	Clear	None
12:38	4	12	200	5.98	0.00	5.8	0.057	25.7	0.87	12.2	167	Clear	None
12:42	4	16	200	5.98	0.00	5.68	0.064	40.3	0.79	12.3	171.6	Clear	None
12:45	3	19	200	5.98	0.00	5.65	0.067	29.4	0.75	12.2	172	Clear	None
12:48	3	22	200	5.98	0.00	5.64	0.067	22.9	0.73	12.4	172.6	Clear	None
12:51	3	25	200	5.98	0.00	5.64	0.067	15.6	0.7	12.3	173.1	Clear	None
12:54	3	28	200	5.98	0.00	5.64	0.067	15.5	0.69	12.1	174	Clear	None
12:57	3	31	200	5.98	0.00	5.63	0.067	15.6	0.68	12.2	175.7	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	no
Condition of Well:	Good condition	Well Locked at Departure:	no
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-10-10			**Date**	11/09/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	73.9 degrees F and Clear. The wind is blowing W/NW at 29.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.06	**Total Depth (ft-bmp)**	67.31	**Water Column(ft)**	56.25	**Gallons in Well**	5.14
MP Elevation		**Pump Intake (ft-bmp)**	62.31	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:10	**Volumes Purged**	0.22	**Sample ID**	SHM-10-10-FAL20	**Sampled by**	Desmond Bedard
Purge Start	12:27	**Gallons Purged**	1.14	**Replicate/ Code No.**			
Purge End	13:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:35	0	0	100	11.07	0.21	6.32	4.698	2.78	0.84	16.8	239.1	Clear	None
12:40	5	5	100	11.08	0.34	6.33	4.828	2.79	0.49	16.9	233.8	Clear	None
12:45	5	10	100	11.08	0.48	6.33	4.922	2.79	0.4	16.8	229.7	Clear	None
12:50	5	15	100	11.08	0.61	6.33	5.017	2.52	0.35	16.9	223.7	Clear	None
12:55	5	20	100	11.08	0.74	6.33	5.051	2.52	0.32	16.8	219.8	Clear	None
13:00	5	25	100	11.08	0.87	6.33	5.087	2.55	0.32	16.9	215.7	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments: Lock cut off during gauging event on 11/04/2020 - needs replacement.

Initial purge appearance - clear; initial purge odor - none.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition,Missing lock

Well Completion: Stick-up

Well Locked at Arrival:

Well Locked at Departure:

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-05-42B			**Date**	11/09/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	75.9 degrees F and Clear. The wind is blowing W/NW at 29.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6	**Total Depth (ft-bmp)**	73.38	**Water Column(ft)**	67.38	**Gallons in Well**	2.74
MP Elevation		**Pump Intake (ft-bmp)**	70	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:15	**Volumes Purged**		**Sample ID**	SHM-05-42B-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	13:42	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	14:30						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:43	0	0	200	6.05	0.00	6.82	0.145	8.8	5.8	14.4	23.5	Clear	None
13:46	3	3	200	6.05	0.00	6.32	0.228	28.5	1.44	12.9	-15.8	Clear	None
13:51	5	8	200	6.05	0.00	6.28	0.248	23.8	0.99	12.5	-19.5	Clear	None
13:54	3	11	200	6.05	0.00	6.23	0.271	10.6	0.86	12.5	-2.04	Clear	None
13:57	3	14	200	6.05	0.00	6.22	0.281	8.2	0.82	12.3	-20.9	Clear	None
14:01	4	18	200	6.05	0.00	6.21	0.293	6.2	0.77	12.3	-22.3	Clear	None
14:05	4	22	200	6.05	0.00	6.21	0.295	6.1	0.74	12.1	-23.8	Clear	None
14:08	3	25	200	6.05	0.00	6.22	0.296	6.3	0.72	12.1	-24.5	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	no
Condition of Well:	Good condition	Well Locked at Departure:	no
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-13-06			**Date**	11/09/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	75.9 degrees F and Clear. The wind is blowing W/NW at 29.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	17.72	**Total Depth (ft-bmp)**	45.53	**Water Column(ft)**	27.81	**Gallons in Well**	4.52
MP Elevation		**Pump Intake (ft-bmp)**	40.77	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:20	**Volumes Purged**	0.43	**Sample ID**	SHM-13-06-FAL20	**Sampled by**	Desmond Bedard
Purge Start	13:58	**Gallons Purged**	1.95	**Replicate/ Code No.**			
Purge End	15:20						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:05	0	0	90	17.75	0.17	6.64	4.811	35.32	0.8	16.7	-3.2	Clear	None
14:10	5	5	90	17.75	0.29	6.73	4.896	22.63	0.34	16.8	-46.2	Clear	None
14:15	5	10	90	17.75	0.40	6.8	4.922	19.27	0.19	16.9	-74.5	Clear	None
14:20	5	15	90	17.75	0.52	6.83	4.903	31.03	0.14	16.8	-88.7	Clear	None
14:25	5	20	90	17.75	0.64	6.84	4.88	29.73	0.13	16.7	-96.9	Clear	None
14:30	5	25	90	17.75	0.76	6.85	4.916	24.97	0.1	16.8	-104.5	Clear	None
14:35	5	30	90	17.75	0.87	6.83	4.951	25.39	0.08	16.6	-110.1	Clear	None
14:40	5	35	90	17.75	1.00	6.83	4.973	20.21	0.08	16.3	-115.7	Clear	None
14:45	5	40	90	17.75	1.12	6.84	4.952	20.18	0.07	16	-119.4	Clear	None
14:50	5	45	90	17.75	1.24	6.85	4.992	19.85	0.06	16.1	-122.7	Clear	None
14:55	5	50	90	17.75	1.36	6.85	4.994	18.63	0.06	16.2	-125.9	Clear	None
15:00	5	55	90	17.75	1.47	6.86	5.001	15.62	0.06	16.2	-129.2	Clear	None
15:05	5	60	90	17.75	1.59	6.86	5.002	14.61	0.06	16.2	-129.8	Clear	None
15:10	5	65	90	17.75	1.71	6.86	4.999	14.23	0.06	16.1	-131.4	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments: Initial purge appearance - mostly clear with slight grey haze; initial purge odor - none

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Information

Well Location:		Well Locked at Arrival:	
Condition of Well:	Good condition	Well Locked at Departure:	
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHL-5			**Date**	11/09/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	75.9 degrees F and Clear. The wind is blowing W/NW at 29.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.35	**Total Depth (ft-bmp)**	13.75	**Water Column(ft)**	7.4	**Gallons in Well**	1.2
MP Elevation		**Pump Intake (ft-bmp)**	10	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:45	**Volumes Purged**		**Sample ID**	SHL-5-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	15:04	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	16:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:08	0	0	200	6.6	0.00	6.55	0.081	11.7	1.77	15.3	75.4	Clear	None
15:11	3	3	200	6.65	0.00	6.16	0.079	21.5	1.1	15.1	82	Clear	None
15:16	5	8	200	6.65	0.00	5.93	0.077	43.5	0.84	14.8	92.9	Clear	None
15:20	4	12	200	6.65	0.00	5.82	0.078	22	0.85	14.8	99	Clear	None
15:24	4	16	200	6.65	0.00	5.79	0.078	24.3	0.85	14.6	97.7	Clear	None
15:30	6	22	200	6.7	0.00	5.77	0.08	30.9	0.84	15.3	97.9	Clear	None
15:34	4	26	200	6.7	0.00	5.78	0.08	32.1	0.84	15.3	95.5	Clear	None
15:37	3	29	200	6.7	0.00	5.77	0.081	33.1	0.85	15.1	92.8	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHL-10			**Date**	11/09/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	31.2	**Total Depth (ft-bmp)**	38.5	**Water Column(ft)**	7.3	**Gallons in Well**	1.19
MP Elevation		**Pump Intake (ft-bmp)**	35	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:00	**Volumes Purged**	2.82	**Sample ID**	SHL-10-FAL20	**Sampled by**	Diane Champagne
Purge Start	10:50	**Gallons Purged**	3.36	**Replicate/ Code No.**			
Purge End	12:13						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:00	0	0	180	31.2	0.00	9.18	0.109	30.85	3.77	15.9	82.6	Clear	None
11:05	5	5	180	31.2	0.00	8.91	0.064	33.41	2.77	15.8	94.2	Clear	None
11:10	5	10	180	31.21	0.00	8.88	0.051	34.82	2.4	15.8	99.6	Clear	None
11:15	5	15	180	31.22	0.00	8.83	0.048	35.44	2.31	15.8	101.5	Clear	None
11:20	5	20	180	31.21	0.00	8.74	0.045	35.35	2.17	15.9	105.1	Clear	None
11:25	5	25	180	31.21	0.00	8.58	0.045	11.32	2.18	16	110.7	Clear	None
11:30	5	30	180	31.22	0.00	8.49	0.045	1.41	2.18	16.2	113.3	Clear	None
11:36	6	36	180	31.21	0.00	8.43	0.044	1.53	2.19	16.3	115.2	Clear	None
11:40	4	40	180	31.21	0.00	8.37	0.045	1.62	2.24	16.3	116.3	Clear	None
11:45	5	45	180	31.22	0.00	8.31	0.045	1.55	2.23	16.3	117.8	Clear	None
11:50	5	50	180	31.21	0.00	8.22	0.044	1.65	2.26	16.7	120.6	Clear	None
11:55	5	55	180	31.22	0.00	8.24	0.044	1.53	2.27	16.3	120.3	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: On the hill near the sand dunes

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	4753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

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Project Number	30048392	**Well ID**	SHL-3			**Date**	11/09/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	30.64	**Total Depth (ft-bmp)**	35.5	**Water Column(ft)**	4.86	**Gallons in Well**	0.79
MP Elevation		**Pump Intake (ft-bmp)**	34	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:25	**Volumes Purged**	4.68	**Sample ID**	SHL-3-FAL20	**Sampled by**	
Purge Start	14:15	**Gallons Purged**	3.70	**Replicate/ Code No.**			
Purge End	15:39						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:20	0	0	200	30.64	0.00	8.94	0.146	8.38	6.38	20.4	65	Clear	None
14:25	5	5	200	30.64	0.00	8.35	0.141	10.36	5.27	19.1	85.3	Clear	None
14:33	8	13	200	30.66	0.00	7.98	0.139	10.07	3.48	18.9	101.4	Clear	None
14:36	3	16	200	30.67	0.00	7.89	0.139	4.72	5.36	19.1	104.7	Clear	None
14:40	4	20	200	30.67	0.00	7.76	0.139	2.09	3.72	18.1	112.7	Clear	None
14:45	5	25	200	30.67	0.00	7.74	0.139	2.72	3.71	17.9	113.2	Clear	None
14:50	5	30	200	30.67	0.00	7.72	0.139	1.16	3.92	17.9	116.9	Clear	None
14:55	5	35	200	30.67	0.00	7.68	0.138	1.49	4.27	17	120.7	Clear	None
15:01	6	41	200	30.67	0.00	7.64	0.138	1.22	4.5	16.4	122.9	Clear	None
15:05	4	45	200	30.67	0.00	7.65	0.138	1.24	4.61	16.2	124.4	Clear	None
15:10	5	50	200	30.67	0.00	7.62	0.138	1.26	3.65	15.9	127.1	Clear	None
15:15	5	55	200	30.67	0.00	7.59	0.137	1.38	3.83	16.1	129.2	Clear	None
15:20	5	60	200	30.67	0.00	7.58	0.136	1.12	3.91	16.1	129.9	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Location:	On the sand hill	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-96-5B			**Date**	11/10/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	46.0 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.8	**Total Depth (ft-bmp)**	88.75	**Water Column(ft)**	80.95	**Gallons in Well**	52.61
MP Elevation		**Pump Intake (ft-bmp)**	85	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:40	**Volumes Purged**		**Sample ID**	SHM-96–5B-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	09:12	**Gallons Purged**		**Replicate/ Code No.**	SHL-DUP08-FAL20		
Purge End	10:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:14	0	0	200	7.7	0.00	7.67	0.296	20	5.4	12.3	161.5	Brown	None
09:17	3	3	200	7.73	0.00	6.81	0.308	120.9	2.73	11.9	45	Brown	None
09:21	4	7	200	7.73	0.00	6.31	0.316	130	1.52	11.7	20.1	Brown	None
09:24	3	10	200	7.73	0.00	6.17	0.322	93.6	1.2	11.9	13.3	Brown	None
09:27	3	13	200	7.73	0.00	6.13	0.32	124	1.08	11.7	9.6	Brown	None
09:31	4	17	200	7.73	0.00	6.14	0.32	123	1.09	11.7	6.3	Brown	None
09:35	4	21	200	7.73	0.00	6.17	0.324	124	1.07	12	2.6	Brown	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-10-08			**Date**	11/10/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	57.9 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.94	**Total Depth (ft-bmp)**	57.21	**Water Column(ft)**	47.27	**Gallons in Well**	4.32
MP Elevation		**Pump Intake (ft-bmp)**	52.21	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:25	**Volumes Purged**	0.29	**Sample ID**	SHM-10-08	**Sampled by**	Desmond Bedard
Purge Start	09:39	**Gallons Purged**	1.25	**Replicate/ Code No.**			
Purge End	10:25						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:45	0	0	125	9.94	0.20	6.69	0.688	7.42	0.62	13.7	97.3	Clear	None
09:50	5	5	100	9.95	0.33	6.53	0.66	5.62	0.53	14.2	114.8	Clear	None
09:55	5	10	100	9.95	0.46	6.48	0.646	5.43	0.53	14.1	117.3	Clear	None
10:00	5	15	100	9.95	0.59	6.45	0.645	4.56	0.45	14.3	117	Clear	None
10:05	5	20	100	9.95	0.73	6.45	0.648	4.67	0.37	14.4	114.8	Clear	None
10:10	5	25	100	9.95	0.86	6.45	0.654	4.83	0.36	14.6	113.6	Clear	None
10:15	5	30	100	9.95	0.99	6.46	0.656	4.65	0.36	14.7	113.2	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments: Initial purge appearance - clear; initial purge odor - none

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-96-5C			**Date**	11/10/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	32.0 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.07	**Total Depth (ft-bmp)**	80	**Water Column(ft)**	72.93	**Gallons in Well**	47.4
MP Elevation		**Pump Intake (ft-bmp)**	77	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:50	**Volumes Purged**		**Sample ID**	SHM-96-5C-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	10:28	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	11:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:29	0	0	200	7.07	0.00	6.53	0.331	17	1.02	12.7	8	Clear	None
10:32	3	3	200	7.07	0.00	6.4	0.33	14.8	0.85	12.8	8.9	Clear	None
10:35	3	6	200	7.07	0.00	6.32	0.333	12.9	0.75	13	9.3	Clear	None
10:38	3	9	200	7.07	0.00	6.29	0.334	13.4	0.72	13	8.8	Clear	None
10:41	3	12	200	7.07	0.00	6.27	0.335	12.6	0.69	13.1	8.4	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	no
Condition of Well:	Good condition	Well Locked at Departure:	no
Well Completion:	Stick-up	Key Number To Well:	M1

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EPA-PZ-2012-5A			**Date**	11/10/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	70.0 degrees F and Clear. The wind is blowing undefined at 12.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.01	**Total Depth (ft-bmp)**	27.43	**Water Column(ft)**	18.42	**Gallons in Well**	0.75
MP Elevation		**Pump Intake (ft-bmp)**	24	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:10	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-5A-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	11:40	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	12:20						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:42	0	0	200	9.05	0.00	7.5	0.076	8.5	2.3	14.3	126.5	Clear	None
11:46	4	4	200	9.05	0.00	5.87	0.078	27.2	0.79	13.2	110.7	Clear	None
11:50	4	8	200	9.05	0.00	5.58	0.081	26.5	0.7	13.1	107.8	Clear	None
11:54	4	12	200	9.05	0.00	5.47	0.082	20	0.66	13	106.6	Clear	None
11:57	3	15	200	9.05	0.00	5.41	0.081	16.3	0.64	12.9	105.8	Clear	None
12:00	3	18	200	9.05	0.00	5.39	0.081	12.1	0.62	13	105	Clear	None
12:04	4	22	200	9.05	0.00	5.38	0.081	12	0.6	12.9	103.3	Clear	None
12:07	3	25	200	9.05	0.00	5.37	0.081	12.1	0.59	13.1	102.5	Clear	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: M15

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EPA-PZ-2012-5B			**Date**	11/10/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	70.0 degrees F and Clear. The wind is blowing undefined at 12.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	8.28	**Total Depth (ft-bmp)**	85.82	**Water Column(ft)**	77.54	**Gallons in Well**	3.15
MP Elevation		**Pump Intake (ft-bmp)**	82	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:20	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-5B-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	12:45	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	13:30						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:50	0	0	200	8.35	0.00	6.49	0.347	76	1.92	14.8	51.6	Clear	None
12:53	3	3	200	8.35	0.00	6.2	0.335	52.4	1.32	13.9	62.2	Clear	None
12:56	3	6	200	8.35	0.00	6.18	0.332	35	1.1	13.6	67	Clear	None
12:59	3	9	200	8.35	0.00	6.17	0.333	27	0.97	13.5	69.8	Clear	None
13:03	4	13	200	8.35	0.00	6.15	0.332	19.6	0.92	13.3	72.2	Clear	None
13:06	3	16	200	8.35	0.00	6.15	0.333	15.8	0.88	13.3	73.4	Clear	None
13:10	4	20	200	8.35	0.00	6.16	0.333	10	0.85	13.3	73.6	Clear	None
13:14	4	24	200	8.35	0.00	6.16	0.334	9.7	0.84	13.3	74.4	Clear	None
13:17	3	27	200	8.35	0.00	6.17	0.333	9.6	0.82	13.2	74.7	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	M15

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHL-8D			**Date**	11/10/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	73.9 degrees F and Clear. The wind is blowing SW at 33.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	8.42	**Total Depth (ft-bmp)**	68.25	**Water Column(ft)**	59.83	**Gallons in Well**	9.72
MP Elevation		**Pump Intake (ft-bmp)**	65	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:35	**Volumes Purged**		**Sample ID**	SHL-8D-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	14:04	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	14:40						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:08	0	0	200	8.53	0.00	6.78	0.16	3.3	2.15	14.4	90.6	Clear	Strong
14:12	4	4	200	8.53	0.00	6.32	0.158	3.5	1.01	14.3	92.7	Clear	Strong
14:15	3	7	200	8.53	0.00	6.13	0.158	3.1	0.81	14.1	92.6	Clear	Strong
14:18	3	10	200	8.53	0.00	6.06	0.158	2.3	0.75	14.4	91.8	Clear	Strong
14:21	3	13	200	8.53	0.00	5.99	0.156	2.4	0.71	13.9	91.1	Clear	Strong
14:25	4	17	200	8.53	0.00	5.96	0.155	2.1	0.68	14	90	Clear	Strong
14:28	3	20	200	8.53	0.00	5.94	0.154	2	0.66	13.9	89	Clear	Strong

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments: No lock

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	no
Condition of Well:	Good condition	Well Locked at Departure:	no
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHL-8S			**Date**	11/10/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	75.0 degrees F and Clear. The wind is blowing SW at 33.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	8.47	**Total Depth (ft-bmp)**	56.16	**Water Column(ft)**	47.69	**Gallons in Well**	7.75
MP Elevation		**Pump Intake (ft-bmp)**	53	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:35	**Volumes Purged**		**Sample ID**	SHL-8S-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	14:54	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	15:45						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:58	0	0	200	8.88	0.00	7.15	0.068	3	5.53	14.3	100.7	Clear	None
15:01	3	3	200	9.05	0.00	6.57	0.067	3.2	4.31	13.4	120.4	Clear	None
15:05	4	7	200	9.08	0.00	6.32	0.067	3.6	4.18	13.8	131.3	Clear	None
15:07	2	9	200	9.1	0.00	6.21	0.067	2.2	4.14	13.9	138	Clear	None
15:10	3	12	200	9.05	0.00	6.13	0.067	2.4	4.12	14	144.8	Clear	None
15:13	3	15	200	9.05	0.00	6.08	0.067	2	4.07	14	149.3	Clear	None
15:17	4	19	200	9.05	0.00	6.02	0.067	2.5	4.06	13.7	155.7	Clear	None
15:20	3	22	200	9.05	0.00	6	0.066	2.2	4.07	13.3	160.3	Clear	None
15:23	3	25	200	9.05	0.00	5.98	0.066	2.3	4.07	13.3	162.5	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	no
Condition of Well:	Good condition	Well Locked at Departure:	no
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-10-02			**Date**	11/10/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	68.0 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	18.51	**Total Depth (ft-bmp)**	64.85	**Water Column(ft)**	46.34	**Gallons in Well**	4.24
MP Elevation		**Pump Intake (ft-bmp)**	59.85	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:00	**Volumes Purged**	0.34	**Sample ID**	SHM-10-02-FAL20	**Sampled by**	Desmond Bedard
Purge Start	11:07	**Gallons Purged**	1.44	**Replicate/ Code No.**			
Purge End	12:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:15	0	0	120	18.53	0.25	6.54	0.607	10.95	1.11	15.7	132.4	Clear	None
11:20	5	5	100	18.53	0.39	6.45	0.629	7.77	0.55	15.3	122.5	Clear	None
11:25	5	10	100	18.53	0.52	6.43	0.629	6.05	0.47	15.4	116.7	Clear	None
11:30	5	15	100	18.53	0.65	6.42	0.621	5.18	0.4	15	112	Clear	None
11:35	5	20	100	18.53	0.78	6.42	0.617	4.83	0.35	14.8	107.5	Clear	None
11:40	5	25	100	18.53	0.91	6.41	0.608	4.37	0.28	14.4	104.5	Clear	None
11:45	5	30	100	18.53	1.05	6.4	0.609	4.43	0.29	14.8	101.2	Clear	None
11:50	5	35	100	18.53	1.18	6.4	0.608	4.02	0.28	14.8	100.8	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments: Initial purge appearance - clear; initial purge odor - none

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-10-03			**Date**	11/10/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	73.0 degrees F and Clear. The wind is blowing SW at 29.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	27.15	**Total Depth (ft-bmp)**	70.12	**Water Column(ft)**	42.97	**Gallons in Well**	3.93
MP Elevation		**Pump Intake (ft-bmp)**	65.12	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:40	**Volumes Purged**	0.42	**Sample ID**	SHM-10-03-FAL20	**Sampled by**	Desmond Bedard
Purge Start	12:49	**Gallons Purged**	1.66	**Replicate/ Code No.**			
Purge End	13:40						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:55	0	0	150	27.17	0.24	6.93	0.57	12.92	1.91	15.3	134	Clear	None
13:00	5	5	120	27.17	0.40	6.86	0.593	9.48	1.02	16.2	131.6	Clear	None
13:05	5	10	120	27.17	0.55	6.86	0.61	11.11	0.92	16.7	124.1	Clear	None
13:10	5	15	120	27.17	0.71	6.92	0.611	9.97	0.73	16.7	116.1	Clear	None
13:15	5	20	120	27.17	0.87	6.81	0.608	10.51	0.63	16.6	106.7	Clear	None
13:20	5	25	120	27.17	1.03	6.81	0.608	9.78	0.56	16.6	102.4	Clear	None
13:25	5	30	120	27.17	1.19	6.8	0.601	9.56	0.56	16.2	94.2	Clear	None
13:30	5	35	120	27.17	1.35	6.8	0.598	9.84	0.52	16.5	93.5	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments: Initial purge appearance - clear; initial purge odor - none.

NOTE: Adjacent WWTP was in the process of transporting its waste sludge off site during purge; strong waster sludge odor was present in the air.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-13-08			**Date**	11/10/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	75.0 degrees F and Clear. The wind is blowing SW at 33.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	20.66	**Total Depth (ft-bmp)**	65.74	**Water Column(ft)**	45.08	**Gallons in Well**	7.33
MP Elevation		**Pump Intake (ft-bmp)**	60.74	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	16:05	**Volumes Purged**	0.18	**Sample ID**	SHM-13-08-FAL20	**Sampled by**	Desmond Bedard
Purge Start	15:14	**Gallons Purged**	1.35	**Replicate/ Code No.**			
Purge End	16:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:20	0	0	100	20.67	0.16	6.49	0.537	23.12	1.27	17.1	-82.4	Clear	None
15:25	5	5	100	20.67	0.29	6.5	0.598	18.99	0.45	17.4	-94.2	Clear	None
15:30	5	10	100	20.67	0.42	6.52	0.624	18.92	0.39	18.1	-103.5	Clear	None
15:35	5	15	100	20.67	0.55	6.53	0.635	16.58	0.34	18.9	-109.5	Clear	None
15:40	5	20	100	20.67	0.69	6.53	0.627	15.33	0.3	18.2	-115.4	Clear	None
15:45	5	25	100	20.67	0.82	6.54	0.625	15.14	0.27	18.1	-117.6	Clear	None
15:50	5	30	100	20.67	0.95	6.55	0.619	15.62	0.27	18.1	-118.7	Clear	None
15:55	5	35	100	20.67	1.08	6.55	0.612	15.87	0.27	18	-119.5	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments: Initial purge appearance - clear; initial purge odor - none.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition,Missing bolts

Well Completion: Flush mount

Well Locked at Arrival:

Well Locked at Departure:

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-10-07			**Date**	11/10/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	28.01	**Total Depth (ft-bmp)**	50	**Water Column(ft)**	21.99	**Gallons in Well**	3.57
MP Elevation		**Pump Intake (ft-bmp)**	45	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	16:20	**Volumes Purged**	0.97	**Sample ID**	SHM-20-07-FAL20	**Sampled by**	
Purge Start	15:01	**Gallons Purged**	3.45	**Replicate/ Code No.**			
Purge End	16:41						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:05	0	0	175	28.01	0.00	8.02	0.623	103.52	0.98	14.3	25.5	Gray	None
15:11	6	6	175	28.01	0.00	7.86	0.63	11.11	0.79	1.2	7.8	Gray	None
15:20	9	15	175	28.01	0.00	7.81	0.633	8.7	0.68	14.4	-10.6	Gray	None
15:24	4	19	175	28	0.00	7.79	0.639	5.65	0.65	13.8	-16	Gray	None
15:31	7	26	175	27.99	0.00	7.77	0.642	7.22	0.57	13.9	-23.1	Gray	None
15:35	4	30	175	27.99	0.00	7.77	0.646	8.07	0.55	13.5	-26.4	Gray	None
15:40	5	35	175	27.99	0.00	7.76	0.643	6.05	0.52	13.3	-32.4	Gray	None
15:45	5	40	175	27.99	0.00	7.75	0.643	4.19	0.47	13.4	-34.9	Gray	None
15:50	5	45	175	27.99	0.00	7.75	0.643	4.43	0.47	13.3	-37.1	Gray	None
15:55	5	50	175	27.99	0.00	7.75	0.645	5.77	0.47	13	-38.7	Gray	None
16:00	5	55	175	27.99	0.00	7.75	0.642	6.03	0.44	12.9	-40.9	Gray	None
16:05	5	60	175	27.99	0.00	7.74	0.644	5.56	0.41	12.7	-45.3	Gray	None
16:10	5	65	175	27.99	0.00	7.74	0.644	5.27	0.41	12.7	-45.4	Gray	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Amber	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Location:	Field	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-10-14			**Date**	11/10/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	67 °, Sunny, NE winds at 7 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21.11	**Total Depth (ft-bmp)**	80	**Water Column(ft)**	58.89	**Gallons in Well**	9.57
MP Elevation		**Pump Intake (ft-bmp)**	70	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:25	**Volumes Purged**	0.44	**Sample ID**	SHM-10-14-FAL20	**Sampled by**	Diane Champagne
Purge Start	11:05	**Gallons Purged**	4.23	**Replicate/ Code No.**			
Purge End	12:38						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:10	0	0	200	21.11	0.00	7.57	0.685	81.62	3.1	14.4	81.1	Silty grey	None
12:55	105	105	200	21.12	0.00	7.49	0.686	117.59	2.31	14.8	68.1	Silty grey	None
11:20	5	10	200	21.12	0.00	7.44	0.685	76.07	1.83	14.7	54.2	Silty grey	None
11:27	7	17	200	21.13	0.00	7.42	0.685	87.07	1.59	14.4	46.6	Silty grey	None
11:30	3	20	200	21.13	0.00	7.42	0.686	80.97	1.51	14.5	44.3	Silty grey	None
11:36	6	26	200	21.13	0.00	7.41	0.685	96.47	1.21	14.6	36.5	Silty grey	None
11:40	4	30	200	21.13	0.00	7.4	0.683	172.85	1.16	14.6	31.8	Silty grey	None
11:45	5	35	200	21.13	0.00	7.39	0.682	125.35	1.02	14.8	26.3	Silty grey	None
11:50	5	40	200	21.13	0.00	7.38	0.681	127.91	1.01	14.9	24.5	Silty grey	None
11:55	5	45	200	21.13	0.00	7.37	0.682	110.21	0.96	14.7	21.4	Silty grey	None
12:00	5	50	200	21.13	0.00	7.37	0.681	92.71	0.91	14.7	18.4	Silty grey	None
12:05	5	55	200	21.13	0.00	7.36	0.678	87.44	0.86	14.7	15.9	Silty grey	None
12:11	6	61	200	21.13	0.00	7.35	0.677	81.56	0.82	14.4	13.3	Silty grey	None
12:16	5	66	200	21.13	0.00	7.34	0.678	77.31	0.79	14.4	11.6	Silty grey	None
12:20	4	70	200	21.13	0.00	7.33	0.677	76.94	0.77	14.4	10	Silty grey	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Dissolved Organic Carbon	250 mL Amber	1	H2SO4
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfide	125 mL Plastic	1	None

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Middle of field	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-01-36X			**Date**	11/11/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	59.0 degrees F and Cloudy. The wind is blowing S/SE at 12.1 mph.			
Measuring Pt. Description	Top of Outer Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	7.28	**Total Depth (ft-bmp)**	12.96	**Water Column(ft)**	5.68	**Gallons in Well**	0.23
MP Elevation		**Pump Intake (ft-bmp)**	9	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:45	**Volumes Purged**		**Sample ID**	SHP-01-36X-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	09:00	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	09:55						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:03	0	0	200	7.31	0.00	7.81	0.267	30	2.01	13.7	74.4	Clear	None
09:06	3	3	200	7.31	0.00	7.53	0.252	30	1.4	13.5	65	Clear	None
09:09	3	6	200	7.31	0.00	7.26	0.242	30	1.25	13.2	53.2	Clear	None
09:12	3	9	200	7.31	0.00	7.06	0.236	20	1.2	13	50.6	Clear	None
09:16	4	13	200	7.31	0.00	6.84	0.233	16.2	1.12	13.1	49.8	Clear	None
09:19	3	16	200	7.31	0.00	6.73	0.232	11.5	1.06	13.2	48.5	Clear	None
09:23	4	20	200	7.31	0.00	6.61	0.231	6.8	1.01	13.4	48.1	Clear	None
09:26	3	23	200	7.31	0.00	6.54	0.23	5.1	1.06	13.4	48.7	Clear	None
09:29	3	26	200	7.31	0.00	6.47	0.23	3.7	1.07	13.3	50.3	Clear	None
09:33	4	30	200	7.31	0.00	6.42	0.227	3.4	1	13.5	49.5	Clear	None
09:36	3	33	200	7.31	0.00	6.42	0.232	2.7	0.97	13.6	46.3	Clear	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition,Missing lock

Well Completion: Stick-up

Well Locked at Arrival: no

Well Locked at Departure: no

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-01-37X			**Date**	11/11/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	69.1 degrees F and Cloudy. The wind is blowing W/SW at 41.1 mph.			
Measuring Pt. Description	Top of Outer Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	5.98	**Total Depth (ft-bmp)**	11.05	**Water Column(ft)**	5.07	**Gallons in Well**	0.21
MP Elevation		**Pump Intake (ft-bmp)**	8	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:10	**Volumes Purged**		**Sample ID**	SHP-01-37X-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	10:39	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	11:20						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:44	0	0	200	6.02	0.00	7.39	0.281	13.4	4.35	15.6	58.6	Clear	None
10:47	3	3	200	6.02	0.00	7.22	0.267	9.7	3.91	15.1	67.1	Clear	None
10:51	4	7	200	6.02	0.00	7.02	0.258	6	3.51	15	57	Clear	None
10:57	6	13	200	6.02	0.00	6.84	0.251	5.1	3.36	15.2	50	Clear	None
11:01	4	17	200	6.02	0.00	6.75	0.25	4	3.37	15.2	46.3	Clear	None
11:05	4	21	200	6.02	0.00	6.69	0.248	3.4	3.36	15.4	45.1	Clear	None
11:08	3	24	200	6.02	0.00	6.66	0.247	3.2	3.38	15.4	44.9	Clear	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

Well Completion: Stick-up

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-01-38A			**Date**	11/11/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	71.1 degrees F and Mostly Cloudy. The wind is blowing S/SW at 45.9 mph.			
Measuring Pt. Description	Top of Outer Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	3.95	**Total Depth (ft-bmp)**	9.13	**Water Column(ft)**	5.18	**Gallons in Well**	0.21
MP Elevation		**Pump Intake (ft-bmp)**	6	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:30	**Volumes Purged**		**Sample ID**	SHP-01-38A-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	11:58	**Gallons Purged**		**Replicate/ Code No.**	SHL-DUP04-FAL20		
Purge End	12:50						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:01	0	0	200	3.98	0.00	6.34	0.199	125	2.88	15.3	31.7	Clear	None
12:04	3	3	200	3.98	0.00	6.02	0.201	106.1	1.74	15.3	29.9	Clear	None
12:07	3	6	200	3.98	0.00	5.92	0.2	49.5	1.46	15	30	Clear	None
12:10	3	9	200	3.98	0.00	5.87	0.197	30.7	1.27	15.1	28.5	Clear	None
12:14	4	13	200	3.98	0.00	5.83	0.195	19.5	1.12	15	31.1	Clear	None
12:17	3	16	200	3.98	0.00	5.82	0.194	13.4	1.05	15	31.1	Clear	None
12:20	3	19	200	3.98	0.00	5.81	0.193	7.8	0.96	15.1	30.5	Clear	None
12:23	3	22	200	3.98	0.00	5.82	0.193	7.5	0.92	15.1	29.4	Clear	None
12:26	3	25	200	3.98	0.00	5.82	0.191	7.1	0.88	15	29.6	Clear	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-93-10D			**Date**	11/11/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	72.0 degrees F and Mostly Cloudy. The wind is blowing S/SW at 54.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	30.7	**Total Depth (ft-bmp)**	57.8	**Water Column(ft)**	27.1	**Gallons in Well**	17.61
MP Elevation		**Pump Intake (ft-bmp)**	54	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:50	**Volumes Purged**		**Sample ID**	SHM-93-10D-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	14:07	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	15:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:10	0	0	200	30.94	0.00	10.66	0.233	22.3	1.32	18	-114.5	Clear	None
14:13	3	3	200	31.02	0.00	10.92	0.238	10.6	1.12	18	-122.5	Clear	None
14:17	4	7	200	31.12	0.00	11.03	0.229	18.8	1.03	18.2	-126.2	Clear	None
14:22	5	12	200	31.22	0.00	11.05	0.263	25.9	1	18.6	-125.6	Clear	None
14:25	3	15	200	31.27	0.00	11.07	0.257	16	0.97	18.7	-124.4	Clear	None
14:30	5	20	200	31.35	0.00	11.09	0.269	17.3	0.98	18.7	-123.5	Clear	None
14:33	3	23	200	31.4	0.00	11.11	0.269	20.7	1	19	-123.9	Clear	None
14:36	3	26	200	31.43	0.00	11.13	0.267	16	1.04	19.1	-122.9	Clear	None
14:40	4	30	200	31.43	0.00	11.17	0.269	15.5	1.07	19.2	-122.3	Clear	None
14:43	3	33	200	31.51	0.00	11.19	0.275	15.7	1.08	19.4	-122	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	M1

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-07-03			**Date**	11/11/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	59.0 degrees F and Cloudy. The wind is blowing S/SE at 12.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	20.55	**Total Depth (ft-bmp)**	35	**Water Column(ft)**	14.45	**Gallons in Well**	2.35
MP Elevation		**Pump Intake (ft-bmp)**	30	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:20	**Volumes Purged**	0.99	**Sample ID**	SHM-07-03-FAL20	**Sampled by**	Diane Champagne
Purge Start	09:10	**Gallons Purged**	2.32	**Replicate/ Code No.**			
Purge End	10:33						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:25	0	0	120	21.4	0.00	7.59	1.491	35.17	9.45	13.2	87.7	Brown	
09:30	5	5	120	21.4	0.00	7.26	1.488	33.96	9.25	13.4	96.6	Brown	
09:35	5	10	120	21.4	0.00	6.91	1.497	29.19	8.99	13.5	109.1	Brown	
09:40	5	15	120	21.4	0.00	6.61	1.465	15.96	7.89	13.7	119.9	Brown	
09:46	6	21	120	21.4	0.00	6.38	1.424	12.86	8.06	13.7	127.3	Brown	
09:50	4	25	120	21.39	0.00	6.25	1.381	12.5	7.86	13.7	131.2	Brown	
09:56	6	31	120	21.38	0.00	6.1	1.352	12.76	7.57	13.8	135.1	Brown	
10:00	4	35	120	21.38	0.00	6.04	1.333	12.18	7.76	13.8	136.5	Brown	
10:05	5	40	120	21.38	0.00	5.93	1.292	12.12	7.82	13.9	138	Brown	
10:11	6	46	120	21.38	0.00	5.88	1.284	12.14	7.89	14.3	138.2	Brown	
10:15	4	50	120	21.38	0.00	5.84	1.275	12.92	7.85	14.2	138.5	Brown	

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Sculley st at the corner

Well Locked at Arrival: no

Condition of Well: Missing bolts,Needs repairs

Well Locked at Departure: no

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Flush mount

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-07-05X			**Date**	11/11/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	69.1 degrees F and Cloudy. The wind is blowing W/SW at 41.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	14.74	**Total Depth (ft-bmp)**	65	**Water Column(ft)**	50.26	**Gallons in Well**	8.17
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:50	**Volumes Purged**	0.38	**Sample ID**	SHM-07-05X-FAL20	**Sampled by**	Diane Champagne
Purge Start	10:45	**Gallons Purged**	3.14	**Replicate/ Code No.**			
Purge End	12:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:55	0	0	225	15.78	0.00	6.99	0.396	79.52	0.82	15.8	72.9	Dark Brown	
11:00	5	5	225	15.78	0.00	7.07	0.375	79.89	0.75	16.1	66.4	Dark Brown	
11:06	6	11	225	16.81	0.00	7.12	0.362	85.79	0.72	16.7	57.2	Dark Brown	
11:10	4	15	225	17.63	0.00	7.12	0.356	73.75	0.69	16.7	55.7	Dark Brown	
11:15	5	20	225	18.22	0.00	7.12	0.352	70.18	0.69	16.8	51.9	Dark Brown	
11:20	5	25	225	18.22	0.00	7.14	0.31	93.28	0.71	17.1	46.4	Dark Brown	
11:25	5	30	120	19.71	0.00	7.03	0.262	77.07	0.7	17.4	47.7	Dark Brown	
11:30	5	35	120	21.33	0.00	6.92	0.253	28.71	0.72	17.5	51.1	Dark Brown	
11:35	5	40	120	22.66	0.00	6.85	0.251	28.13	0.74	18.1	53.1	Dark Brown	
11:40	5	45	120	23.83	0.00	6.82	0.249	28.22	0.77	18.1	54.1	Dark Brown	
11:45	5	50	120	23.83	0.00	6.75	0.253	27.38	0.81	18.2	56.2	Dark Brown	

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Location:	Sculley st	Well Locked at Arrival:	no
Condition of Well:	Missing bolts,Needs repairs	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-05-40X			**Date**	11/11/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	71.1 degrees F and Mostly Cloudy. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	14.83	**Total Depth (ft-bmp)**	34	**Water Column(ft)**	19.17	**Gallons in Well**	3.11
MP Elevation		**Pump Intake (ft-bmp)**	33	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:50	**Volumes Purged**	0.45	**Sample ID**	SHM-05-40X-FAL20	**Sampled by**	Diane Champagne
Purge Start	12:15	**Gallons Purged**	1.41	**Replicate/ Code No.**	SHL-DUP10-FAL20		
Purge End	13:06						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:15	0	0	120	14.92	0.00	6.69	0.239	29.91	0.76	13.6	59.8	Clear	None
12:20	5	5	120	14.9	0.00	6.42	0.404	19.63	0.56	13.6	44.8	Clear	None
12:25	5	10	150	14.89	0.00	6.39	0.408	17.92	0.5	13.8	30.2	Clear	None
12:31	6	16	150	14.89	0.00	6.4	0.386	14.49	0.48	13.7	23.1	Clear	None
12:37	6	22	150	14.89	0.00	6.37	0.407	12.35	0.46	13.7	15.9	Clear	None
12:40	3	25	150	14.89	0.00	6.37	0.405	11.82	0.45	13.5	11.9	Clear	None
12:45	5	30	150	14.89	0.00	6.36	0.403	11.54	0.45	13.5	6.4	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	2	HNO3
Alkalinity	250 mL Plastic	2	None
Chloride,Sulfate	125 mL Plastic	2	None
Dissolved Organic Carbon	250 mL Amber	2	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Scully street	Well Locked at Arrival:	no
Condition of Well:	Cracked well pad,Needs repairs	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EPA-PZ-2012-6A			**Date**	11/11/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	72.0 degrees F and Partly Cloudy. The wind is blowing S at 54.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	23.78	**Total Depth (ft-bmp)**	33	**Water Column(ft)**	9.22	**Gallons in Well**	0.37
MP Elevation		**Pump Intake (ft-bmp)**	30	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:30	**Volumes Purged**	6.61	**Sample ID**	EPA-PZ-2012-06A-FAL20	**Sampled by**	Diane Champagne
Purge Start	13:30	**Gallons Purged**	2.44	**Replicate/ Code No.**			
Purge End	14:38						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:40	0	0	150	23.8	0.00	6.88	0.115	49.42	7.23	17.4	26.6	Clear	None
13:45	5	5	150	23.8	0.00	6.74	0.117	18.91	7.15	17.2	36.3	Clear	None
13:50	5	10	150	23.78	0.00	6.65	0.118	16.54	7.11	17.2	44.1	Clear	None
13:56	6	16	150	23.78	0.00	6.62	0.117	15.32	7.08	17.3	46.4	Clear	None
14:00	4	20	150	23.78	0.00	6.54	0.117	6.57	7.08	17.3	53.1	Clear	None
14:05	5	25	150	23.77	0.00	6.51	0.117	5.63	7.19	17.1	56.4	Clear	None
14:10	5	30	150	23.77	0.00	6.45	0.117	4.26	7.06	16.9	61.1	Clear	None
14:16	6	36	150	23.77	0.00	6.44	0.116	4.12	7.09	16.9	62.1	Clear	None
14:20	4	40	150	23.77	0.00	6.41	0.116	4.04	7.1	16.9	64.8	Clear	None
14:25	5	45	150	23.77	0.00	6.4	0.116	4.23	7.13	16.8	65.7	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Near treatment building road

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

Well Completion: Stick-up

Key Number To Well: EPA key

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	EPA-PZ-2012-6B			**Date**	11/11/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	71.1 degrees F and Mostly Clear. The wind is blowing S/SW at 20.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	23.58	**Total Depth (ft-bmp)**	79.23	**Water Column(ft)**	55.65	**Gallons in Well**	2.26
MP Elevation		**Pump Intake (ft-bmp)**	77	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:30	**Volumes Purged**	0.92	**Sample ID**	EPA-PZ-2012-6B-FAL20	**Sampled by**	
Purge Start	14:45	**Gallons Purged**	2.08	**Replicate/ Code No.**			
Purge End	15:42						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:50	0	0	150	23.59	0.00	6.31	0.137	22.29	0.8	15.9	70.7	Clear	None
14:55	5	5	175	23.59	0.00	6.37	0.141	26.34	0.63	15.6	55.5	Clear	None
15:00	5	10	175	23.59	0.00	6.38	0.146	9.79	0.56	16.2	43.6	Clear	None
15:05	5	15	175	23.59	0.00	6.4	0.149	3.09	0.53	15.8	31.8	Clear	None
15:10	5	20	175	23.59	0.00	6.42	0.15	3.14	0.51	15.8	21.1	Clear	None
15:15	5	25	175	23.59	0.00	6.45	0.15	2.42	0.47	15.3	3.1	Clear	None
15:20	5	30	175	23.59	0.00	6.45	0.15	2.13	0.47	15.3	0.7	Clear	None
15:25	5	35	175	23.59	0.00	6.45	0.15	2.34	0.46	15.4	-1.6	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Near fence at road to treatment building	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	EPA key

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-10-12			**Date**	11/11/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	72.0 degrees F and Mostly Cloudy. The wind is blowing S/SW at 54.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	34.77	**Total Depth (ft-bmp)**	58.68	**Water Column(ft)**	23.91	**Gallons in Well**	3.89
MP Elevation		**Pump Intake (ft-bmp)**	53.68	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	16:05	**Volumes Purged**	0.85	**Sample ID**	SHM-10-12-FAL20	**Sampled by**	Desmond Bedard
Purge Start	14:59	**Gallons Purged**	3.30	**Replicate/ Code No.**	SHM-10-12-FAL20 MS; SHM-10-12-FAL20 MSD		
Purge End	16:20						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:10	0	0	180	34.77	0.52	5.82	96.2	62.99	0.72	13.2	95.5	Clear	None
15:15	5	5	150	34.77	0.72	5.82	0.284	52.08	0.67	13	84.1	Clear	None
15:20	5	10	150	34.77	0.92	5.8	0.387	31.34	0.61	12.6	74.1	Clear	None
15:25	5	15	150	34.77	1.12	5.8	0.39	25.91	0.59	12.7	70.7	Clear	None
15:30	5	20	150	34.77	1.32	5.79	0.392	20.42	0.56	12.8	66.1	Clear	None
15:35	5	25	150	34.77	1.51	5.78	0.394	17.08	0.54	12.6	61.4	Clear	None
15:40	5	30	150	34.77	1.71	5.78	0.393	14.31	0.52	12.3	58	Clear	None
15:45	5	35	150	34.77	1.91	5.78	0.394	13.19	0.51	12.3	55.5	Clear	None
15:50	5	40	150	34.77	2.11	5.78	0.394	13.09	0.5	12.3	53.6	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	3	HNO3
Alkalinity	250 mL Plastic	3	None
Chloride,Sulfate	125 mL Plastic	3	None
Dissolved Organic Carbon	250 mL Amber	3	H2SO4

Comments: Initial purge appearance - grey haze; initial purge odor - slight garbage smell.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	no
Condition of Well:	Good condition	Well Locked at Departure:	no
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-93-18B			**Date**	11/12/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	62.1 degrees F and Cloudy. The wind is blowing N/NW at 41.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	19.22	**Total Depth (ft-bmp)**	90.95	**Water Column(ft)**	71.73	**Gallons in Well**	46.62
MP Elevation		**Pump Intake (ft-bmp)**	87	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:30	**Volumes Purged**		**Sample ID**	SHM-93-18B-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	08:50	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	09:48						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:57	0	0	200	19.26	0.00	7.79	0.351	26.7	4.33	12.8	185.9	Clear	None
09:00	3	3	200	19.26	0.00	7.04	0.396	13.6	1.84	12.7	204.7	Clear	None
09:03	3	6	200	19.26	0.00	6.54	0.406	110	1.04	12.7	210.3	Clear	None
09:08	5	11	200	19.26	0.00	6.23	0.4	7.5	0.83	12.6	212.6	Clear	None
09:11	3	14	200	19.26	0.00	6.1	0.397	9.6	0.79	12.6	213.6	Clear	None
09:14	3	17	200	19.26	0.00	6.02	0.398	11.8	0.75	12.7	214	Clear	None
09:17	3	20	200	19.26	0.00	5.96	0.397	9	0.72	12.7	214.3	Clear	None
09:21	4	24	200	19.26	0.00	5.9	0.395	9	0.71	12.5	215.1	Clear	None
09:24	3	27	200	19.26	0.00	5.86	0.392	8.5	0.69	12.6	215.9	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	NA	NA	NA
Alkalinity	NA	NA	NA
Chloride,Sulfate	NA	NA	NA
Dissolved Organic Carbon	NA	NA	NA

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHL-4			**Date**	11/12/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	61.0 degrees F and Cloudy. The wind is blowing NW at 29.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.65	**Total Depth (ft-bmp)**	14.77	**Water Column(ft)**	4.12	**Gallons in Well**	0.67
MP Elevation		**Pump Intake (ft-bmp)**	11	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:00	**Volumes Purged**		**Sample ID**	SHL-4-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	10:30	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	11:13						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:34	0	0	200	10.66	0.00	6.53	0.135	348	2.49	13.1	27.3	Brown	None
10:37	3	3	200	10.66	0.00	6.2	0.135	190	1.41	12.9	12	Brown	None
10:40	3	6	200	10.66	0.00	6.08	0.144	164	0.93	12.8	-5.4	Brown	None
10:43	3	9	200	10.66	0.00	6.03	0.145	101.1	0.87	12.9	-10.4	Brown	None
10:46	3	12	200	10.66	0.00	6.01	0.146	73.1	0.82	12.7	-13.1	Brown	None
10:49	3	15	200	10.66	0.00	6	0.147	65.3	0.79	12.7	-14.4	Brown	None
10:53	4	19	200	10.66	0.00	6	0.147	65.3	0.8	12.8	-15.9	Brown	None
10:56	3	22	200	10.66	0.00	6	0.147	65.2	0.8	12.7	-17.2	Brown	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-10-11			**Date**	11/12/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	41.28	**Total Depth (ft-bmp)**	63.8	**Water Column(ft)**	22.52	**Gallons in Well**	3.66
MP Elevation		**Pump Intake (ft-bmp)**	58.8	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:20	**Volumes Purged**	0.45	**Sample ID**	SHM-10-11-FAL20	**Sampled by**	Desmond Bedard
Purge Start	10:21	**Gallons Purged**	1.64	**Replicate/ Code No.**			
Purge End	11:20						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:30	0	0	105	41.31	0.25	6.11	0.582	510.2	0.29	13.3	49.6	Clear	None
10:35	5	5	105	41.31	0.39	6.01	0.563	199.23	0.28	12.8	39.9	Clear	None
10:40	5	10	105	41.31	0.53	5.97	0.553	102.81	0.29	12.6	35.9	Clear	None
10:45	5	15	105	41.31	0.67	5.96	0.546	47.29	0.28	12.4	30.6	Clear	None
10:50	5	20	105	41.31	0.80	5.96	0.546	27.89	0.23	12.2	25.2	Clear	None
10:55	5	25	105	41.31	0.94	5.96	0.545	24.88	0.23	12.1	22.4	Clear	None
11:00	5	30	105	41.31	1.08	5.97	0.544	19.83	0.19	12.1	20.4	Clear	None
11:05	5	35	105	41.31	1.22	5.97	0.543	19.38	0.19	12	17.9	Clear	None
11:10	5	40	105	41.31	1.36	5.97	0.541	19.02	0.19	12	15.9	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments: Purge start delay due to issues with regulator and tubing; switching both worked.

Initial purge appearance - grey clouds/haze; initial purge odor - none

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-10-16			**Date**	11/12/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	61.0 degrees F and Cloudy. The wind is blowing N/NW at 16.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	8.6	**Total Depth (ft-bmp)**	87.4	**Water Column(ft)**	78.8	**Gallons in Well**	12.8
MP Elevation		**Pump Intake (ft-bmp)**	84	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:30	**Volumes Purged**		**Sample ID**	SHM-10-16-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	12:03	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	12:40						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:09	0	0	200	8.6	0.00	6.13	0.359	28	2.68	11.6	-37.3	Clear	None
12:11	2	2	200	8.6	0.00	6.11	0.383	35	1.42	11.5	-53	Clear	None
12:14	3	5	200	8.6	0.00	6.15	0.392	28.5	1.12	11.5	-57.9	Clear	None
12:17	3	8	200	8.6	0.00	6.19	0.394	25.9	0.95	11.5	-61.8	Clear	None
12:20	3	11	200	8.6	0.00	6.21	0.392	25.1	0.9	11.5	-63.9	Clear	None
12:23	3	14	200	8.6	0.00	6.22	0.387	25.9	0.87	11.5	-65.4	Clear	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-10-05A			**Date**	11/12/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	59.0 degrees F and Cloudy. The wind is blowing N at 45.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	25.21	**Total Depth (ft-bmp)**	60.13	**Water Column(ft)**	34.92	**Gallons in Well**	1.42
MP Elevation		**Pump Intake (ft-bmp)**	57	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:55	**Volumes Purged**		**Sample ID**	SHM-10-05A-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	13:21	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	14:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:29	0	0	200	25.23	0.00	6.75	0.168	388	3.8	13.6	108.3	Clear	None
13:32	3	3	200	25.23	0.00	6.29	0.168	55	1.98	13.3	122.2	Clear	None
13:35	3	6	200	25.23	0.00	6.01	0.168	263	1.49	13.5	131.6	Clear	None
13:38	3	9	200	25.23	0.00	5.87	0.168	220	1.34	13.4	137.4	Clear	None
13:41	3	12	200	25.23	0.00	5.77	0.167	260	1.27	13.4	144	Clear	None
13:44	3	15	200	25.23	0.00	5.73	0.166	7	1.25	13.2	147.8	Clear	None
13:47	3	18	200	25.23	0.00	5.69	0.165	6.3	1.23	13.4	152.2	Clear	None
13:50	3	21	200	25.23	0.00	5.67	0.165	6.27	1.23	13.4	155.3	Clear	None
13:53	3	24	200	25.23	0.00	5.64	0.165	6.2	1.21	13.5	157.7	Clear	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	no
Condition of Well:	Cracked well pad,Good condition,Missing bolts	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHL-23			**Date**	11/12/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	62.1 degrees F and Cloudy. The wind is blowing N/NW at 41.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	30.4	**Total Depth (ft-bmp)**	35	**Water Column(ft)**	4.6	**Gallons in Well**	2.99
MP Elevation		**Pump Intake (ft-bmp)**	34	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:20	**Volumes Purged**	1.08	**Sample ID**	SHL-23-FAL20	**Sampled by**	Diane Champagne
Purge Start	09:05	**Gallons Purged**	3.22	**Replicate/ Code No.**			
Purge End	10:31						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:10	0	0	160	30.4	0.00	10.49	0.041	3.35	10.57	11.1	55.1	Clear	None
09:15	5	5	160	30.4	0.00	9.66	0.038	3.74	9.53	10.8	75.5	Clear	None
09:21	6	11	160	30.4	0.00	8.78	0.038	3.86	9.55	10.8	105.7	Clear	None
09:25	4	15	160	30.4	0.00	8.33	0.038	7.63	9.77	10.7	125.1	Clear	None
09:30	5	20	160	30.4	0.00	7.65	0.038	1.81	9.84	10.7	156.4	Clear	None
09:35	5	25	160	30.4	0.00	7.5	0.039	1.87	9.34	10.7	163.1	Clear	None
09:41	6	31	160	30.4	0.00	7.16	0.039	5.21	9.7	10.7	176.2	Clear	None
09:45	4	35	160	30.4	0.00	6.88	0.04	8.13	9.91	10.7	185.9	Clear	None
09:50	5	40	160	30.4	0.00	6.85	0.04	7.77	10.1	10.7	186.7	Clear	None
09:56	6	46	160	30.4	0.00	6.73	0.041	1.42	9.91	10.7	191.1	Clear	None
10:00	4	50	160	30.4	0.00	6.69	0.041	1.63	9.75	10.6	192.9	Clear	None
10:06	6	56	160	30.4	0.00	6.59	0.042	1.91	9.84	10.7	196.4	Clear	None
10:10	4	60	160	30.4	0.00	6.56	0.042	1.16	9.7	10.6	197.8	Clear	None
10:15	5	65	160	30.4	0.00	6.52	0.043	1.06	10.05	10.6	199.8	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Information

Well Location:	Edge of property near treatment building	Well Locked at Arrival:	yes
Condition of Well:	Needs repairs	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-06A			**Date**	11/12/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	29.3	**Total Depth (ft-bmp)**	86	**Water Column(ft)**	56.7	**Gallons in Well**	5.18
MP Elevation		**Pump Intake (ft-bmp)**	83	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:40	**Volumes Purged**	0.24	**Sample ID**	SHP-2016-6A-FAL20	**Sampled by**	Diane Champagne
Purge Start	11:00	**Gallons Purged**	1.25	**Replicate/ Code No.**			

Purge End

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:05	0	0	100	29.3	0.00	7.74	0.457	57.74	5.22	12.2	102.8	Black	Mild
11:10	5	5	120	31.99	0.00	8.11	0.393	7.19	0.83	11.6	38.5	Black	Mild
11:15	5	10	120	32.92	0.00	8.12	0.392	7.29	0.79	11.6	36.3	Black	Mild
11:20	5	15	120	33.88	0.00	8.15	0.391	7.22	0.64	11.7	29.3	Black	Mild
11:25	5	20	120	34.01	0.00	8.19	0.392	7.35	0.56	11.9	20.2	Black	Mild
11:29	4	24	120	35.71	0.00	8.24	0.396	3.63	0.48	11.9	10.8	Black	Mild
11:31	2	26	60	35.71	0.00	8.25	0.397	3.21	0.45	12	7.1	Black	Mild
11:35	4	30	60	36.67	0.00	8.27	0.399	3.15	0.44	11.9	2.8	Black	Mild

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Near fence line	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-06B			**Date**	11/12/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	59.0 degrees F and Cloudy. The wind is blowing N at 45.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	22.22	**Total Depth (ft-bmp)**	112	**Water Column(ft)**	89.78	**Gallons in Well**	8.21
MP Elevation		**Pump Intake (ft-bmp)**	107	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:40	**Volumes Purged**		**Sample ID**	SHP-2016-06B-FAL20	**Sampled by**	Diane Champagne
Purge Start	12:43	**Gallons Purged**	0.00	**Replicate/ Code No.**			

Purge End

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:51	0	0	90	22.22	0.00	8.67	0.493	6.17	1.41	10.4	20.5	Clear	None
12:56	5	5	90	25	0.00	8.68	0.489	5.26	0.76	10.4	15.1	Clear	None
13:01	5	10	70	25.5	0.00	8.69	0.486	6.03	0.69	10.5	11.5	Clear	None
13:05	4	14	70	25.68	0.00	8.68	0.489	6.2	0.64	10.5	8.2	Clear	None
13:11	6	20	70	25.83	0.00	8.68	0.493	6.36	0.6	10.4	5.2	Clear	None
13:17	6	26	70	26.01	0.00	8.69	0.496	6.51	0.54	10.3	1.5	Clear	None
13:25	8	34	70	26.12	0.00	8.69	0.499	6.76	0.49	10.3	-2.3	Clear	None
13:30	5	39	70	26.12	0.00	8.7	0.5	7.16	0.46	10.2	-5.3	Clear	None
13:35	5	44	70	26.23	0.00	8.7	0.501	7.22	0.45	10.2	-7.5	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Well Locked at Arrival:

Condition of Well:

Well Locked at Departure:

Well Completion: NA

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-06C			**Date**	11/12/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	54.0 degrees F and Light Rain. The wind is blowing N at 29.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	24.4	**Total Depth (ft-bmp)**	133	**Water Column(ft)**	108.6	**Gallons in Well**	9.93
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:25	**Volumes Purged**	0.18	**Sample ID**	SHP-2016-06C-FAL20	**Sampled by**	Diane Champagne
Purge Start	14:25	**Gallons Purged**	1.79	**Replicate/ Code No.**			

Purge End

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:30	0	0	105	24.4	0.00	9.05	0.257	3.99	0.94	9.9	-2.5	Clear	None
14:36	6	6	105	24.4	0.00	9.03	0.257	4.25	0.72	9.9	-2.4	Clear	None
14:40	4	10	105	24.55	0.00	9.01	0.257	4.51	0.59	9.8	-2.6	Clear	None
14:45	5	15	105	24.67	0.00	9.01	0.256	4.83	0.59	9.8	-2.7	Clear	None
14:50	5	20	105	24.67	0.00	8.99	0.257	5.34	0.7	9.8	-2.9	Clear	None
14:55	5	25	105	24.77	0.00	8.99	0.257	6.05	0.69	9.7	-3.5	Clear	None
15:00	5	30	105	24.85	0.00	8.99	0.257	6.34	0.66	9.7	-3.9	Clear	None
15:07	7	37	105	24.9	0.00	8.99	0.256	6.81	0.44	9.6	-5.1	Clear	None
15:11	4	41	105	24.93	0.00	8.98	0.256	6.69	0.38	9.6	-5.9	Clear	None
15:15	4	45	105	24.92	0.00	8.98	0.256	7.01	0.36	9.5	-6.6	Clear	None
15:20	5	50	105	24.92	0.00	8.98	0.256	7.13	0.36	9.6	-7.8	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	1	HNO3
Alkalinity	250 mL Plastic	1	None
Chloride,Sulfate	125 mL Plastic	1	None
Dissolved Organic Carbon	250 mL Amber	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Near fence

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-07B			**Date**	11/12/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	52.0 degrees F and Cloudy. The wind is blowing N/NE at 41.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	32.99	**Total Depth (ft-bmp)**	79.95	**Water Column(ft)**	46.96	**Gallons in Well**	7.63
MP Elevation		**Pump Intake (ft-bmp)**	77	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:00	**Volumes Purged**		**Sample ID**	SHP-2016-07B-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	08:12	**Gallons Purged**		**Replicate/ Code No.**	SHL-DUP05-FAL20		
Purge End	09:59						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:12	0	0	200	33.45	0.00	8.03	0.193	500	2.79	10.1	-6.3	Clear	None
08:20	8	8	200	34.55	0.00	7.43	0.189	110	1.15	10	-18.8	Clear	None
08:26	6	14	200	34.6	0.00	7.28	0.186	69	1.16	9.6	-19.5	Clear	None
08:29	3	17	200	34.6	0.00	7.22	0.185	60	1.18	9.4	-19.1	Clear	None
08:32	3	20	200	34.55	0.00	7.16	0.18	50	1.25	8.7	-17.7	Clear	None
08:35	3	23	200	34.55	0.00	7.13	0.176	40	1.37	8.4	-15.9	Clear	None
08:38	3	26	200	34.55	0.00	7.08	0.175	41.3	1.38	8.6	-14	Clear	None
08:43	5	31	200	34.6	0.00	7.05	0.174	42.1	1.38	8.4	-13.5	Clear	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-10-04			**Date**	11/12/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	59.0 degrees F and Cloudy. The wind is blowing N at 45.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.56	**Total Depth (ft-bmp)**	65.11	**Water Column(ft)**	59.55	**Gallons in Well**	5.44
MP Elevation		**Pump Intake (ft-bmp)**	60.11	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:25	**Volumes Purged**	0.24	**Sample ID**	SHM-10-04-FAL20	**Sampled by**	Desmond Bedard
Purge Start	12:36	**Gallons Purged**	1.29	**Replicate/ Code No.**	SHM-10-04-FAL20 MS; SHM-10-04-FAL20 MSD		
Purge End	13:25						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:40	0	0	100	5.57	0.11	6.4	0.393	10.78	2.54	11.8	64.8	Clear	None
12:45	5	5	100	5.57	0.24	6.08	0.456	9.53	1.01	11.7	38.8	Clear	None
12:50	5	10	100	5.57	0.37	6.05	0.459	7.6	0.89	11.6	94.2	Clear	None
12:55	5	15	100	5.57	0.50	6.04	0.46	6.28	0.79	11.6	95.4	Clear	None
13:00	5	20	100	5.57	0.63	6.04	0.459	6.99	0.77	11.6	95.6	Clear	None
13:05	5	25	100	5.57	0.77	6.03	0.459	6.01	0.73	11.6	96	Clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals	250 mL Plastic	3	HNO3
Alkalinity	250 mL Plastic	3	None
Chloride,Sulfate	125 mL Plastic	3	None
Dissolved Organic Carbon	250 mL Amber	3	H2SO4

Comments: Lock is too small to close.

Initial purge appearance - clear; initial purge odor - none.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	no
Condition of Well:	Good condition	Well Locked at Departure:	no
Well Completion:	Stick-up	Key Number To Well:	Unknown

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHM-10-06A			**Date**	11/13/2020
Project Name/Location	Devens, Massachusetts		**Weather(°F)**	39.9 degrees F and Fog/Mist. The wind is blowing N at 25.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	35.57	**Total Depth (ft-bmp)**	89.26	**Water Column(ft)**	53.69	**Gallons in Well**	2.18
MP Elevation		**Pump Intake (ft-bmp)**	86	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:45	**Volumes Purged**		**Sample ID**	SHM-10-06A-FAL20	**Sampled by**	Connor Rosenbaum
Purge Start	10:55	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	11:59						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:05	0	0	200	35.6	0.00	7.06	0.104	29.5	6.52	9.4	54	Clear	None
11:08	3	3	200	35.6	0.00	6.3	0.14	8.5	4.3	9.3	60.1	Clear	None
11:11	3	6	200	35.6	0.00	5.91	0.149	6.4	1.79	9.3	58.3	Clear	None
11:14	3	9	200	35.6	0.00	5.74	0.15	6.2	1.15	9.5	55.7	Clear	None
11:17	3	12	200	35.6	0.00	5.66	0.149	6.3	1	9.4	53.8	Clear	None
11:20	3	15	200	35.6	0.00	5.63	0.0149	5.2	0.094	9.3	52.7	Clear	None
11:24	4	19	200	35.6	0.00	5.6	0.149	5.5	0.88	9.3	51.9	Clear	None
11:27	3	22	200	35.6	0.00	5.59	0.151	6.1	0.84	9.3	50.9	Clear	None
11:30	3	25	200	35.6	0.00	5.59	0.15	6.3	0.82	9.3	50	Clear	None

Constituent Sampled	Container	Number	Preservative

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

Well Completion: Stick-up

Key Number To Well: M15

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	PZ-12-02			**Date**	5/15/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 74
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	19.29	**Total Depth (ft-bmp)**	34	**Water Column(ft)**	15	**Gallons in Well**	2.39
MP Elevation		**Pump Intake (ft-bmp)**	29	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:10	**Volumes Purged**		**Sample ID**	PZ-12-02 -spr20	**Sampled by**	Diane Champagne
Purge Start	#Error	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	15:21						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:20		220	19.29	0.00	5.03	0.713	28.9	1.18	14.36	241.1	Pale orange	No
14:25	5	220	19.29	0.00	4.84	0.711	27.2	0.87	15.14	225.7	Pale orange	No
14:30	5	220	19.29	0.00	4.67	0.717	15.6	0.57	15.15	211.8	Pale orange	No
14:35	5	220	19.29	0.00	4.62	0.714	14	0.55	13.96	203.7	Pale orange	No
14:41	6	220	19.29	0.00	5.05	0.709	8.04	0.55	13.26	153.4	Pale orange	No
14:45	4	220	19.29	0.00	5.15	0.706	7.88	0.58	13.74	142.4	Pale orange	No
14:50	5	220	19.29	0.00	5.27	0.707	8.04	0.57	13.43	127.9	Pale orange	No
14:55	5	220	19.29	0.00	5.5	0.707	7.61	0.57	13.85	104.08	Pale orange	No
15:00	5	220	19.29	0.00	5.53	0.709	7.88	0.56	13.54	100.1	Pale orange	No
15:05	5	220	19.29	0.00	5.49	0.71	7.77	0.56	13.66	99.1	Pale orange	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Landfill east

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	PZ-12-07			**Date**	5/15/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 69
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	NA
Static Water Level (ft-bmp)	27.3	**Total Depth (ft-bmp)**	30	**Water Column(ft)**	3	**Gallons in Well**	0.44
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	#Error	**Volumes Purged**		**Sample ID**	PZ-12-07 -SPR20	**Sampled by**	Diane Champagne
Purge Start	12:32	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	14:05						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:35		220	23.24	0.00	6.03	0.07	333	10.04	12.52	217.8	Orange	No
12:41	6	220	23.24	0.00	5.08	0.193	130	9.96	12.36	279.6	Orange	No
12:45	4	220	23.24	0.00	5.14	0.226	114	7.79	12.44	288.7	Orange	No
12:51	6	220	23.24	0.00	5.12	0.225	104	6.77	12.82	298.4	Orange	No
12:55	4	220	23.24	0.00	4.66	0.224	74.3	6.44	12.4	325.4	Orange	No
13:00	5	220	23.24	0.00	5.07	0.226	60.9	6.79	12.34	330.9	Orange	No
13:05	5	220	23.24	0.00	5.11	0.222	50.1	6.54	12.27	330.2	Orange	No
13:10	5	220	23.24	0.00	5.22	0.224	37.7	6.47	11.89	321	Orange	No
13:16	6	220	23.24	0.00	5.46	0.226	27.8	6.7	12.06	301.1	Orange	No
13:20	4	220	23.24	0.00	5.47	0.228	18.8	7.83	12.16	295.6	Orange	No
13:25	5	220	23.24	0.00	5.49	0.226	25.5	7.85	12.37	288.6	Orange	No
13:30	5	220	23.24	0.00	5.46	0.222	7.68	8.03	12.28	287.7	Orange	No
13:35	5	220	23.24	0.00	5.86	0.227	7.2	8.59	12.09	253.2	Orange	No
13:40	5	220	23.24	0.00	5.57	0.225	7.77	7.98	12.63	262.5	Orange	No
13:45	5	220	23.24	0.00	5.47	0.228	7.52	7.61	12.75	272.7	Orange	No
13:50	5	220	23.24	0.00	5.53	0.225	7.44	7.45	12.65	272.1	Orange	No
13:55	5	220	23.24	0.00	5.44	0.227	7.46	7.78	12.48	273.6	Orange	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Overlooking pond to the east	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	PZ-12-09			**Date**	5/15/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 57
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	23.2	**Total Depth (ft-bmp)**	32.9	**Water Column(ft)**	10	**Gallons in Well**	1.58
MP Elevation		**Pump Intake (ft-bmp)**	20	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:55	**Volumes Purged**		**Sample ID**	PZ-12-09 -SPR20	**Sampled by**	Diane Champagne
Purge Start	#Error	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	12:17						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:40		220	23.24	0.00	6.09	0.205	81.5	1.48	12.65	131.5		
10:45	5	220	23.24	0.00	6	0.204	89.9	1.28	12.54	135.9		
10:50	5	220	23.24	0.00	5.61	0.198	48.9	1.11	12.34	156.9		
10:55	5	220	23.24	0.00	5.6	0.197	38.7	1.09	12.36	167.2		
11:00	5	220	23.24	0.00	5.6	0.197	30.8	1.15	12.34	173		
11:05	5	220	23.24	0.00	5.61	0.197	24.4	1.4	12.35	180		
11:10	5	220	23.24	0.00	5.53	0.195	24.1	1.87	12.49	190.8		
11:15	5	220	23.24	0.00	5.36	0.192	13.3	2.46	12.61	204.4		
11:21	6	220	23.24	0.00	5.09	0.189	13	3.62	12.54	228.8		
11:25	4	220	23.24	0.00	4.74	0.186	5.63	4.62	12.15	265.6		
11:30	5	220	23.24	0.00	4.84	0.181	6.27	5.75	12.2	270		
11:35	5	220	23.24	0.00	4.77	0.181	5.83	5.32	12.15	281.6		
11:40	5	220	23.24	0.00	4.78	0.177	4.54	5.54	12.58	282.5		
11:45	5	220	23.24	0.00	4.68	0.176	5.1	5.85	12.49	286.3		
11:50	5	220	23.24	0.00	4.7	0.177	4.89	5.94	12.37	284.9		

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Comments:

Well Casing Volume Conversion

Well diameter (inches)	1 = 0.04	1.5 = 0.09	2.5 = 0.26	3.5 = 0.50	6 = 1.47
= gallons per foot	1.25 = 0.06	2 = 0.16	3 = 0.37	4 = 0.65	

Well Information

Well Location:	Landfill near sand	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	PZ-12-10			**Date**	5/15/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 57
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	20.9	**Total Depth (ft-bmp)**	32	**Water Column(ft)**	11	**Gallons in Well**	1.8
MP Elevation		**Pump Intake (ft-bmp)**	26	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:05	**Volumes Purged**		**Sample ID**	PZ-12-10 -spr20	**Sampled by**	Diane Champagne
Purge Start	#Error	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	10:36						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:05		220	20.94	0.00	6.92	0.069	6.28	9.78	10.32	98.6		
09:10	5	220	20.94	0.00	6.81	0.069	6.02	10.58	10.55	101.2		
09:15	5	220	20.96	0.00	6.6	0.069	3.01	10.41	10.76	104.1		
09:20	5	220	20.96	0.00	6.52	0.069	2.15	10.31	10.82	107.3		
09:25	5	220	20.96	0.00	6.47	0.069	0.51	10.18	10.71	109.8		
09:30	5	220	20.96	0.00	6.36	0.068	0.56	10.32	10.6	114.9		
09:35	5	220	20.96	0.00	6.31	0.068	2.22	10.28	10.89	115.4		
09:41	6	220	20.96	0.00	6.34	0.068	0.02	10.4	11.15	115.1		
09:45	4	220	20.96	0.00	6.32	0.068	2.32	10.53	11.05	116.2		
09:50	5	220	20.96	0.00	6.29	0.068	1.52	10.37	11.16	118.5		
09:55	5	220	20.96	0.00	6.26	0.068	2.12	10.48	11.41	119.6		
10:01	6	220	20.96	0.00	6.23	0.068	2.46	10.87	11.22	121.7		

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Location:	Landfill east	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-07-03			**Date**	5/15/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	16C, Sunny, Light Breeze
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	18.99	**Total Depth (ft-bmp)**	32.6	**Water Column(ft)**	14	**Gallons in Well**	2.21
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:15	**Volumes Purged**		**Sample ID**	SHM-07-03-SPR20	**Sampled by**	Desmond Bedard
Purge Start	13:45	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:45		160	18.99	0.00	5.69	0.391	289	9.93	14.5	338.7	None; clear	None
13:50	5	150	19.79	0.00	3.38	0.38	270	7.67	14.02	421.7	None; clear	None
13:55	5	150	19.91	0.00	3.62	0.376	238	6.26	13.52	399.7	None; clear	None
14:00	5	150	19.98	0.00	3.69	0.379	189	5.9	13.51	391.7	None; clear	None
14:05	5	150	19.98	0.00	4.53	0.41	134	5.45	14.01	320	None; clear	None
14:10	5	150	19.98	0.00	5.11	0.41	95.2	5.44	13.59	294.8	None; clear	None
14:15	5	150	19.98	0.00	5.23	0.418	72.6	5.43	13.68	288.9	None; clear	None
14:20	5	150	19.98	0.00	5.11	0.423	69.2	5.4	13.68	299.1	None; clear	None
14:25	5	150	19.98	0.00	5.44	0.424	55.2	5.47	13.53	283.6	None; clear	None
14:30	5	150	19.98	0.00	5.4	0.428	49.9	5.45	13.51	286.7	None; clear	None
14:35	5	150	19.98	0.00	5.49	0.435	33.5	5.48	13.61	281.2	None; clear	None
14:40	5	150	19.98	0.00	5.35	0.432	45.7	5.46	13.7	301.4	None; clear	None
14:45	5	150	19.98	0.00	5.41	0.434	27.6	5.51	13.78	291.9	None; clear	None
14:50	5	150	20	0.00	5.39	0.431	30.1	5.55	13.76	296.2	None; clear	None
14:55	5	150	20.03	0.00	5.57	0.434	22.1	5.56	13.66	299.2	None; clear	None
15:00	5	150	20.06	0.00	5.58	0.436	19.8	5.6	13.73	291.3	None; clear	None
15:05	5	150	20.08	0.00	5.59	0.438	18.9	5.59	13.72	291.6	None; clear	None
15:10	5	150	20.08	0.00	5.62	0.443	19.1	5.58	13.76	290.1	None; clear	None

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Constituent Sampled	Container	Number	Preservative
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Dangerous road; view block by curve and slope; medium tractor trailer traffic

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	no
Condition of Well:	Good; wells suction cap could use a replacement	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	nA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-2016-07B			**Date**	5/15/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, cloud
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21.42	**Total Depth (ft-bmp)**	80	**Water Column(ft)**	59	**Gallons in Well**	9.52
MP Elevation		**Pump Intake (ft-bmp)**	75	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:30	**Volumes Purged**		**Sample ID**	SHP-2016-07B-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	08:49	**Gallons Purged**					
Purge End	09:56			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:52		100	20.9	0.00	7.68	236	5.25	5.97	12.75	31.7	Clear	No
08:57	5	100	21.9	0.13	7.31	203	2.71	5.11	11.77	32.1	Clear	No
09:02	5	50	22.85	0.20	7.22	204	4.58	4.66	12.29	24.7	Clear	No
09:07	5	100	23.05	0.26	7.2	210	1.99	4.66	12.78	16.8	Clear	No
09:12	5	100	23.27	0.33	7.16	210	1.27	4.47	13.03	16.8	Clear	No
09:16	4	100	23.6	0.40	7.13	215	0.02	4.37	13.46	19	Clear	No
09:20	4	100	23.86	0.46	7.1	214	0.02	4.47	13.41	16.9	Clear	No
09:24	4	100	23.86	0.53	7.09	211	0.02	4.47	13.26	16.7	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Larger of two inner casings is B

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: SHL

Condition of Well: Good

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-2016-1A			**Date**	5/15/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	14.05	**Total Depth (ft-bmp)**	23	**Water Column(ft)**	9	**Gallons in Well**	0.36
MP Elevation		**Pump Intake (ft-bmp)**	18	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:00	**Volumes Purged**		**Sample ID**	SHP-2016-1A-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	11:03	**Gallons Purged**					
Purge End	12:30			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:04		100	14.06	0.00	5.53	43	18	8.94	12.16	21.5	Clear	No
11:09	5	100	14.06	0.26	5.94	32	65.4	10.53	11.91	83.3	Clear	No
11:14	5	100	14.09	0.53	5.77	43	63.8	10.75	11.34	107.2	Clear	No
11:19	5	100	14.09	0.53	5.69	43	40	10.73	11.55	123	Clear	No
11:24	5	100	14.1	0.53	5.61	42	14	10.52	11.98	140	Clear	No
11:29	5	100	14.1	0.66	5.59	42	6.7	10.63	11.45	154.7	Clear	No
11:34	5	100	14.1	0.79	5.59	42	4.41	10.49	11.47	160.7	Clear	No
11:39	5	100	14.1	0.79	5.58	42	4.98	10.52	11.37	164.2	Clear	No
11:43	4	100	14.1	0.92	5.59	43	0.02	10.54	11.5	182.9	Clear	No
11:47	4	100	14.1	1.06	5.62	42	0.02	10.67	11.51	180.3	Clear	No
11:52	5	100	14.1	1.19	5.59	43	2.37	10.53	11.47	189.6	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Cond units uS/cm

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: SHP

Well Locked at Arrival: no

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good	Well Locked at Departure:	no
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30048392	**Well ID**	SHP-2016-1B			**Date**	5/15/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	NA
Static Water Level (ft-bmp)	15.14	**Total Depth (ft-bmp)**	85	**Water Column(ft)**	70	**Gallons in Well**	11.35
MP Elevation		**Pump Intake (ft-bmp)**	80	**Purge Method**		**Sample Method**	
Sample Time	#Error	**Volumes Purged**		**Sample ID**	NA	**Sampled by**	Gabriel O'Connor
Purge Start	#Error	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	#Error						

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well:

Well Completion: NA

Well Locked at Arrival:

Well Locked at Departure:

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

ARCADIS Design & Consultancy for natural and built assets

Groundwater Gauging Log

Client:	USACE
Project Name/Location:	Devens, Massachusetts
Date(s):	5/18/2020
Sampler(s):	Desmond Bedard Gabriel O'Connor
Equipment:	water probe

Well	Date	Time	Depth to Water (ft)	Well Depth (ft)	Depth to LNAPL (ft)	PID (ppmv)	Remarks
SHL-10	5/18/2020	07:51:00	30.67	38.85	--	--	
PZ-12-09	5/18/2020	07:54:00	23.29	33.45	--	--	
PZ-12-10	5/18/2020	07:58:00	21.02	23.3	--	--	
SHL-19	5/18/2020	08:08:00	23.15	33.8	--	--	
PZ-12-07	5/18/2020	08:11:00	27.35	33.4	--	--	
PZ-12-08	5/18/2020	08:15:00	23.88	32.45	--	--	
SHL-4	5/18/2020	08:24:00	10.13	14.65	--	--	
PZ-12-05	5/18/2020	08:27:00	21.1	34.95	--	--	
PZ-12-06	5/18/2020	08:37:00	22.46	36.1	--	--	
SHM-11-02	5/18/2020	08:41:00	21.55	57.65	--	--	No PVC visible within steel casing; needs new lock (current on is too small to lock)
SHM-05-40X	5/18/2020	08:45:00	13.66	33.45	--	--	
SHM-07-05X	5/18/2020	08:51:00	2.75	64.73	--	--	
SHP-01-38A	5/18/2020	08:51:00	3.59	8.85	--	--	
SHL-11	5/18/2020	09:00:00	18.36	29.85	--	--	
SHL-20	5/18/2020	09:04:00	17.11	51.55	--	--	
PZ-12-03	5/18/2020	09:09:00	19.36	36.8	--	--	Lock needs replacement (too small to close)
PZ-12-04	5/18/2020	09:14:00	18.73	36.95	--	--	
SHM-13-07	5/18/2020	09:16:00	18.54	34.98	--	--	
PZ-12-01	5/18/2020	09:18:00	20.2	37.6	--	--	
PZ-12-02	5/18/2020	09:20:00	19.29	35.25	--	--	
SHM-13-03	5/18/2020	09:27:00	5.11	52.3	--	--	
SHP-01-37X	5/18/2020	09:29:00	3.29	10.25	--	--	
SHP-01-36X	5/18/2020	09:34:00	5.13	11	--	--	Lock missing

SHM-13-06	5/18/2020	09:39:00	17.07	45.53	--	--	
SHM-13-08	5/18/2020	09:51:00	20.06	64.93	--	--	
SHM-11-06	5/18/2020	09:55:00	18.97	35.8	--	--	
SHP-2016-07A	5/18/2020	10:05:00	14.91	31.8	--	--	
SHM-13-04	5/18/2020	10:08:00	18.54	29.82	--	--	
SHM-05-41B	5/18/2020	10:19:00	9.96	63.96	--	--	
SHM-05-41C	5/18/2020	10:22:00	10.31	87.35	--	--	
EPA-PZ-2012-2B	5/18/2020	10:27:00	9.98	14.9	--	--	
EPA-PZ-2012-2A	5/18/2020	10:31:00	9.94	27.9	--	--	
SHM-96-5B	5/18/2020	10:36:00	5.79	89.75	--	--	
SHP-2016-3B	5/18/2020	10:42:00	10.55	87.38	--	--	Well labeled SHP-PZ-16-03A/B.
EPA-PZ-2012-1B	5/18/2020	10:44:00	10.09	15.15	--	--	
EPA-PZ-2012-1A	5/18/2020	10:47:00	10.38	27.6	--	--	
EPA-PZ-2012-5A	5/18/2020	10:53:00	11.33	27.15	--	--	
SHP-2016-2B	5/18/2020	10:53:00	13.35	87.68	--	--	SHP-PZ-16-02A/B label
EPA-PZ-2012-5B	5/18/2020	10:57:00	6.63	12.6	--	--	
SHP-2016-06C	5/18/2020	11:15:00	19.74	132.95	--	--	
SHP-2016-4A	5/18/2020	11:17:00	17.41	32.57	--	--	
SHP-2017-02	5/18/2020	11:25:00	18.58	94.4	--	--	
SHP-2016-4B	5/18/2020	11:28:00	17.13	92.35	--	--	
SHP-2016-2A	5/18/2020	11:34:00	13.27	27.19	--	--	
EW-04	5/18/2020	11:43:00	44.38	102	--	--	Well vault is messy; wiring inhibits well cap from attaching properly; heavy garbage smell emanating from well; water table appears lower than at surrounding wells; probe covered in rust colored liquid during exit
SHP-2016-5B	5/18/2020	11:51:00	14.29	92.35	--	--	
SHP-2016-5A	5/18/2020	11:55:00	14.35	32.55	--	--	

SHP-2016-06A	5/18/2020	11:59:00	19.68	111.9	--	--	
SHP-2016-06B	5/18/2020	12:03:00	26.31	85.9	--	--	
SHP-2016-1A	5/18/2020	12:09:00	14.3	25.85	--	--	Well lock missing
SHM-93-22B	5/18/2020	12:18:00	6.67	94.15	--	--	
SHP-2016-1B	5/18/2020	12:21:00	16.19	85.9	--	--	Well lock missing
SHP-2016-3A	5/18/2020	12:24:00	10.81	27.28	--	--	
EPA-PZ-2012-3A	5/18/2020	12:29:00	9.81	26.68	--	--	
EPA-PZ-2012-3B	5/18/2020	12:33:00	9.68	76.76	--	--	
EPA-PZ-2012-4B	5/18/2020	12:39:00	13.85	76.73	--	--	
EW-01	5/18/2020	12:39:00	26.62	63.15	--	--	
EPA-PZ-2012-4A	5/18/2020	12:45:00	13.94	27.74	--	--	
SHP-2017-01	5/18/2020	12:47:00	17.62	79.15	--	--	
EPA-PZ-2012-6A	5/18/2020	12:59:00	21.49	33.06	--	--	
EPA-PZ-2012-6B	5/18/2020	13:04:00	21.39	27.72	--	--	
SHP-2016-07B	5/18/2020	14:23:00	21.74	80.65	--	--	
EPA-PZ-2012-7B	5/18/2020	14:24:00	21.37	64.3	--	--	
EPA-PZ-2012-7A	5/18/2020	14:32:00	21.32	29.12	--	--	
SHM-07-03	5/18/2020	15:40:00	19.03	32.57	--	--	

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	PZ-12-01			**Date**	5/18/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Overcast 59
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	20.2	**Total Depth (ft-bmp)**	34	**Water Column(ft)**	14	**Gallons in Well**	2.24
MP Elevation		**Pump Intake (ft-bmp)**	30	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:20	**Volumes Purged**		**Sample ID**	PZ-12-01 -SPR20	**Sampled by**	Diane Champagne
Purge Start	08:31	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	09:27						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:35		200	20.21	0.00	7.31	0.601	25.8	1.21	11.52	-3.1		
08:40	5	200	20.21	0.00	7.06	0.6	23.9	0.86	11.39	-5.5		
08:44	4	200	20.21	0.00	6.84	0.6	7.61	0.7	11.37	-5.6		
08:50	6	200	20.21	0.00	6.74	0.601	4.07	0.63	11.38	-5.2		
08:56	6	200	20.21	0.00	6.5	0.601	3.45	0.48	11.34	-3		
09:00	4	200	20.21	0.00	6.62	0.601	3.87	0.41	11.27	-3.4		
09:05	5	200	20.21	0.00	6.57	0.602	0.53	0.46	11.31	-2.9		
09:10	5	200	20.21	0.00	6.49	0.601	0.83	0.44	11.34	-0.4		
09:15	5	200	20.21	0.00	6.49	0.602	0.81	0.43	11.32	-1.4		

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Barrier wall

Condition of Well: Good

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	PZ-12-03			**Date**	5/18/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Overcast 59
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	19.46	**Total Depth (ft-bmp)**	36.8	**Water Column(ft)**	17	**Gallons in Well**	2.82
MP Elevation		**Pump Intake (ft-bmp)**	33	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:25	**Volumes Purged**		**Sample ID**	PZ-12-03 -Spr20	**Sampled by**	Diane Champagne
Purge Start	#Error	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	12:40						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:49		200	19.46	0.00	6.28	0.002	81	0.95	12.4	45.1	Pale orange	No
11:56	7	200	19.47	0.00	6.38	0.575	61.8	0.86	11.85	30	Pale orange	No
12:00	4	200	19.46	0.00	6.22	0.576	44.4	0.42	11.72	30.7	Pale orange	No
12:06	6	200	19.46	0.00	6.23	0.575	41.5	0.35	11.82	22.7	Pale orange	No
12:10	4	200	19.46	0.00	6.25	0.575	40.7	0.33	11.92	18.1	Pale orange	No
12:16	6	200	19.46	0.00	6.26	0.575	39.9	0.31	12.03	13.7	Pale orange	No
12:21	5	200	19.46	0.00	6.29	0.574	39.2	0.32	12.22	9.8	Pale orange	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Barrier wall

Condition of Well: Good

Well Completion: Stick-up

Well Locked at Arrival: no

Well Locked at Departure: no

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	PZ-12-04			**Date**	5/18/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Overcast 59
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	18.8	**Total Depth (ft-bmp)**	36.8	**Water Column(ft)**	18	**Gallons in Well**	2.92
MP Elevation		**Pump Intake (ft-bmp)**	33	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:20	**Volumes Purged**		**Sample ID**	PZ-12-04 -SPR20	**Sampled by**	Diane Champagne
Purge Start	12:44	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	13:32						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:45		200	18.8	0.00	6.17	0.582	23.8	1.45	12.72	45.7	Pale orange	No
12:51	6	200	18.78	0.00	6.01	0.585	22.6	0.54	12.4	43.4	Pale orange	No
12:55	4	200	18.8	0.00	5.97	0.585	13.5	0.44	12.28	40.4	Pale orange	No
13:00	5	200	18.78	0.00	6.08	0.581	8.3	0.4	12.49	30.1	Pale orange	No
13:05	5	200	18.78	0.00	6.06	0.574	8.53	0.35	12.44	27.1	Pale orange	No
13:11	6	200	18.78	0.00	6.05	0.576	8.96	0.33	12.55	22.8	Pale orange	No
13:14	3	200	18.78	0.00	6.1	0.585	7.99	0.32	12.61	17.9	Pale orange	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Barrier wall

Condition of Well: Good

Well Completion: Stick-up

Well Locked at Arrival: no

Well Locked at Departure: no

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	PZ-12-05			**Date**	5/18/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 74
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	20.41	**Total Depth (ft-bmp)**	36	**Water Column(ft)**	16	**Gallons in Well**	2.53
MP Elevation		**Pump Intake (ft-bmp)**	34	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	16:15	**Volumes Purged**		**Sample ID**	PZ-12-05 -SPR20	**Sampled by**	Diane Champagne
Purge Start	15:35	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	16:28						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:39		200	21.4	0.00	6.07	0.175	6.73	1.41	13.33	59.2	Pale orange	No
15:44	5	200	21.41	0.00	5.99	0.171	5.61	0.58	13.42	59.9	Pale orange	No
15:49	5	200	21.41	0.00	6.07	0.169	5.84	0.46	13.67	49.9	Pale orange	No
15:54	5	200	21.41	0.00	6.11	0.17	5.74	0.42	13.44	52.7	Pale orange	No
15:59	5	200	21.41	0.00	6.04	0.167	5.55	0.39	13.5	48.8	Pale orange	No
16:02	3	200	21.41	0.00	6.01	0.168	5.26	0.36	13.42	50.1	Pale orange	No
16:06	4	200	21.4	0.00	6.08	0.168	5.11	0.35	13.74	44	Pale orange	No
16:12	6	200	21.4	0.00	6.08	0.166	5.31	0.34	13.61	46.7	Pale orange	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Barrier wall

Condition of Well: Good

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	PZ-12-06			**Date**	5/18/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Overcast 59
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	22.41	**Total Depth (ft-bmp)**	35	**Water Column(ft)**	13	**Gallons in Well**	2.05
MP Elevation		**Pump Intake (ft-bmp)**	33	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:00	**Volumes Purged**		**Sample ID**	PZ-12-06-SPR20	**Sampled by**	Diane Champagne
Purge Start	13:45	**Gallons Purged**		**Replicate/ Code No.**	SHL-Dup02-SPR20		
Purge End	15:13						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:45		200	22.51	0.00	5.97	0.285	41.1	0.86	12.05	70.7	Pale orange	No
13:50	5	200	22.51	0.00	5.73	0.284	25.4	0.6	12.03	75.2	Pale orange	No
13:55	5	200	22.51	0.00	5.66	0.287	20.1	0.5	11.94	74.7	Pale orange	No
14:00	5	200	22.51	0.00	5.66	0.289	12.1	0.48	11.73	71.2	Pale orange	No
14:15	15	200	22.51	0.00	5.63	0.289	12.1	0.3	11.8	69.9	Pale orange	No
14:21	6	200	22.51	0.00	5.62	0.289	8.8	0.3	11.93	69.9	Pale orange	No
14:25	4	200	22.51	0.00	5.65	0.291	9.99	0.29	11.78	69.1	Pale orange	No
14:30	5	200	22.51	0.00	5.63	0.291	8.8	0.28	11.9	68.1	Pale orange	No
14:36	6	200	22.51	0.00	5.58	0.291	8.91	0.29	11.74	69.4	Pale orange	No
14:41	5	200	22.51	0.00	5.55	0.29	7.24	0.28	11.98	70.3	Pale orange	No
14:45	4	200	22.51	0.00	5.54	0.289	8.9	0.28	11.86	71.4	Pale orange	No
14:49	4	200	22.51	0.00	5.52	0.288	8.01	0.28	11.94	71.7	Pale orange	No
14:55	6	200	22.51	0.00	5.52	0.289	8.55	0.27	12.08	70.6	Pale orange	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: I didn't realize the duplicate numbers were preassigned and did the duplicate on SHL-20 as DUP01. The duplicate for this well is DUP02

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHL-11			**Date**	5/18/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Overcast 59
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	18.4	**Total Depth (ft-bmp)**	29.8	**Water Column(ft)**	11	**Gallons in Well**	1.85
MP Elevation		**Pump Intake (ft-bmp)**	24	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:25	**Volumes Purged**		**Sample ID**	Shl-11-Spr-20	**Sampled by**	Diane Champagne
Purge Start	10:53	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	11:35						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:56		200	18.4	0.00	6.32	0.637	27.3	1.07	12.21	43.3	Pale yellow	
11:00	4	200	18.4	0.00	6.26	0.637	15.4	0.5	12.16	36.8	Pale yellow	
11:05	5	200	18.4	0.00	6.28	0.636	10.3	0.39	12.07	27.1	Pale yellow	
11:11	6	200	18.4	0.00	6.27	0.635	13.4	0.35	11.96	19.2	Pale yellow	
11:15	4	200	18.4	0.00	6.29	0.636	13.8	0.33	11.99	14.1	Pale yellow	
11:20	5	200	18.4	0.00	6.3	0.637	14.1	0.32	12.01	9.3	Pale yellow	

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Barrier wall

Condition of Well: Good

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHL-20			**Date**	5/18/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Overcast 59
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	17.15	**Total Depth (ft-bmp)**	50.1	**Water Column(ft)**	33	**Gallons in Well**	21.42
MP Elevation		**Pump Intake (ft-bmp)**	46	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:20	**Volumes Purged**		**Sample ID**	SHL-20-SPR20	**Sampled by**	Diane Champagne
Purge Start	09:35	**Gallons Purged**		**Replicate/ Code No.**	She-dup01-spr20		
Purge End	10:37						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:40		200	20.21	0.00	6.57	0.51	20.8	1.07	11.58	28.7	No	No
09:49	9	200	20.21	0.00	6.5	0.509	18.8	0.65	11.45	24.6	No	No
09:51	2	200	20.21	0.00	6.51	0.51	21.3	0.58	11.57	20.6	No	No
09:57	6	200	20.21	0.00	6.5	0.511	18.2	0.47	11.47	15.7	No	No
10:01	4	200	20.21	0.00	6.52	0.511	17.7	0.44	11.49	12.2	No	No
10:05	4	200	20.21	0.00	6.54	0.511	18.2	0.42	11.53	8.1	No	No
10:14	9	200	20.21	0.00	6.54	0.511	17.6	0.4	11.73	3.4	No	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-07-05X			**Date**	5/18/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	16C, Sunny, Light Breeze
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	3.77	**Total Depth (ft-bmp)**	64.75	**Water Column(ft)**	61	**Gallons in Well**	9.91
MP Elevation		**Pump Intake (ft-bmp)**	59.75	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	16:20	**Volumes Purged**		**Sample ID**	SHM-07-05X-SPR20	**Sampled by**	Desmond Bedard
Purge Start	15:25	**Gallons Purged**					
Purge End	16:43			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:25		200	3.77	0.00	6.76	0.183	137	2.02	12.44	258	Light brown	No
15:30	5	200	4.85	0.00	5.71	0.181	127	1.65	12.09	279.9	Light brown	No
15:35	5	180	7.63	0.00	5.73	0.182	139	1.23	12.72	247.8	Light brown	No
15:40	5	150	8.23	0.00	6.2	0.181	121	1.19	12.11	229.6	Light brown	No
15:45	5	100	9.65	0.00	5.79	0.181	107	1.04	12.27	246.1	Light brown	No
15:50	5	100	10.82	0.00	6.09	0.184	109	1.02	12.73	208.3	Light brown	No
15:54	4	100	11.04	0.00	6.48	0.185	106	0.98	12.65	207.4	Light brown	No
15:59	5	100	12.02	0.00	6.68	0.188	129	1	12.46	195.3	Light brown	No
16:02	3	100	12.66	0.00	6.59	0.184	108	0.99	12.66	198.9	Light brown	No
16:06	4	100	13.63	0.00	6.24	0.183	111	0.96	12.54	220	Light brown	No
16:10	4	100	14.09	0.00	6.19	0.186	109	0.94	12.73	222.8	Light brown	No
16:15	5	100	13.75	0.00	6.27	0.188	119	0.92	12.84	216.1	Light brown	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Information

Well Location:		Well Locked at Arrival:	no
Condition of Well:	Good	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EW-01			**Date**	5/18/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**		**Well Casing Material**	NA
Static Water Level (ft-bmp)	26.62	**Total Depth (ft-bmp)**	63.15	**Water Column(ft)**	37	**Gallons in Well**	
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Grab	**Sample Method**	Low-Flow
Sample Time	14:00	**Volumes Purged**		**Sample ID**	EW-01-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	#Error	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	#Error						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:00		100	14.1	0.00	6.62	569	40	9.26	11.79	-43.3	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well:

Well Completion: NA

Well Locked at Arrival:

Well Locked at Departure:

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EW-04			**Date**	5/18/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**		**Well Casing Material**	NA
Static Water Level (ft-bmp)	44.38	**Total Depth (ft-bmp)**	102	**Water Column(ft)**	58	**Gallons in Well**	
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Grab	**Sample Method**	Low-Flow
Sample Time	13:40	**Volumes Purged**		**Sample ID**	EW-04-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	#Error	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	#Error						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:49		100	14.1	0.00	7.73	317	39.3	9.54	11.92	-65.3	Light brown	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well:

Well Completion: NA

Well Locked at Arrival:

Well Locked at Departure:

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EPA-PZ-2012-1A			**Date**	5/19/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.32	**Total Depth (ft-bmp)**	27.6	**Water Column(ft)**	17	**Gallons in Well**	0.7
MP Elevation		**Pump Intake (ft-bmp)**	22.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:30	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-1A-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	12:35	**Gallons Purged**					
Purge End	01:42			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:35		100	10.49	0.13	6.25	0.127	40.5	4.8	11.01	63.8	Clear	No
12:40	5	100	10.5	0.26	6	0.123	40.1	4.26	10.6	78	Clear	No
12:45	5	100	10.5	0.40	5.96	0.127	23.6	3.94	10.49	90.7	Clear	No
12:50	5	100	10.51	0.53	5.98	0.129	10.1	3.91	10.28	93.4	Clear	No
12:55	5	100	10.51	0.66	6.01	0.109	6.24	3.9	10.1	94.9	Clear	No
13:00	5	100	10.51	0.79	6.01	124	6.33	3.9	9.7	95.1	Clear	No
13:05	5	100	10.51	0.92	6.02	0.125	6.81	3.8	9.8	95.2	Clear	No
13:10	5	100	10.51	1.06	6.03	0.124	14.6	3.77	9.82	97	Clear	No
13:15	5	100	10.51	1.19	6.05	0.122	4.22	3.8	9.49	97.6	Clear	No
13:19	4	100	10.51	1.32	6.06	0.123	3.47	3.8	9.38	98.4	Clear	No
13:24	5	100	10.51	1.32	6.06	0.122	3.04	4.1	9.42	91.5	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: SHP

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EPA-PZ-2012-1B			**Date**	5/19/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.14	**Total Depth (ft-bmp)**	77.24	**Water Column(ft)**	67	**Gallons in Well**	2.73
MP Elevation		**Pump Intake (ft-bmp)**	72	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:35	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-1B-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	13:53	**Gallons Purged**					
Purge End	15:46			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:53		100	10.21	0.13	6.28	0.411	31.4	2.87	11.46	-15	Clear	No
13:57	4	100	10.15	0.26	6.35	0.466	42	2.28	11.52	-25.5	Clear	No
14:02	5	100	10.15	0.00	6.35	0.466	50.5	2.22	11.56	-31.7	Clear	No
14:07	5	100	10.15	0.53	6.35	0.469	59.7	2.33	11.34	-35	Clear	No
14:12	5	100	10.15	0.00	6.34	0.468	58.6	2.25	11.26	-36.7	Clear	No
14:17	5	100	10.15	0.79	6.31	0.488	61.3	2.3	11.41	-49.6	Clear	No
14:20	3	100	10.15	0.92	6.32	0.492	48.6	2.29	11.59	-52.3	Clear	No
14:25	5	100	10.15	0.00	6.33	0.49	39.8	2.28	11.28	-53	Clear	No
14:30	5	100	10.15	0.00	6.39	0.488	29.3	2.3	11.14	-53.6	Clear	No
14:35	5	100	10.15	0.00	6.42	0.493	21.7	2.24	11.19	-54.1	Clear	No
14:40	5	100	10.15	0.00	6.41	0.493	14	2.27	11.26	-54.4	Clear	No
14:45	5	100	10.15	0.00	6.37	0.494	12.9	2.32	11.27	-54.2	Clear	No
14:50	5	100	10.15	0.00	6.32	0.493	10.3	2.32	11.68	-54.2	Clear	No
14:55	5	100	10.15	0.00	6.46	0.495	8.7	2.46	11.84	55.3	Clear	No
14:00	1385	100	10.15	0.00	6.33	0.496	6.3	2.33	11.85	-54.6	Clear	No
15:05	65	100	10.15	0.00	6.32	0.494	4.11	2.35	11.9	-53.7	Clear	No
15:10	5	100	10.15	0.00	6.28	0.492	4.94	2.31	11.72	-52.9	Clear	No
15:15	5	100	10.15	0.00	6.31	0.496	3.08	2.3	11.8	-52.5	Clear	No

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Constituent Sampled	Container	Number	Preservative
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well:

Well Completion: NA

Well Locked at Arrival:

Well Locked at Departure:

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EPA-PZ-2012-2A			**Date**	5/19/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	18c, Sunny, Medium Breeze
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.93	**Total Depth (ft-bmp)**	27.9	**Water Column(ft)**	18	**Gallons in Well**	0.73
MP Elevation		**Pump Intake (ft-bmp)**	22.9	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:25	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-2A-SPR20	**Sampled by**	Desmond Bedard
Purge Start	14:30	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:30		130	9.93	0.00	8.65	0.054	1.56	7.21	11.2	154.8	None; clear	None
14:35	725	120	9.99	0.00	5.05	0.043	1.99	4.11	11.01	371.8	None; clear	None
14:40	5	120	9.99	0.00	5.07	0.044	2.14	3.74	11.99	348.5	None; clear	None
14:45	5	120	9.99	0.00	4.85	0.043	1.99	3.63	11.92	382.4	None; clear	None
14:50	5	120	9.99	0.00	5.25	0.042	1.16	3.68	12.02	361.8	None; clear	None
14:55	5	120	9.99	0.00	5.34	0.042	0.5	3.56	12.08	357	None; clear	None
15:00	5	120	9.99	0.00	4.25	0.041	0.24	3.64	12.09	415.7	None; clear	None
15:05	5	120	9.99	0.00	4.26	0.041	0.26	3.57	12	417.9	None; clear	None
15:10	5	120	9.99	0.00	4.41	0.04	0.22	3.64	11.94	418.7	None; clear	None
15:15	5	120	9.99	0.00	4.45	0.04	0.25	3.61	12.07	414.2	None; clear	None
15:20	5	120	9.99	0.00	4.47	0.04	0.22	3.61	12.05	409.9	None; clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Used tubing found in well for low flow sampling

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: In woods North East East of EW

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

treatment building

Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	EPA Key

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EPA-PZ-2012-4A			**Date**	5/19/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.89	**Total Depth (ft-bmp)**	27.74	**Water Column(ft)**	14	**Gallons in Well**	0.56
MP Elevation		**Pump Intake (ft-bmp)**	22	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:15	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-4A-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	09:34	**Gallons Purged**					
Purge End	10:32			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:38		100	14.03	0.13	6.59	0.24	13.3	6.05	13.55	-11.3	Clear	No
09:43	5	100	14.03	0.26	6.44	0.272	4.8	4.19	13.06	-24.3	Clear	No
09:47	4	100	14.03	0.40	6.44	0.276	1.35	4.01	13.17	-32.8	Clear	No
09:50	3	100	14.03	0.53	6.44	0.282	1.83	3.95	13.25	-37.9	Clear	No
09:55	5	100	14.03	0.66	6.45	0.281	0.02	3.9	13.15	-44.1	Clear	No
10:00	5	100	14.03	0.79	6.44	0.282	0.02	3.9	13.12	-48.3	Clear	No
10:05	5	100	14.03	0.92	6.45	0.279	0.02	3.84	13.09	-52.6	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: SHP

Condition of Well: Good

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EPA-PZ-2012-4B			**Date**	5/19/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.91	**Total Depth (ft-bmp)**	76.73	**Water Column(ft)**	63	**Gallons in Well**	2.55
MP Elevation		**Pump Intake (ft-bmp)**	71	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:30	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-04B-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	10:52	**Gallons Purged**					
Purge End	11:50			**Replicate/ Code No.**	SHL-DUP05-SPR20		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:57		100	13.75	0.13	6.64	0.49	41.8	6.87	16.75	-70.3	Clear	No
11:02	5	100	13.75	0.26	6.7	0.513	8.39	4.26	15.61	-96.8	Clear	No
11:05	3	100	13.93	0.53	6.69	0.507	0.61	4.06	15.31	-99.4	Clear	No
11:10	5	100	13.93	0.53	6.7	0.501	0.02	4.11	14.66	-101.5	Clear	No
11:15	5	100	13.93	0.79	6.7	0.502	0.02	3.98	14.61	-102.8	Clear	No
11:20	5	100	13.93	0.92	6.69	0.505	0.02	3.86	14.6	-104.2	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: SHL

Condition of Well: Good

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	PZ-12-08			**Date**	5/19/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 74
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	23.95	**Total Depth (ft-bmp)**	32	**Water Column(ft)**	8	**Gallons in Well**	1.31
MP Elevation		**Pump Intake (ft-bmp)**	30	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:05	**Volumes Purged**		**Sample ID**	PZ-12-08 -SPR20	**Sampled by**	Diane Champagne
Purge Start	08:36	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	10:13						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:36		200	23.97	0.00	6.36	0.155	421	0.53	9.91	93.6	Orange	No
08:41	5	200	23.97	0.00	6.29	0.155	165	0.48	10.04	93	Orange	No
08:45	4	200	23.97	0.00	6.27	0.155	155	0.52	9.96	93.1	Orange	No
08:50	5	200	23.97	0.00	6.22	0.154	141	0.52	10.03	93.3	Orange	No
09:02	12	200	23.97	0.00	6.16	0.156	74.6	0.55	10.12	93.8	Orange	No
09:07	5	200	23.97	0.00	6.15	0.149	64.3	0.89	10.36	92.5	Orange	No
09:10	3	200	23.97	0.00	6.15	0.147	55.5	1.29	10.38	93.1	Orange	No
09:18	8	200	23.97	0.00	6.14	0.136	42.1	2.42	10.4	93.4	Orange	No
09:24	6	200	23.97	0.00	6.11	0.13	40.1	3.87	10.47	96.4	Orange	No
09:30	6	200	23.97	0.00	6.1	0.127	24.8	3.88	10.54	97.7	Orange	No
09:36	6	200	23.97	0.00	6.13	0.139	20.1	5.12	10.53	96.3	Orange	No
09:40	4	200	23.97	0.00	6.09	0.129	20.6	4.85	10.69	98	Orange	No
09:45	5	200	23.97	0.00	6.06	0.123	18.9	5	10.72	99.1	Orange	No
09:50	5	200	23.97	0.00	6.06	0.127	19.4	5.1	10.63	99.2	Orange	No
09:55	5	200	23.97	0.00	6.04	0.128	19.6	5.11	10.64	101.1	Orange	No
10:00	5	200	23.97	0.00	6.06	0.127	18.9	4.9	10.71	99.7	Orange	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Comments:

Well Casing Volume Conversion

Well diameter (inches)	1 = 0.04	1.5 = 0.09	2.5 = 0.26	3.5 = 0.50	6 = 1.47
= gallons per foot	1.25 = 0.06	2 = 0.16	3 = 0.37	4 = 0.65	

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	no
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2006

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHL-10			**Date**	5/19/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 63
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	30.36	**Total Depth (ft-bmp)**	38.8	**Water Column(ft)**	8	**Gallons in Well**	1.37
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:05	**Volumes Purged**		**Sample ID**	SHL-10-spr20	**Sampled by**	Diane Champagne
Purge Start	12:39	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	14:25						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:40		200	30.47	0.00	6.29	0.031	24.1	10.68	13.62	166.7	No	
12:45	5	200	30.47	0.00	5.67	0.017	27.3	10.39	13.65	187.8	No	
12:50	5	200	30.47	0.00	5.6	0.018	14.2	10.79	13.79	182.8	No	
12:55	5	200	30.47	0.00	5.64	0.02	13.9	10.28	13.25	171.2	No	
12:59	4	200	30.47	0.00	5.53	0.02	13.1	10.74	13.89	165	No	
13:04	5	200	30.47	0.00	5.81	0.021	13	9.59	13.09	151	No	
13:10	6	200	30.47	0.00	5.94	0.021	8.16	10.6	13.8	142.1	No	
13:15	5	200	30.47	0.00	5.89	0.021	7.48	10.28	13.96	145.2	No	
13:19	4	200	30.47	0.00	5.78	0.021	3.3	9.79	13.15	150.5	No	
13:25	6	200	30.47	0.00	5.65	0.022	3.56	9.85	13.58	160.2	No	
13:30	5	200	30.47	0.00	5.77	0.022	3.41	9.78	13.9	155.4	No	
13:35	5	200	30.47	0.00	5.77	0.022	2.85	9.89	13.51	157.5	No	
13:40	5	200	30.47	0.00	5.64	0.022	2.81	9.63	13.47	166.1	No	
13:45	5	200	30.47	0.00	5.54	0.022	3.65	9.78	13.71	167.4	No	
13:50	5	200	30.47	0.00	5.82	0.022	3.33	9.34	13.68	157.7	No	
13:55	5	200	30.47	0.00	5.76	0.022	3.65	10.22	13.65	161.8	No	
14:00	5	200	30.47	0.00	5.79	0.022	3.5	9.55	13.48	163.6	No	

Constituent Sampled	**Container**	**Number**	**Preservative**

Comments:

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Casing Volume Conversion

Well diameter (inches)	1 = 0.04	1.5 = 0.09	2.5 = 0.26	3.5 = 0.50	6 = 1.47
= gallons per foot	1.25 = 0.06	2 = 0.16	3 = 0.37	4 = 0.65	

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHL-19			**Date**	5/19/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 68
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	22.3	**Total Depth (ft-bmp)**	30	**Water Column(ft)**	8	**Gallons in Well**	5
MP Elevation		**Pump Intake (ft-bmp)**	27.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:00	**Volumes Purged**		**Sample ID**	SHL-19	**Sampled by**	Diane Champagne
Purge Start	10:39	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	12:13						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:40		200	23.2	0.00	6.49	0.059	61.2	10.04	12.64	104.9	Orange	No
10:45	5	200	23.21	0.00	6.41	0.058	55.7	10.11	12.62	106.08	Orange	No
10:50	5	200	23.3	0.00	6.38	0.057	71.3	10.08	12.73	107.05	Orange	No
10:55	5	200	23.2	0.00	6.34	0.058	67.3	9.96	12.83	107.1	Orange	No
11:00	5	200	23.21	0.00	6.46	0.057	37.3	10.08	12.53	104.1	Orange	No
11:06	6	200	23.21	0.00	6.42	0.057	57.3	10.88	12.67	107.7	Orange	No
11:11	5	200	23.2	0.00	6.43	0.057	44.4	10.7	0.057	107.9	Orange	No
11:15	4	200	23.2	0.00	6.46	0.057	53.7	10.64	13.38	108.3	Orange	No
11:20	5	200	23.21	0.00	6.48	0.057	53.7	10.59	13.41	107.6	Orange	No
11:25	5	200	23.21	0.00	6.49	0.057	23.1	10.55	13.85	108.07	Orange	No
11:30	5	200	23.21	0.00	6.48	0.057	21.9	10.8	13.32	112.3	Orange	No
11:36	6	200	23.21	0.00	6.41	0.057	19.4	10.54	13.47	113.8	Orange	No
11:40	4	200	23.21	0.00	6.5	0.057	18.5	10.95	13.32	109.1	Orange	No
11:45	5	200	23.21	0.00	6.47	0.057	8.43	10.95	13.32	109.8	Orange	No
11:50	5	200	23.21	0.00	6.42	0.057	8.73	10.62	13.41	114.5	Orange	No
11:55	5	200	23.21	0.00	6.45	0.056	7.99	10.3	13.25	111.6	Orange	No

Constituent Sampled	Container	Number	Preservative
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot	1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3537

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-05-40X			**Date**	5/19/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	13C, Sunny, Medium Breeze
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.7	**Total Depth (ft-bmp)**	33.55	**Water Column(ft)**	20	**Gallons in Well**	3.23
MP Elevation		**Pump Intake (ft-bmp)**	28.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:15	**Volumes Purged**		**Sample ID**	SHM-05-40X-SPR20	**Sampled by**	Desmond Bedard
Purge Start	10:05	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**	SHL-DUP06-SPR20		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:05		180	13.7	0.00	6.81	0.368	122	3.77	12.79	100.3	None; clear	None
10:10	5	150	13.83	0.00	5.19	0.337	112	1.13	13.82	126.6	None; clear	None
10:15	5	120	13.81	0.00	6.14	0.344	50.9	1.11	13.55	76.7	None; clear	None
10:20	5	120	13.8	0.00	6.31	0.348	43.2	0.91	13.65	60.5	None; clear	None
10:25	5	120	13.8	0.00	6.38	0.36	30.6	0.73	13.59	55.9	None; clear	None
10:30	5	120	13.8	0.00	6.38	0.354	50.4	0.71	13.72	53.1	None; clear	None
10:35	5	120	13.8	0.00	6.43	0.353	29.4	0.64	13.76	47.1	None; clear	None
10:40	5	120	13.8	0.00	6.54	0.35	21.8	0.63	13.88	40.9	None; clear	None
10:45	5	120	13.8	0.00	6.71	0.348	26.6	0.41	13.51	41.5	None; clear	None
10:50	5	120	13.8	0.00	5.95	0.342	11.8	0.29	13.59	78.2	None; clear	None
10:55	5	120	13.8	0.00	6.18	0.341	12.1	0.28	13.48	46.5	None; clear	None
11:00	5	120	13.8	0.00	6.44	0.338	11.3	0.27	13.55	45.4	None; clear	None
11:05	5	120	13.8	0.00	6.37	0.338	11.3	0.25	13.56	46.9	None; clear	None
11:10	5	120	13.8	0.00	6.43	0.333	12	0.26	13.49	44.4	None; clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: One bolt on cover flush with asphalt is missing; used tubing found in well for sampling

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot	1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	no
Condition of Well:	Good; except for missing bolt as described in notes	Well Locked at Departure:	
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-11-02			**Date**	5/19/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 68
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	Open
Static Water Level (ft-bmp)	20.75	**Total Depth (ft-bmp)**	66	**Water Column(ft)**	45	**Gallons in Well**	29.41
MP Elevation		**Pump Intake (ft-bmp)**	60	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:50	**Volumes Purged**		**Sample ID**	SHM-11-02-Spr20	**Sampled by**	Diane Champagne
Purge Start	#Error	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	16:09						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:35		300	22.65	0.00	6.54	0.325	22.1	0.88	13.24	-34.7	None	No
14:40	5	300	22.71	0.00	6.74	0.31	23.4	0.6	14.07	-76.9	None	No
14:46	6	300	22.8	0.00	7.03	0.312	24.7	0.57	14.11	-96.5	None	No
14:50	4	160	22.9	0.00	7.04	0.319	20.1	0.49	13.95	-107.2	None	No
14:55	5	160	23	0.00	7.03	0.328	22.2	0.51	14.23	-123.8	None	No
15:00	5	160	23.45	0.00	7.1	0.339	23.6	0.42	13.92	-132.2	None	No
15:05	5	300	23.72	0.00	7.08	0.351	20.1	0.39	14.09	-132	None	No
15:10	5	300	23.7	0.00	7.11	0.357	20.8	0.37	14.07	-134.4	None	No
15:16	6	300	23.89	0.00	7.15	0.376	15.9	0.37	14.15	-140.8	None	No
15:20	4	300	23.9	0.00	7.11	0.4	9.96	0.36	14.16	-140.1	None	No
15:25	5	300	24.15	0.00	7.08	0.43	9.71	0.36	14.11	-141.1	None	No
15:30	5	300	24.4	0.00	7.04	0.473	8.96	0.38	14.22	-139	None	No
15:35	5	300	24.62	0.00	7.01	0.516	8.83	0.4	14.24	-135	None	No
15:40	5	300	24.99	0.00	6.99	0.518	8.14	0.39	14.2	-132.9	None	No
15:45	5	300	24.99	0.00	6.96	0.526	8.29	0.39	14.11	-130.6	None	No

Constituent Sampled	Container	Number	Preservative
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Comments:

Well Casing Volume Conversion

Well diameter (inches)	1 = 0.04	1.5 = 0.09	2.5 = 0.26	3.5 = 0.50	6 = 1.47
= gallons per foot	1.25 = 0.06	2 = 0.16	3 = 0.37	4 = 0.65	

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	no
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2006

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-13-06			**Date**	5/19/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	10C, Sunny, Light Breeze
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	17.13	**Total Depth (ft-bmp)**	46.2	**Water Column(ft)**	29	**Gallons in Well**	4.72
MP Elevation		**Pump Intake (ft-bmp)**	40	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	08:55	**Volumes Purged**		**Sample ID**	SHM-13-06-SPR20	**Sampled by**	Desmond Bedard
Purge Start	08:10	**Gallons Purged**					
Purge End	08:55			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:10		160	17.13	0.00	7.35	0.364	24.2	10.7	13.21	130.1	None; clear	None
08:15	5	160	17.16	0.00	7.07	0.336	26.1	2.9	11.53	73.8	None; clear	None
08:20	5	120	17.15	0.00	6.47	0.338	60.5	0.84	11.85	57.9	None; clear	None
08:25	5	120	17.15	0.00	6.64	367	39.2	0.82	11.03	32.9	None; clear	None
08:30	5	120	17.15	0.00	6.67	0.374	35.9	0.75	11.22	28	None; clear	None
08:35	5	120	17.15	0.00	6.69	0.391	32	0.62	11.45	24.7	None; clear	None
08:40	5	120	17.15	0.00	6.66	0.397	29.8	0.56	11.52	25.2	None; clear	None
08:45	5	120	17.15	0.00	6.69	0.401	28.8	0.53	11.48	23.9	None; clear	None
08:50	5	120	17.15	0.00	6.7	0.402	29.2	0.53	11.51	22.3	None; clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Used tubing found in well for sampling

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Off of West Main Street (North)

Condition of Well: Good

Well Completion: Flush mount

Well Locked at Arrival: no

Well Locked at Departure:

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-96-5B			**Date**	5/19/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	18c, Sunny, Medium Breeze
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.86	**Total Depth (ft-bmp)**	89.75	**Water Column(ft)**	84	**Gallons in Well**	13.63
MP Elevation		**Pump Intake (ft-bmp)**	28	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:40	**Volumes Purged**		**Sample ID**	SHM-96-5B-SPR20	**Sampled by**	Desmond Bedard
Purge Start	12:45	**Gallons Purged**					
Purge End	13:40			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:45		150	5.86	0.00	7.29	0.489	31.2	8.66	12.27	164.1	None; clear	None
12:50	5	150	5.99	0.00	4.56	0.447	36.3	2.76	11.24	218.7	None; clear	None
12:55	5	150	6.01	0.00	4.58	0.453	29.9	1.43	11.24	193.7	None; clear	None
13:00	5	150	6.01	0.00	5.15	0.456	32	0.79	11.28	158.7	None; clear	None
13:05	5	120	6.01	0.00	5.33	0.463	39.3	0.75	11.15	145.9	None; clear	None
13:10	5	120	5.97	0.00	6.36	0.471	28.4	0.62	11.51	92.2	None; clear	None
13:15	5	120	5.97	0.00	6.37	0.474	28.9	0.56	11.46	91	None; clear	None
13:20	5	120	5.97	0.00	6.42	0.479	21.6	0.52	11.73	87.5	None; clear	None
13:25	5	120	5.97	0.00	6.44	0.481	20.9	0.5	11.27	87.4	None; clear	None
13:30	5	120	5.97	0.00	6.43	0.484	21.7	0.5	11.23	86.2	None; clear	None
13:35	5	120	5.97	0.00	6.47	0.491	21.4	0.5	11.33	82.6	None; clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Used tubing found in well for sampling

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: North of SHL EW building in woods

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EPA-PZ-2012-2B			**Date**	5/20/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.04	**Total Depth (ft-bmp)**	83.35	**Water Column(ft)**	73	**Gallons in Well**	2.98
MP Elevation		**Pump Intake (ft-bmp)**	78	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:05	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-2B-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	08:00	**Gallons Purged**					
Purge End	09:30			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:00		100	10.15	0.13	7.97	0.224	36.4	9.34	10.03	109.2	Clear	No
08:05	5	100	10.15	0.26	6.54	0.278	8.33	4.87	8.91	109.4	Clear	No
08:10	5	100	10.15	0.40	6.36	0.279	11.9	4.44	9.06	114.3	Clear	No
08:15	5	100	10.15	0.53	6.29	0.28	36.8	3.9	9.16	119	Clear	No
08:20	5	100	10.15	0.66	6.28	0.28	54.7	4.17	9.25	118.9	Clear	No
08:25	5	100	10.15	0.79	6.28	0.294	81.2	3.94	9.35	50.1	Clear	No
08:30	5	100	10.15	0.00	6.28	0.294	56.4	3.93	9.37	48.2	Clear	No
08:35	5	100	10.15	0.92	6.28	0.296	46.6	3.9	9.46	46.1	Clear	No
08:39	4	100	10.15	1.06	6.28	0.295	42.7	3.84	9.56	46.5	Clear	No
08:45	6	100	10.15	1.19	6.27	0.292	39.8	3.81	9.51	47.3	Clear	No
08:50	5	100	10.15	1.32	6.27	0.296	35.6	3.7	9.59	45	Clear	No
08:53	3	100	10.15	0.00	6.27	0.294	22.6	3.74	9.54	45.5	Clear	No
08:57	4	100	10.15	0.00	6.26	0.293	21.2	3.72	9.55	46.1	Clear	No
09:01	4	100	10.15	0.00	6.28	0.292	20.9	3.81	9.58	46.8	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Amber bottle had H2SO4 on outside

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Casing Volume Conversion

Well diameter (inches)	1 = 0.04	1.5 = 0.09	2.5 = 0.26	3.5 = 0.50	6 = 1.47
= gallons per foot	1.25 = 0.06	2 = 0.16	3 = 0.37	4 = 0.65	

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHL-4			**Date**	5/20/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 68
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.55	**Total Depth (ft-bmp)**	14.5	**Water Column(ft)**	4	**Gallons in Well**	0.64
MP Elevation		**Pump Intake (ft-bmp)**	12	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:40	**Volumes Purged**		**Sample ID**	SHL-4-SPR20	**Sampled by**	Diane Champagne
Purge Start	08:41	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	09:51						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:42		240	10.56	0.00	7.4	0.251	667	0.88	10.37	34.2	Orange	No
08:45	3	240	10.57	0.00	7.17	0.252	681	0.78	10.51	26.5	Orange	No
08:50	5	240	10.58	0.00	7.05	0.253	214	0.66	10.66	23.9	Orange	No
08:55	5	240	10.58	0.00	6.92	0.256	105	0.58	10.49	22.2	Orange	No
09:01	6	240	10.58	0.00	6.86	0.259	81.3	0.54	10.95	19.7	Orange	No
09:06	5	240	10.58	0.00	6.8	0.259	84.3	0.51	10.54	21.3	Orange	No
09:10	4	240	10.58	0.00	6.7	0.259	39.5	0.5	10.61	23.6	Orange	No
09:15	5	240	10.58	0.00	6.69	0.26	26.8	0.49	10.92	21	Orange	No
09:20	5	240	10.58	0.00	6.67	0.261	25.9	0.46	10.61	23.4	Orange	No
09:25	5	240	10.58	0.00	6.63	0.263	22.2	0.46	10.96	20.5	Orange	No
09:30	5	240	10.58	0.00	6.65	0.262	20.9	0.45	11.03	18.5	Orange	No
09:35	5	240	10.58	0.00	6.58	0.262	21	0.46	11.02	18.6	Orange	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Location:	Barrier wall	Well Locked at Arrival:	yes
Condition of Well:		Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-11-06			**Date**	5/20/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 68
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	19.02	**Total Depth (ft-bmp)**	35.6	**Water Column(ft)**	17	**Gallons in Well**	2.69
MP Elevation		**Pump Intake (ft-bmp)**	33	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:30	**Volumes Purged**		**Sample ID**	SHM-11-6-sPR20	**Sampled by**	Diane Champagne
Purge Start	#Error	**Gallons Purged**		**Replicate/ Code No.**	Shm-dup 03-spr20		
Purge End	11:43						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:11		200	10.58	0.00	6.3	0.683	116	1.04	11.33	60.5	No	No
10:21	10	200	19.12	0.00	5.74	0.649	106	0.85	11.09	50	No	No
10:25	4	200	19.12	0.00	5.62	0.652	36.8	0.73	11.06	47.9	No	No
10:31	6	200	19.12	0.00	5.45	0.654	34.1	0.62	11.12	48.3	No	No
10:35	4	200	19.14	0.00	5.41	0.655	21.4	0.54	11.24	46.9	No	No
10:42	7	200	19.14	0.00	5.2	0.654	9.94	0.5	11.37	49.8	No	No
10:46	4	200	19.14	0.00	5.15	0.656	8.81	0.48	11.22	52.9	No	No
10:51	5	200	19.14	0.00	5.15	0.656	7.74	0.46	11.12	51.6	No	No
10:55	4	200	19.14	0.00	5.16	0.658	8.46	0.44	11.2	50.6	No	No
11:02	7	200	19.14	0.00	5.28	0.656	8.17	0.42	11.29	44.4	No	No
11:05	3	200	19.18	0.00	5.27	0.655	8.11	0.41	11.18	43.6	No	No
11:10	5	200	19.18	0.00	5.25	0.657	2.99	0.41	11.22	40.6	No	No
11:15	5	200	19.18	0.00	5.1	0.656	2.88	0.41	11.35	42.5	No	No
11:20	5	200	19.18	0.00	5.04	0.656	3.03	0.41	11.21	44.5	No	No
11:25	5	200	19.18	0.00	5.08	0.658	3.6	0.42	11.32	44.7	No	No

Constituent Sampled	Container	Number	Preservative
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Comments:

Well Casing Volume Conversion

Well diameter (inches)	1 = 0.04	1.5 = 0.09	2.5 = 0.26	3.5 = 0.50	6 = 1.47
= gallons per foot	1.25 = 0.06	2 = 0.16	3 = 0.37	4 = 0.65	

Well Information

Well Location:	Barrier wall	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-13-04			**Date**	5/20/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	18.64	**Total Depth (ft-bmp)**	29.81	**Water Column(ft)**	11	**Gallons in Well**	1.82
MP Elevation		**Pump Intake (ft-bmp)**	24	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:35	**Volumes Purged**		**Sample ID**	SHM-13-04-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	14:03	**Gallons Purged**					
Purge End	15:01			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:10		100	18.65	0.13	6.85	0.772	49.1	7.74	17.91	104.9	Light brown	No
14:15	5	100	18.65	0.26	6.28	0.739	46.1	7.91	15.07	160	Light brown	No
14:20	5	100	18.65	0.40	6.13	0.744	39	7.05	14.56	176.6	Light brown	No
14:25	5	100	18.65	0.53	5.91	0.745	32.3	7.14	14.48	128.8	Light brown	No
14:29	4	100	18.65	0.00	5.82	0.742	28.2	7.15	14.27	111.1	Light brown	No
14:35	6	100	18.65	0.00	5.82	0.715	29.2	6.63	14.11	83.3	Light brown	No
14:40	5	100	18.65	0.00	5.92	0.704	22.3	6.54	14.07	68.4	Light brown	No
14:45	5	100	18.65	0.00	6.03	0.69	19.8	6.48	13.52	69.9	Light brown	No
14:50	5	100	18.65	0.00	6.08	0.692	19.7	6.4	13.66	58.6	Light brown	No
14:54	4	100	18.65	0.00	6.16	0.674	17.9	6.34	13.57	50.8	Light brown	No
14:59	5	100	18.65	0.00	6.23	0.668	15.6	6.34	13.33	49	Light brown	No
15:05	6	100	18.65	0.00	6.3	0.658	15.5	6.08	13.3	43.8	Light brown	No
15:10	5	100	18.65	0.00	6.4	0.65	14.4	6.16	13.24	39.4	Light brown	No
15:15	5	100	18.65	0.00	6.38	0.665	13.9	5.98	13.25	44	Light brown	No
15:19	4	100	18.65	0.00	6.39	0.641	11.4	5.86	13.32	45.9	Light brown	No
15:24	5	100	18.65	0.00	6.41	0.64	10.8	5.88	13.21	47.6	Light brown	No
15:29	5	100	18.65	0.00	6.42	0.64	10.4	6.05	13.38	49.1	Light brown	No

Constituent Sampled	Container	Number	Preservative
Dissolved Metals			

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well:

Well Completion: NA

Well Locked at Arrival:

Well Locked at Departure:

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-01-36X			**Date**	5/20/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	7.56	**Total Depth (ft-bmp)**	11	**Water Column(ft)**	3	**Gallons in Well**	0.14
MP Elevation		**Pump Intake (ft-bmp)**	8	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:00	**Volumes Purged**		**Sample ID**	SHP-01-36X-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	12:00	**Gallons Purged**					
Purge End	13:11			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:01		100	7.82	0.00	7.26	0.155	51.2	5.48	12.7	-21.1	Clear	No
12:06	5	100	7.82	0.26	6.78	0.246	17.1	3.35	12.29	5.6	Clear	No
12:11	5	100	7.82	0.40	6.51	0.264	4.39	3.09	12.27	17.3	Clear	No
12:15	4	100	7.82	0.53	6.44	0.271	0.43	3.03	11.9	21.4	Clear	No
12:20	5	100	7.82	0.00	6.43	0.27	0.24	3.2	11.86	22.5	Clear	No
12:25	5	100	7.82	0.00	6.41	0.272	0.02	3.18	11.82	23.4	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Completion: Stick-up

Well Locked at Arrival: no

Well Locked at Departure: no

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-01-37X			**Date**	5/20/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	6.36	**Total Depth (ft-bmp)**	11.21	**Water Column(ft)**	5	**Gallons in Well**	0.2
MP Elevation		**Pump Intake (ft-bmp)**	9	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:10	**Volumes Purged**		**Sample ID**	SHP-01-37X-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	10:34	**Gallons Purged**					
Purge End	11:20			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:35		100	6.44	0.13	7.17	0.385	52.9	5.29	13.4	-44.3	Clear	No
10:40	5	100	6.44	0.26	6.65	0.338	20	3.67	12.23	-29.2	Clear	No
10:45	5	100	6.45	0.40	6.64	0.321	5.38	3.58	11.94	-21.5	Clear	No
10:50	5	100	6.45	0.53	6.58	0.319	2.88	3.48	11.94	-19	Clear	No
10:55	5	100	6.45	0.53	6.61	0.319	1.24	3.79	12.04	-17.7	Clear	No
10:59	4	100	6.45	0.66	6.59	0.316	0.74	3.59	12.1	-17.3	Clear	No
11:02	3	100	6.45	0.00	6.58	0.315	0.73	3.77	12.19	-17	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: SHP

Condition of Well: Good

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-2016-07A			**Date**	5/20/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 71
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	15.2	**Total Depth (ft-bmp)**	33.6	**Water Column(ft)**	18	**Gallons in Well**	1.68
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:45	**Volumes Purged**		**Sample ID**	SHP-2016-7A-SPR20	**Sampled by**	Diane Champagne
Purge Start	12:23	**Gallons Purged**					
Purge End	13:58			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:27		200	15.2	0.00	6.72	0.103	33.4	1.02	13.23	-7.1	No	Yes
12:31	4	200	15.5	0.00	6.59	0.1	24.3	0.75	12.99	-10.6	No	Yes
12:35	4	200	15.74	0.00	6.53	0.097	7.83	0.57	12.98	-11.8	No	Yes
12:40	5	200	15.81	0.00	6.57	0.092	7.01	0.49	12.93	-16.2	No	Yes
12:48	8	200	15.89	0.00	6.34	0.088	5.67	0.43	13.36	-7.7	No	Yes
12:51	3	200	15.85	0.00	6.42	0.083	4.47	0.42	13.15	-11.6	No	Yes
12:57	6	200	15.81	0.00	6.29	0.078	4.57	0.4	13.5	-6.3	No	Yes
13:00	3	200	15.81	0.00	6.32	0.077	3.03	0.4	13.49	-2.9	No	Yes
13:05	5	200	15.81	0.00	6.27	0.075	2.55	0.4	13.68	0.5	No	Yes
13:10	5	200	15.81	0.00	6.3	0.075	2.01	0.4	13.69	0.2	No	Yes
13:15	5	200	15.81	0.00	6.12	0.073	4.79	0.39	13.23	8.2	No	Yes
13:20	5	200	15.81	0.00	6.2	0.072	5.11	0.39	13.49	6.2	No	Yes
13:25	5	200	15.81	0.00	6.15	0.07	2.72	0.4	12.87	8.9	No	Yes
13:30	5	200	15.81	0.00	6.13	0.069	2.46	0.43	13.27	12.6	No	Yes
13:35	5	200	15.81	0.00	6.04	0.069	2.68	0.39	13.58	14.7	No	Yes
13:41	6	200	15.81	0.00	6.12	0.068	2.22	0.39	13.67	10.1	No	Yes

Constituent Sampled	Container	Number	Preservative
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Dissolved Organic Carbon

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Landfill	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-2016-2A			**Date**	5/20/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	12C, Sunny, No wind
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	14.37	**Total Depth (ft-bmp)**	27.2	**Water Column(ft)**	13	**Gallons in Well**	0.52
MP Elevation		**Pump Intake (ft-bmp)**	22.2	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:40	**Volumes Purged**		**Sample ID**	SHP-2016-2A-SPR20	**Sampled by**	Desmond Bedard
Purge Start	09:50	**Gallons Purged**					
Purge End	10:40			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:50		100	14.37	0.00	6.6	0.171	9.09	7.11	13.67	119.6	None; clear	None
09:55	5	100	14.44	0.00	6.39	0.093	17.2	2.7	10.32	4.1	None; clear	None
10:00	5	100	14.45	0.00	7.22	0.097	5.62	2.29	11.19	-25.3	None; clear	None
10:05	5	100	14.45	0.00	7.92	0.098	2.73	2.31	11.52	-38.2	None; clear	None
10:10	5	100	14.45	0.00	8.3	0.098	2.13	2.2	11.54	-31.3	None; clear	None
10:15	5	100	14.45	0.00	8.52	0.097	2.94	2.28	11.26	-59.1	None; clear	None
10:20	5	100	14.45	0.00	8.36	0.096	3.42	2.24	11.19	-43.6	None; clear	None
10:25	5	100	14.45	0.00	8.41	0.096	2.66	2.24	11.19	-44.2	None; clear	None
10:30	5	100	14.45	0.00	8.48	0.096	2.59	2.23	11.25	-45.6	None; clear	None
10:35	5	100	14.45	0.00	8.47	0.096	2.6	2.28	11.24	-46.9	None; clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Used tubing found in well

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: North west of EW treatment building

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-2016-2B			**Date**	5/20/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	8C, Sunny, No wind
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.46	**Total Depth (ft-bmp)**	87.7	**Water Column(ft)**	74	**Gallons in Well**	3.02
MP Elevation		**Pump Intake (ft-bmp)**	42.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:20	**Volumes Purged**		**Sample ID**	SHP-2016-2B-SPR20	**Sampled by**	Desmond Bedard
Purge Start	08:15	**Gallons Purged**					
Purge End	09:20			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:15		150	13.46	0.00	6.52	0.211	7.1	2.12	8.18	13.6	None; clear	None
08:20	5	150	13.5	0.00	4.94	0.212	11.3	1.19	8.21	95.9	None; clear	None
08:25	5	110	13.5	0.00	4.97	0.216	2.12	0.91	8.33	94.2	None; clear	None
08:30	5	110	13.48	0.00	5.28	0.23	1.37	0.9	8.35	85.3	None; clear	None
08:35	5	110	13.48	0.00	5.63	0.242	2.2	0.73	8.41	68	None; clear	None
08:40	5	110	13.48	0.00	5.8	0.244	1.18	0.62	8.54	58.7	None; clear	None
08:45	5	110	13.48	0.00	6.02	0.244	1.21	0.59	8.54	47.2	None; clear	None
08:50	5	110	13.48	0.00	6.14	0.246	1.3	0.56	8.65	38.4	None; clear	None
08:55	5	110	13.48	0.00	6.38	0.246	1.09	0.59	8.58	32.1	None; clear	None
09:00	5	110	13.48	0.00	6.35	0.247	1.14	0.55	8.61	26.1	None; clear	None
09:05	5	110	13.48	0.00	6.34	0.247	1.18	0.46	8.59	25.4	None; clear	None
09:10	5	110	13.48	0.00	6.34	0.248	1.15	0.44	8.62	24.6	None; clear	None
09:15	5	110	13.48	0.00	6.38	0.248	1.15	0.46	8.62	19.5	None; clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Used fresh tubing; none found in well

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Woods north west of EW treatment building	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-2016-3A			**Date**	5/20/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	20C, Sunny, Light breeze
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.56	**Total Depth (ft-bmp)**	27.3	**Water Column(ft)**	17	**Gallons in Well**	0.68
MP Elevation		**Pump Intake (ft-bmp)**	22.3	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:25	**Volumes Purged**		**Sample ID**	SHP-2016-3A-SPR20	**Sampled by**	Desmond Bedard
Purge Start	14:20	**Gallons Purged**					
Purge End	15:25			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:20		170	10.56	0.00	7.02	0.111	7.31	5.7	10.91	86.5	Clear and colorless	None
14:25	5	150	11.45	0.00	4.33	0.092	9.18	0.54	10.34	193.4	Clear and colorless	None
14:30	5	120	11.4	0.00	6.08	0.096	12.39	0.59	9.99	89.4	Clear and colorless	None
14:35	5	120	11.37	0.00	5.34	0.093	0.95	0.54	9.76	128.7	Clear and colorless	None
14:40	5	120	11.37	0.00	5.78	0.092	3.03	0.6	9.77	102.9	Clear and colorless	None
14:45	5	120	11.37	0.00	5.9	0.09	1.09	0.62	9.71	99.6	Clear and colorless	None
14:50	5	120	11.37	0.00	5.93	0.09	0.84	0.64	9.81	98.2	Clear and colorless	None
14:55	5	120	11.37	0.00	6.48	0.089	1.98	0.71	10.06	70.6	Clear and colorless	None
15:00	5	120	11.39	0.00	6.33	0.088	1.91	0.8	10.09	83.2	Clear and colorless	None
15:05	5	120	11.39	0.00	6.29	0.087	1.03	0.93	10.05	86.6	Clear and colorless	None
15:10	5	120	11.39	0.00	6.16	0.086	0.98	1.03	10.01	96.8	Clear and colorless	None
15:15	5	120	11.39	0.00	6.15	0.086	0.95	1.11	10.09	97.3	Clear and colorless	None
15:20	5	120	11.39	0.00	6.16	0.085	1.09	1.13	10.13	94.4	Clear and colorless	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Used tubing found in well

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	North west of EW treatment building	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-2016-3B			**Date**	5/20/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	18C, Sunny, No wind
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.66	**Total Depth (ft-bmp)**	87.4	**Water Column(ft)**	77	**Gallons in Well**	3.12
MP Elevation		**Pump Intake (ft-bmp)**	37.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:50	**Volumes Purged**		**Sample ID**	SHP-2016-3B-SPR20	**Sampled by**	Desmond Bedard
Purge Start	12:35	**Gallons Purged**					
Purge End	13:50			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:35		160	10.66	0.00	7.55	0.195	2.61	3.69	8.45	23.4	None; clear	None
12:40	5	120	10.71	0.00	3.69	0.187	7.36	0.84	8.63	211.2	None; clear	None
12:45	5	120	10.69	0.00	4.07	0.186	3.09	0.66	8.77	190.2	None; clear	None
12:50	5	120	10.68	0.00	4.78	0.186	2.88	0.66	8.65	149.9	None; clear	None
12:55	5	120	10.68	0.00	5.5	0.189	1.72	0.58	9.42	103.1	None; clear	None
13:00	5	120	10.68	0.00	5.97	0.189	2.57	0.47	9.89	84	None; clear	None
13:05	5	120	10.68	0.00	6.43	0.191	2.44	0.42	9.99	55.4	None; clear	None
13:10	5	120	10.68	0.00	6.42	0.193	2.48	0.38	10.12	56.8	None; clear	None
13:15	5	120	10.68	0.00	6.33	0.189	2.26	0.36	9.95	62.4	None; clear	None
13:20	5	120	10.68	0.00	6.21	0.192	2.27	0.35	9.88	69.5	None; clear	None
13:25	5	120	10.68	0.00	6.41	0.195	2.2	0.32	10.11	55.8	None; clear	None
13:30	5	120	10.68	0.00	6.11	0.195	2.18	0.31	9.92	73.4	None; clear	None
13:35	5	120	10.68	0.00	6.29	0.201	2.19	0.31	9.89	62.1	None; clear	None
13:40	5	120	10.68	0.00	6.34	0.201	2.18	0.29	9.91	59.3	None; clear	None
13:45	5	120	10.68	0.00	6.36	0.202	2.22	0.29	10.02	55	None; clear	None

Constituent Sampled	Container	Number	Preservative
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Comments: Used new tubing; none found in well

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot	1 = 0.04	1.5 = 0.09	2.5 = 0.26	3.5 = 0.50	6 = 1.47
	1.25 = 0.06	2 = 0.16	3 = 0.37	4 = 0.65	

Well Information

Well Location:	North west of EW treatment building	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EPA-PZ-2012-3A			**Date**	5/21/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.93	**Total Depth (ft-bmp)**	26.68	**Water Column(ft)**	17	**Gallons in Well**	0.68
MP Elevation		**Pump Intake (ft-bmp)**	21	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	08:40	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-3A-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	07:58	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
07:59		100	9.96	0.13	7.71	0.144	64.6	7.7	10.46	-26.4	Light brown	No
08:04	5	100	9.98	0.26	6.25	0.367	56.2	3.86	9.89	1.5	Light brown	No
08:07	3	100	9.96	0.00	6.2	0.258	35.9	3.63	9.98	0.9	Light brown	No
08:10	3	100	9.99	0.00	6.19	0.256	27.5	3.57	9.99	-0.7	Light brown	No
08:15	5	100	9.99	0.66	6.18	0.256	16.6	3.7	10.07	-2	Light brown	No
08:20	5	100	9.99	0.00	6.17	0.257	4.74	3.67	10.17	-3.2	Light brown	No
08:25	5	100	9.99	0.00	6.17	0.258	0.34	3.63	10.27	-5.4	Light brown	No
08:30	5	100	9.99	0.00	6.16	0.26	0.02	3.56	10.25	-8	Light brown	No
08:35	5	100	9.99	0.00	6.14	0.258	0.02	3.5	10.31	-11	Light brown	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Missing plug

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EPA-PZ-2012-3B			**Date**	5/21/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	60, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.9	**Total Depth (ft-bmp)**	76.75	**Water Column(ft)**	67	**Gallons in Well**	2.72
MP Elevation		**Pump Intake (ft-bmp)**	71	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:45	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-3B-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	09:07	**Gallons Purged**					
Purge End	10:18			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:08		100	9.98	0.13	6.54	0.556	40	5.92	11.74	-84.4	Clear	No
09:12	4	100	9.98	0.26	6.55	0.528	0.74	4.54	11.46	-90.4	Clear	No
09:15	3	100	9.98	0.00	6.56	0.528	0.02	3.85	11.39	-92.3	Clear	No
09:20	5	100	9.98	0.00	6.6	0.529	0.02	3.84	11.5	-94.1	Clear	No
09:25	5	100	9.98	0.00	6.62	0.528	0.02	3.81	11.33	-95.4	Clear	No
09:30	5	100	9.98	0.00	6.63	0.529	0.02	3.78	11.35	-96.5	Clear	No
09:35	5	100	9.98	0.00	6.63	0.528	0.02	3.74	11.54	-97.1	Clear	No
09:40	5	100	9.98	0.00	6.64	0.533	0.02	3.72	11.62	-97.8	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: SHL

Condition of Well: Good

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-05-41B			**Date**	5/21/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 75
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.14	**Total Depth (ft-bmp)**	64	**Water Column(ft)**	54	**Gallons in Well**	8.75
MP Elevation		**Pump Intake (ft-bmp)**	61	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:30	**Volumes Purged**		**Sample ID**	SHM5-41B-SPR20	**Sampled by**	Diane Champagne
Purge Start	#Error	**Gallons Purged**					
Purge End	15:36			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:50		180	10.15	0.00	5.79	4.895	26.4	0.65	11.99	185.8	Pale orange	No
14:54	4	180	10.15	0.00	5.63	4.012	22.1	0.55	12.04	201	Pale orange	No
15:00	6	180	10.15	0.00	5.59	3.874	27.3	0.49	12.18	214.9	Pale orange	No
15:05	5	180	10.15	0.00	5.37	2.46	19.9	0.39	12.46	213.1	Pale orange	No
15:12	7	180	10.15	0.00	5.34	1.869	20.4	0.39	12.06	233.5	Pale orange	No
15:16	4	180	10.15	0.00	5.34	1.527	23.1	0.37	12.35	236.7	Pale orange	No
15:20	4	180	10.15	0.00	5.32	1.555	23.5	0.36	12.24	233.3	Pale orange	No
15:25	5	180	10.15	0.00	5.33	1.561	22	0.36	12.37	235.8	Pale orange	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Nearfields	Well Locked at Arrival:	no
Condition of Well:	Fair. Missing bolts	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-05-41C			**Date**	5/21/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 75
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.69	**Total Depth (ft-bmp)**	93	**Water Column(ft)**	82	**Gallons in Well**	13.37
MP Elevation		**Pump Intake (ft-bmp)**	90	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:20	**Volumes Purged**		**Sample ID**	sHM-05-41C-SPR20	**Sampled by**	Diane Champagne
Purge Start	13:28	**Gallons Purged**					
Purge End	14:38			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:30		180	10.73	0.00	5.23	10.83	9.54	0.7	12.92	323.9		
13:35	5	180	10.79	0.00	5.25	10.78	8.14	0.62	12.64	325.4		
13:40	5	180	10.79	0.00	5.6	9.999	9.35	0.51	12.75	292.1		
13:45	5	180	10.79	0.00	6.08	7.494	8.88	0.43	12.24	205.8		
13:50	5	180	10.79	0.00	6.1	7.344	5.11	0.43	12.2	199.5		
13:55	5	180	10.79	0.00	6.62	6.444	8.5	0.53	12.13	135		
14:00	5	180	10.79	0.00	6.23	5.775	8.37	0.4	11.85	124.6		
14:05	5	180	10.79	0.00	6.26	5.216	8.36	0.39	12.28	106.5		
14:10	5	180	10.79	0.00	6.2	4.666	8.38	0.38	12.33	92.1		
14:15	5	180	10.79	0.00	6.16	4.571	8.13	0.38	12.3	83.7		
14:20	5	180	10.73	0.00	6.2	4.549	7.96	0.37	12.36	89.7		

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Missing bolts, but inside of we'll box has stripped threads. Bolts will not secure lid

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Nearfields

Well Locked at Arrival: no

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Fair	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-13-03			**Date**	5/21/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	73, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.18	**Total Depth (ft-bmp)**	52.3	**Water Column(ft)**	47	**Gallons in Well**	7.66
MP Elevation		**Pump Intake (ft-bmp)**	47	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:10	**Volumes Purged**		**Sample ID**	SHM-13-03-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	11:06	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:05		100	9.98	0.00	7.13	0.705	22.8	7.02	15.22	-25.4	Clear	No
11:10	5	100	5.19	0.00	6.51	0.4	38.6	3.87	13.5	38.8	Clear	No
11:15	5	100	5.19	0.00	6.28	0.414	18.8	3.46	13.64	0.1	Clear	No
11:20	5	100	5.19	0.00	6.15	0.421	5.38	3.43	14	-5.8	Clear	No
11:25	5	100	5.19	0.00	6.09	0.428	2.08	3.29	14.19	-6.4	Clear	No
11:30	5	100	5.19	0.00	6.03	0.432	0.02	3.3	14.22	-7.1	Clear	No
11:35	5	100	5.19	0.00	5.96	0.442	0.02	3.2	14.24	-8.9	Clear	No
11:40	5	100	5.19	0.00	5.9	0.457	0.02	3.25	14.28	-12	Clear	No
11:45	5	100	5.19	0.00	5.79	0.547	0.02	3.18	15.03	-18.1	Clear	No
11:50	5	100	5.19	0.00	5.65	0.972	0.02	3.27	14.93	-34.4	Clear	No
11:55	5	100	5.19	0.00	5.82	1.061	0.02	3.29	15.37	-40.4	Clear	No
12:00	5	100	5.19	0.00	5.86	1.065	0.02	3.25	15.48	-40.6	Clear	No
12:05	5	100	5.19	0.00	5.77	1.057	0.02	3.21	15.38	-38.3	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	no
Condition of Well:	Some kind of obstruction/kink at 5'	Well Locked at Departure:	no
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-93-22B			**Date**	5/21/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	22C, Sunny, No wind
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.89	**Total Depth (ft-bmp)**	94.15	**Water Column(ft)**	87	**Gallons in Well**	56.72
MP Elevation		**Pump Intake (ft-bmp)**	34.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:30	**Volumes Purged**		**Sample ID**	SHM-93-22B-SPR20	**Sampled by**	Desmond Bedard
Purge Start	12:25	**Gallons Purged**					
Purge End	13:30			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:25		160	6.89	0.00	6.34	0.49	64.6	1.1	10.18	90.6	Clear and colorless	None
12:30	5	120	6.9	0.00	4.69	0.494	45.2	0.82	10.39	156.5	Clear and colorless	None
12:35	5	120	6.89	0.00	5.05	0.498	45.3	1.41	10.7	137.6	Clear and colorless	None
12:40	5	120	6.89	0.00	5.59	0.498	61.4	0.65	10.45	108.2	Clear and colorless	None
12:45	5	120	6.89	0.00	5.85	0.497	53.3	0.48	10.89	102.2	Clear and colorless	None
12:50	5	120	6.89	0.00	5.96	0.495	48.7	0.48	10.58	93.9	Clear and colorless	None
12:55	5	120	6.89	0.00	6.15	0.499	26.6	0.4	10.99	83.1	Clear and colorless	None
13:00	5	120	6.89	0.00	6.21	0.499	31.1	0.4	10.98	80.6	Clear and colorless	None
13:05	5	120	6.89	0.00	6.26	0.491	19.4	0.38	11.01	78.5	Clear and colorless	None
13:10	5	120	6.89	0.00	5.98	0.49	19	0.35	10.92	94.9	Clear and colorless	None
13:15	5	120	6.89	0.00	6.11	0.491	17.1	0.33	11.03	86.2	Clear and colorless	None
13:20	5	120	6.89	0.00	6.17	0.488	16.7	0.34	10.97	83.9	Clear and colorless	None
13:25	5	120	6.89	0.00	6.13	0.481	17.3	0.32	10.96	87.1	Clear and colorless	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Used tubing found in well

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	North of EW treatment building	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-01-38A			**Date**	5/21/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	70, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	4.04	**Total Depth (ft-bmp)**	8.84	**Water Column(ft)**	5	**Gallons in Well**	0.19
MP Elevation		**Pump Intake (ft-bmp)**	4	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:30	**Volumes Purged**		**Sample ID**	SHP-01-38A	**Sampled by**	Gabriel O'Connor
Purge Start	13:20	**Gallons Purged**		**Replicate/ Code No.**	SHL-DUP04-SPR20		
Purge End	14:47						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:25		100	4.1	0.13	7.9	0.112	45.4	6.74	12.95	-44.9	Clear	No
13:30	5	100	4.1	0.00	6.2	0.14	11.6	4.17	10.54	-6.2	Clear	No
13:35	5	100	4.1	0.00	6.23	0.142	4.01	3.6	11.72	-3.1	Clear	No
13:40	5	100	4.1	0.00	6.17	0.142	0.94	3.68	10.77	-1.5	Clear	No
13:45	5	100	4.1	0.00	6.11	0.143	0.02	3.38	10.85	0.9	Clear	No
13:50	5	100	4.1	0.00	6.12	0.143	0.02	3.32	10.77	1.2	Clear	No
13:55	5	100	4.1	0.00	6.13	0.143	0.02	3.33	10.78	1.3	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: SHL

Condition of Well: Good

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-2016-06A			**Date**	5/21/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 53
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	28.6	**Total Depth (ft-bmp)**	86	**Water Column(ft)**	57	**Gallons in Well**	5.25
MP Elevation		**Pump Intake (ft-bmp)**	83	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:10	**Volumes Purged**		**Sample ID**	SHP-2016-6A-SPR20	**Sampled by**	Diane Champagne
Purge Start	08:45	**Gallons Purged**					
Purge End	09:32			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:45		120	28.7	0.00	7.68	0.351	5.61	0.99	11.32	31.1	No	No
08:50	5	120	28.7	0.00	7.68	0.338	5.43	0.84	11.53	29.1	No	No
08:55	5	120	28.7	0.00	7.61	0.332	5.07	0.87	11.63	25.6	No	No
09:00	5	120	28.7	0.00	7.64	0.33	5.11	0.84	11.62	24.4	No	No
09:05	5	120	29.6	0.00	7.63	0.33	5.23	0.88	11.65	23.1	No	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Nearfields
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-2016-06B			**Date**	5/21/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 53
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21	**Total Depth (ft-bmp)**	112	**Water Column(ft)**	91	**Gallons in Well**	8.32
MP Elevation		**Pump Intake (ft-bmp)**	107	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:55	**Volumes Purged**		**Sample ID**	SHP-2016-6B-Spr20	**Sampled by**	Diane Champagne
Purge Start	09:32	**Gallons Purged**					
Purge End	11:12			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:35		115	21.6	0.00	7.42	0.417	54.2	1.1	12.67	90.6	Silty grey	Yes
09:41	6	115	21.99	0.00	7.26	0.34	50.1	0.78	13.06	83.7	Silty grey	Yes
09:47	6	115	22.2	0.00	7.26	0.335	14.1	0.7	12.77	77.9	Silty grey	Yes
09:50	3	115	22.33	0.00	7.24	0.334	13.1	0.58	13.01	74.6	Silty grey	Yes
09:55	5	115	22.4	0.00	7.32	0.338	14.9	0.52	13.18	69.1	Silty grey	Yes
10:00	5	115	22.6	0.00	7.22	0.36	15.9	0.47	13.38	70.3	Silty grey	Yes
10:05	5	115	22.7	0.00	7.27	0.573	15.3	0.4	13.01	67.5	Silty grey	Yes
10:10	5	115	22.77	0.00	7.12	1.001	14.1	0.4	13.21	58.9	Silty grey	Yes
10:17	7	115	22.79	0.00	7.29	1.12	13.3	0.44	13.72	22.3	Silty grey	Yes
10:22	5	115	22.79	0.00	727	1.105	13.7	0.42	13.72	14.2	Silty grey	Yes
10:25	3	115	22.79	0.00	7.28	1.09	13.8	0.41	13.53	2.5	Silty grey	Yes
10:33	8	115	22.83	0.00	7.32	1.056	13.8	0.38	14.07	-4.1	Silty grey	Yes
10:39	6	115	22.79	0.00	7.25	1.016	4.28	0.38	13.74	-6.5	Silty grey	Yes
10:43	4	115	22.79	0.00	7.27	0.98	4.44	0.38	13.99	-10.5	Silty grey	Yes
10:45	2	115	22.79	0.00	7.28	0.978	3.92	0.39	13.96	-12.4	Silty grey	Yes
10:50	5	115	22.79	0.00	7.23	0.971	3.83	0.38	13.89	-13.9	Silty grey	Yes

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Dissolved Organic Carbon

Comments:

Well Casing Volume Conversion

Well diameter (inches)	1 = 0.04	1.5 = 0.09	2.5 = 0.26	3.5 = 0.50	6 = 1.47
= gallons per foot	1.25 = 0.06	2 = 0.16	3 = 0.37	4 = 0.65	

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Nearfields	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-2016-06C			**Date**	5/21/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 66
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1.5	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	20.29	**Total Depth (ft-bmp)**	133	**Water Column(ft)**	113	**Gallons in Well**	10.3
MP Elevation		**Pump Intake (ft-bmp)**	130	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:55	**Volumes Purged**		**Sample ID**	SHO-2016-06C-SPR20	**Sampled by**	Diane Champagne
Purge Start	11:17	**Gallons Purged**					
Purge End	13:14			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:19		180	20.51	0.00	7.17	0.245	26.1	0.98	15.41	81.6	No	Yes
11:25	6	180	20.51	0.00	6.9	0.243	22.2	0.67	15.65	70.8	No	Yes
11:32	7	180	20.51	0.00	6.95	0.242	18.5	0.57	15.87	66.7	No	Yes
11:35	3	180	20.61	0.00	6.95	0.243	4.84	0.57	15.76	67.2	No	Yes
11:41	6	180	20.61	0.00	6.9	0.244	4.11	0.53	15.36	75	No	Yes
11:56	15	180	20.61	0.00	6.95	0.244	3.38	0.45	15.32	93	No	Yes
12:00	4	180	20.61	0.00	6.89	0.245	2.87	0.44	17.14	105.9	No	Yes
12:05	5	180	20.61	0.00	6.78	0.244	2.84	0.43	16.91	125.3	No	Yes
12:10	5	180	20.61	0.00	6.76	0.244	2.7	0.42	17.22	133.3	No	Yes
12:15	5	180	20.61	0.00	6.7	0.244	2.11	0.42	17.85	146.3	No	Yes
12:20	5	180	20.61	0.00	6.53	0.245	3.04	0.42	17.41	168.3	No	Yes
12:25	5	180	20.61	0.00	6.11	0.244	3.02	0.41	17.6	207.5	No	Yes
12:31	6	180	20.61	0.00	5.96	0.245	2.97	0.41	17.45	238.8	No	Yes
12:35	4	180	20.61	0.00	5.9	0.244	2.83	0.4	17.4	271.1	No	Yes
12:40	5	180	20.61	0.00	5.96	0.245	2.65	0.4	17.39	276.4	No	Yes
12:46	6	180	20.61	0.00	6.03	0.245	2.47	0.41	17.49	268.3	No	Yes
12:51	5	180	20.61	0.00	6.03	0.244	2.74	0.43	17.3	271.9	No	Yes

Constituent Sampled	Container	Number	Preservative
Dissolved Metals			

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Nearfields	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-2016-4A			**Date**	5/21/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	17C, Sunny, No wind
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	17.44	**Total Depth (ft-bmp)**	32.6	**Water Column(ft)**	15	**Gallons in Well**	0.62
MP Elevation		**Pump Intake (ft-bmp)**	27.6	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:25	**Volumes Purged**		**Sample ID**	SHP-2016-4A-SPR20	**Sampled by**	Desmond Bedard
Purge Start	10:30	**Gallons Purged**					
Purge End	11:25			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:30		140	17.44	0.00	8.89	0.049	112.8	9.16	10.93	108.9	Clear and colorless	None
10:35	5	120	17.78	0.00	6.24	0.045	15.4	8.41	10.26	160.7	Clear and colorless	None
10:40	5	120	17.76	0.00	4.92	0.046	21.9	8.3	10.71	212.1	Clear and colorless	None
10:45	5	120	17.75	0.00	4.2	0.043	13.4	8.18	10.03	250.5	Clear and colorless	None
10:50	5	120	17.75	0.00	4.67	0.046	7.52	7.89	10.55	223.9	Clear and colorless	None
10:55	5	120	17.75	0.00	4.95	0.045	2.85	7.41	10.65	209.9	Clear and colorless	None
11:00	5	120	17.75	0.00	5.51	0.045	1.99	7.13	10.85	173.7	Clear and colorless	None
11:05	5	120	17.75	0.00	5.67	0.046	2.45	6.8	11.22	165.1	Clear and colorless	None
11:10	5	120	17.75	0.00	5.78	0.046	2.04	6.7	11.21	157.2	Clear and colorless	None
11:15	5	120	17.75	0.00	5.84	0.047	2.09	6.67	11.03	152.3	Clear and colorless	None
11:20	5	120	17.75	0.00	5.82	0.046	1.6	6.48	11.16	153.1	Clear and colorless	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Used tubing found in well

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Northwest of EW treatment building

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-2016-4B			**Date**	5/21/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	15C, Sunny, No wind
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	17.34	**Total Depth (ft-bmp)**	92.35	**Water Column(ft)**	75	**Gallons in Well**	3.05
MP Elevation		**Pump Intake (ft-bmp)**	45.3	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:10	**Volumes Purged**		**Sample ID**	SHP-2016-4B-SPR20	**Sampled by**	Desmond Bedard
Purge Start	09:15	**Gallons Purged**					
Purge End	10:10			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:15		160	17.34	0.00	6.59	0.195	5.54	6.5	8.94	7.8	Clear and colorless	None
09:20	5	120	17.39	0.00	5.25	0.188	6.12	3.62	8.91	88.6	Clear and colorless	None
09:25	5	120	17.37	0.00	5.17	0.19	3.77	1.27	9.06	86.3	Clear and colorless	None
09:30	5	120	17.37	0.00	5.13	0.189	3.22	0.89	9.03	73.2	Clear and colorless	None
09:35	5	120	17.37	0.00	5.74	0.199	1.31	0.66	9.04	54.9	Clear and colorless	None
09:40	5	120	17.37	0.00	5.94	0.201	0.12	0.58	9.07	44.3	Clear and colorless	None
09:45	5	120	17.37	0.00	6.25	0.203	0.19	0.49	9.55	26.3	Clear and colorless	None
09:50	5	120	17.37	0.00	6.5	0.206	0.21	0.45	10.17	8.5	Clear and colorless	None
09:55	5	120	17.37	0.00	6.52	0.208	0.14	0.42	10.08	6.7	Clear and colorless	None
10:00	5	120	17.37	0.00	6.53	0.207	0.11	0.39	10.04	5.5	Clear and colorless	None
10:05	5	120	17.37	0.00	6.52	0.207	0.09	0.39	10.02	4.4	Clear and colorless	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Used new tubing

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: North west of EW treatment

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

building

Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-2016-5A			**Date**	5/21/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	25C, Sunny, Light breeze
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	14.48	**Total Depth (ft-bmp)**	32.55	**Water Column(ft)**	18	**Gallons in Well**	0.73
MP Elevation		**Pump Intake (ft-bmp)**	27.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:50	**Volumes Purged**		**Sample ID**	SHM-2016-5A-SPR20	**Sampled by**	Desmond Bedard
Purge Start	15:05	**Gallons Purged**					
Purge End	15:50			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:05		120	14.48	0.00	6.79	0.225	34.2	1.21	10.33	52.6	Clear and colorless	No ne
15:10	5	120	14.49	0.00	6.28	0.194	8.89	0.49	10.27	112.2	Clear and colorless	No ne
15:15	5	120	14.49	0.00	5.16	0.176	5.76	0.31	10.04	175.1	Clear and colorless	No ne
15:20	5	120	14.49	0.00	5.26	0.178	4.98	0.26	9.73	163.7	Clear and colorless	No ne
15:25	5	120	14.49	0.00	5.62	0.179	4.61	0.26	9.79	140.6	Clear and colorless	No ne
15:30	5	120	14.49	0.00	5.85	0.178	4.88	0.26	9.87	125.6	Clear and colorless	No ne
15:35	5	120	14.49	0.00	5.98	0.18	4.12	0.22	9.89	114.1	Clear and colorless	No ne
15:40	5	120	14.49	0.00	6.02	0.179	5.07	0.24	9.79	112.3	Clear and colorless	No ne
15:45	5	120	14.49	0.00	5.96	0.18	4.63	0.23	9.6	114.3	Clear and colorless	No ne

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Used tubing found in well

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: North west of EW treatment building

Condition of Well: Good

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHP-2016-5B			**Date**	5/21/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	25C, Sunny, Light breeze
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	14.49	**Total Depth (ft-bmp)**	92.35	**Water Column(ft)**	78	**Gallons in Well**	3.16
MP Elevation		**Pump Intake (ft-bmp)**	42.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:00	**Volumes Purged**		**Sample ID**	SHP-2016-5B-SPR20	**Sampled by**	Desmond Bedard
Purge Start	14:10	**Gallons Purged**					
Purge End	15:00			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:10		160	14.49	0.00	5.68	0.375	23.4	1.28	10.5	113.9	Clear and colorless	None
14:15	5	130	14.5	0.00	5.06	0.353	5.11	1.1	10.64	119.3	Clear and colorless	None
14:20	5	120	14.5	0.00	5.16	0.357	7.66	0.89	10.48	110.7	Clear and colorless	None
14:25	5	120	14.5	0.00	5.39	0.355	3.38	0.68	10.43	94.7	Clear and colorless	None
14:30	5	120	14.5	0.00	5.58	0.35	8.42	0.58	10.44	82.1	Clear and colorless	None
14:35	5	120	14.5	0.00	5.65	0.351	4.97	0.5	10.23	79.9	Clear and colorless	None
14:40	5	120	14.5	0.00	5.61	0.351	5.44	0.45	10.29	81.1	Clear and colorless	None
14:45	5	120	14.5	0.00	6.02	0.352	3.58	0.36	10.21	57.7	Clear and colorless	None
14:50	5	120	14.5	0.00	6.01	0.351	3.54	0.34	10.27	59.4	Clear and colorless	None
14:55	5	120	14.5	0.00	5.99	0.352	3.62	0.33	10.31	61.9	Clear and colorless	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Used new tubing

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: North west of EW treatment building

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: 3753

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EPA-PZ-2012-5A			**Date**	5/22/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	70, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.42	**Total Depth (ft-bmp)**	27.11	**Water Column(ft)**	20	**Gallons in Well**	0.8
MP Elevation		**Pump Intake (ft-bmp)**	23	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:50	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-5A-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	08:45	**Gallons Purged**					
Purge End	10:12			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:50		100	7.46	0.13	7.84	0.106	14.7	4.93	9.71	103.3	Clear	
08:55	5	100	7.46	0.00	5.76	0.105	4.26	4.04	9.51	73.6	Clear	
09:00	5	100	7.46	0.40	5.67	0.108	8.3	4.01	9.46	72.5	Clear	
09:05	5	100	7.46	0.00	5.64	0.107	11.2	3.94	9.33	72.5	Clear	
09:10	5	100	7.46	0.79	5.62	0.108	8.7	3.87	9.6	70.7	Clear	
09:15	5	100	7.46	0.92	5.59	0.107	9.36	3.89	9.59	68.3	Clear	
09:20	5	100	7.46	0.00	5.57	0.107	4.62	3.83	9.5	65.7	Clear	
09:25	5	100	7.46	0.00	5.56	0.107	8	3.76	9.6	62.9	Clear	
09:30	5	100	7.46	1.06	5.56	0.106	5.84	3.78	9.26	60.1	Clear	
09:35	5	100	7.46	0.00	5.56	0.106	1.79	3.8	9.39	57.5	Clear	
09:40	6	100	7.46	0.00	5.57	0.106	2.15	3.74	9.43	54.4	Clear	
09:45	5	100	7.46	0.00	5.57	0.106	2.78	3.73	9.57	52.3	Clear	

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Follow pink flagging tape from behind WWTP, bushwhack/cut a path

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Information

Well Location:	SHL	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EPA-PZ-2012-5B			**Date**	5/22/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	70, sun
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.72	**Total Depth (ft-bmp)**	85.72	**Water Column(ft)**	79	**Gallons in Well**	3.21
MP Elevation		**Pump Intake (ft-bmp)**	80	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:20	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-5B-SPR20	**Sampled by**	Gabriel O'Connor
Purge Start	10:25	**Gallons Purged**					
Purge End	11:35			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:30		100	6.8	0.13	5.88	0.418	25.6	4.18	12.94	-11.9	Clear	No
10:35	5	100	6.81	0.26	6.38	0.461	110	4.12	11.28	-1.7	Clear	No
10:40	5	100	6.81	0.00	6.37	0.462	61	3.94	10.83	6.5	Clear	No
10:45	5	100	6.81	0.53	6.35	0.467	44.7	3.84	11.15	10.5	Clear	No
10:50	5	100	6.81	0.79	6.33	0.467	49.8	3.77	11.1	13	Clear	No
10:55	5	100	6.81	0.00	6.32	0.463	35.2	3.75	10.86	15.5	Clear	No
11:00	5	100	6.81	0.00	6.3	0.464	33.3	3.8	10.88	17.1	Clear	No
11:05	5	100	6.81	0.00	6.29	0.464	24.4	3.62	10.94	19.7	Clear	No
11:09	4	100	6.81	0.00	6.28	0.465	24.7	3.7	11.02	22	Clear	No
11:14	5	100	6.81	0.00	6.25	0.464	23.1	3.69	10.83	24.8	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Follow pink flagging from behind WWTP, bushwhack or cut a path.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: SHL

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EPA-PZ-2012-6A			**Date**	5/22/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	18C, Sunny, Light breeze
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21.77	**Total Depth (ft-bmp)**	33.2	**Water Column(ft)**	11	**Gallons in Well**	0.46
MP Elevation		**Pump Intake (ft-bmp)**	27.2	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:00	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-6A-SPR20	**Sampled by**	Desmond Bedard
Purge Start	10:55	**Gallons Purged**					
Purge End	12:00			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:55		120	21.77	0.00	7.08	0.097	117	11.73	13.64	198	Clear and colorless	None
11:00	5	120	21.77	0.00	4.96	0.082	105	9.91	12.99	339.8	Clear and colorless	None
11:05	5	120	21.77	0.00	3.86	0.082	27.1	8	12.98	390.1	Clear and colorless	None
11:10	5	120	21.77	0.00	4.65	0.082	29.4	8.51	12.89	351.2	Clear and colorless	None
11:15	5	120	21.77	0.00	4.6	0.081	25	8.18	12.67	356.2	Clear and colorless	None
11:20	5	120	21.77	0.00	5.11	0.081	21.9	8.16	12.97	332.4	Clear and colorless	None
11:25	5	120	21.77	0.00	5.82	0.082	17.3	8.09	12.95	297.4	Clear and colorless	None
11:30	5	120	21.77	0.00	6.01	0.083	7.14	8.18	13.59	283.7	Clear and colorless	None
11:35	5	120	21.77	0.00	6.12	0.082	6.99	7.89	13.33	284.4	Clear and colorless	None
11:40	5	120	21.77	0.00	6.04	0.083	5.18	7.98	13.64	292.2	Clear and colorless	None
11:45	5	120	21.77	0.00	6.24	0.083	4.07	8.55	13.38	283.3	Clear and colorless	None
11:50	5	120	21.77	0.00	6.26	0.082	3.99	8.08	13.65	289.8	Clear and colorless	None
11:55	5	120	21.77	0.00	6.3	0.084	4.04	8.01	13.72	281.8	Clear and colorless	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Used tubing found in well

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	West of EW treatment building	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	EPA key

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EPA-PZ-2012-6B			**Date**	5/22/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	12C, Sunny, Light breeze
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21.79	**Total Depth (ft-bmp)**	80.3	**Water Column(ft)**	59	**Gallons in Well**	2.38
MP Elevation		**Pump Intake (ft-bmp)**	48.9	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:40	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-6B-SPR20	**Sampled by**	Desmond Bedard
Purge Start	08:40	**Gallons Purged**					
Purge End	09:40			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:40		160	21.79	0.00	7.57	0.143	23.4	6.25	9.93	185.3	Clear and colorless	None
08:45	5	140	21.81	0.00	4.73	0.093	27.4	2.17	10.17	316	Clear and colorless	None
08:50	5	120	21.8	0.00	4.9	0.099	11.7	1.31	10.8	237.4	Clear and colorless	None
08:55	5	120	21.8	0.00	5.82	0.104	5.48	1.09	11.18	145.2	Clear and colorless	None
09:00	5	120	21.8	0.00	6.08	0.108	9.21	0.81	11.42	99.8	Clear and colorless	None
09:05	5	120	21.8	0.00	6.31	0.111	8.05	0.68	11.34	79.2	Clear and colorless	None
09:10	5	120	21.8	0.00	6.32	0.111	7.93	0.61	11.21	73.6	Clear and colorless	None
09:15	5	120	21.8	0.00	6.34	0.112	8.22	0.54	11.36	69.2	Clear and colorless	None
09:20	5	120	21.8	0.00	6.4	0.114	6.81	0.52	11.27	60.3	Clear and colorless	None
09:25	5	120	21.8	0.00	6.51	0.115	7.03	0.49	11.31	51.6	Clear and colorless	None
09:30	5	120	21.8	0.00	6.54	0.116	6.91	0.46	11.31	50.9	Clear and colorless	None
09:34	4	120	21.8	0.00	6.46	0.117	6.99	0.45	11.24	52.3	Clear and colorless	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Used new tubing

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Information

Well Location:	West of EW treatment building	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	EPA key

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EPA-PZ-2012-7A			**Date**	5/22/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	18C, Sunny, Light breeze
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21.53	**Total Depth (ft-bmp)**	29.1	**Water Column(ft)**	8	**Gallons in Well**	0.31
MP Elevation		**Pump Intake (ft-bmp)**	24.1	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:30	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-7A-SHP20	**Sampled by**	Desmond Bedard
Purge Start	12:45	**Gallons Purged**					
Purge End	13:30			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:45		180	21.53	0.00	6.69	0.529	426	8.41	13.52	212.4	Clear and colorless	None
12:50	5	40	21.59	0.00	4.71	0.557	7.83	6.26	15.29	338	Clear and colorless	None
12:55	5	120	21.58	0.00	5.38	0.583	5.89	5.98	16.8	302.1	Clear and colorless	None
13:00	5	120	21.58	0.00	5.81	0.59	4.67	5.03	16.53	287.4	Clear and colorless	None
13:05	5	120	21.58	0.00	5.82	0.595	4.87	6.06	16.55	288.9	Clear and colorless	None
13:10	5	120	21.58	0.00	5.77	0.6	4.89	5.99	16.51	292.9	Clear and colorless	None
13:15	5	120	21.58	0.00	5.88	0.629	2.58	5.74	16.44	289	Clear and colorless	None
13:20	5	120	21.58	0.00	5.81	0.62	2.53	5.68	16.53	290.7	Clear and colorless	None
13:25	5	120	21.58	0.00	5.79	0.626	2.61	5.64	16.49	291.4	Clear and colorless	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Tubing found in well was clogged; used new tubing

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	On Cook street	Well Locked at Arrival:	no
Condition of Well:	Good	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	EPA-PZ-2012-7B			**Date**	5/22/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	22C, Sunny, Light breeze
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21.6	**Total Depth (ft-bmp)**	61.3	**Water Column(ft)**	40	**Gallons in Well**	1.61
MP Elevation		**Pump Intake (ft-bmp)**	48.6	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:15	**Volumes Purged**		**Sample ID**	EPA-PZ-2012-7B-SPR20	**Sampled by**	Desmond Bedard
Purge Start	14:00	**Gallons Purged**					
Purge End	15:15			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:00		160	21.6	0.00	7.81	0.162	15.2	2.79	15.58	24.2	Clear and colorless	None
14:05	5	120	21.61	0.00	4.41	0.141	6.58	1.77	16.55	167.6	Clear and colorless	None
14:10	5	120	21.61	0.00	6.41	0.145	3.72	0.88	16.445	44.5	Clear and colorless	None
14:25	15	120	21.61	0.00	6.62	0.114	4.86	1.17	12.22	87.9	Clear and colorless	None
14:30	5	120	21.61	0.00	4.03	0.117	6.91	0.61	13.29	192.9	Clear and colorless	None
14:35	5	120	21.61	0.00	4.71	0.114	6.81	0.48	13.07	142.1	Clear and colorless	None
14:40	5	120	21.61	0.00	5.73	0.114	5.29	0.41	13.44	89	Clear and colorless	None
14:45	5	120	21.62	0.00	6.14	0.115	4.98	0.36	13.49	63	Clear and colorless	None
14:50	5	120	21.62	0.00	5.89	0.115	6.53	0.43	13.34	77.6	Clear and colorless	None
14:55	5	100	21.62	0.00	6.29	0.114	5.93	0.39	13.62	52.1	Clear and colorless	None
15:00	5	100	21.61	0.00	6.55	0.117	5.05	0.38	13.61	39.2	Clear and colorless	None
15:05	5	100	21.61	0.00	6.61	0.116	4.99	0.37	13.58	37	Clear and colorless	None
15:10	5	100	21.61	0.00	6.56	0.117	5.06	0.37	13.62	38.6	Clear and colorless	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments: Used tubing found in well

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	On Cook street	Well Locked at Arrival:	no
Condition of Well:	Good	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-13-07			**Date**	5/22/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 70
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	NA
Static Water Level (ft-bmp)	18.68	**Total Depth (ft-bmp)**	37	**Water Column(ft)**	18	**Gallons in Well**	2.98
MP Elevation		**Pump Intake (ft-bmp)**	16	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:25	**Volumes Purged**		**Sample ID**	SHM-13-07-SPR20	**Sampled by**	Diane Champagne
Purge Start	08:31	**Gallons Purged**					
Purge End	09:35			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:34		240	18.69	0.00	6.94	0.485	84.1	2.36	16.32	68.7	No	No
08:38	4	240	18.69	0.00	6.6	0.494	43.7	2.1	16.59	79.9	No	No
08:45	7	240	18.69	0.00	6.2	0.499	28.2	1.81	16.6	106.8	No	No
08:50	5	240	18.69	0.00	5.76	0.497	20.9	1.57	16.68	137.9	No	No
08:55	5	240	18.69	0.00	5.6	0.492	16	1.45	16.7	156.1	No	No
09:00	5	240	18.69	0.00	5.32	0.483	11.9	1.28	16.96	186.1	No	No
09:05	5	240	18.69	0.00	5.59	0.484	11.2	1.06	17.35	197.7	No	No
09:10	5	240	18.69	0.00	5.67	0.478	9.12	1	17.28	196.4	No	No
09:15	5	240	18.69	0.00	5.61	0.477	8.88	0.95	17.23	199.4	No	No
09:20	5	240	18.69	0.00	5.64	0.471	8.63	0.92	17.42	199.4	No	No

Constituent Sampled	Container	Number	Preservative
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: 139

Well Locked at Arrival: no

Condition of Well: Slightly sunken in

Well Locked at Departure: no

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Flush mount

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ARCADIS Design & Consultancy for natural and built assets

Project Number	30048392	**Well ID**	SHM-13-08			**Date**	5/22/2020
Project Name/Location	Devens, Massachusetts					**Weather(°F)**	Sun 75
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	20.2	**Total Depth (ft-bmp)**	65	**Water Column(ft)**	45	**Gallons in Well**	7.28
MP Elevation		**Pump Intake (ft-bmp)**	60	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:10	**Volumes Purged**		**Sample ID**	SHM-13-08-SPR20	**Sampled by**	Diane Champagne
Purge Start	10:17	**Gallons Purged**					
Purge End	11:24			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:20		240	20.21	0.00	5.58	0.285	76.4	5.67	15.2	147.2	None	No
10:25	5	240	20.21	0.00	5.44	0.279	69.9	4.97	15.52	174.9	None	No
10:30	5	240	20.21	0.00	5.28	0.275	45.6	4.14	15.2	209.3	None	No
10:35	5	240	20.21	0.00	5.17	0.297	32.9	3.19	15.08	237.7	None	No
10:40	5	240	20.21	0.00	5.12	0.312	25.9	2.15	15.4	258.2	None	No
10:45	5	240	20.21	0.00	5.25	0.312	13.3	1.87	15.68	255.1	None	No
10:50	5	240	20.21	0.00	5.22	0.313	10.2	1.47	15.71	253.1	None	No
10:55	5	240	20.21	0.00	4.97	0.314	8.6	1.05	15.53	258.9	None	No
11:01	6	240	20.21	0.00	5.02	0.314	7.82	1	15.66	257.2	None	No
11:05	4	240	20.21	0.00	5.05	0.314	7.66	0.99	15.42	252.1	None	No

Constituent Sampled	**Container**	**Number**	**Preservative**
Dissolved Metals			
Alkalinity			
Chloride/Sulfate			
Dissolved Organic Carbon			

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: North impact area

Well Locked at Arrival: no

Condition of Well: Good

Well Locked at Departure: no

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Flush mount

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Attachment 2

Laboratory Results

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

LINKS

Review your project results through TotalAccess

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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: 680-142177-1

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

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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

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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

TestAmerica Laboratories, Inc.
TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

TestAmerica Job ID: 680-142501-1
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:
9/8/2017 2:32:07 PM
Michele Kersey, Project Manager II
(912)354-7858
michele.kersey@testamericainc.com

Designee for

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: 680-142501-1

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

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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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Certification Summary 30

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:
Returned: Via:
Additional Comments:
* = Dissolved Metals include: Fe, Mn (6010); As (6020)

Item No.	Relinquished by/Affiliation	Date	Time	Accepted by/Affiliation	Date	Time
	[signature]	8/25/17	1420	[signature]	8-25-17	1420
	[signature]	8-25-17	1700	[signature]	8/26/17	0845

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: 680-142686-1
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

Review your project results through TotalAccess

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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: 680-142686-1

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
(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: 680-142774-1

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

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Sovereign Consulting

Shepley's Hill (SHL), Devens, MA

AC001.M01

SGS Job Number: JD1172

Sampling Date: 01/03/20

Report to:

Sovereign Consulting
9 Payson Road Suite 150
Foxborough, MA 02035
SPassafaro@SovCon.com

ATTN: Steve Passafaro

Total number of pages in report: 251

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Laura Degenhardt
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

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Test results relate only to samples analyzed.

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how we can serve you better at:
EHS.US.CustomerCare@sgs.com

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SGS North America Inc.

Sample Summary

Sovereign Consulting

Job No: JD1172

Shepley's Hill (SHL), Devens, MA
Project No: AC001.M01

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JD1172-1	01/03/20	07:29	LAP	01/03/20	AQ	Effluent	EFFLUENT

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Sovereign Consulting	**Job No**	JD1172
Site:	Shepley's Hill (SHL), Devens, MA	**Report Date**	1/13/2020 9:54:44 AM

On 01/03/2020, 1 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 1.6 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JD1172 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

Metals Analysis By Method SW846 6020B

Matrix: AQ **Batch ID:** MP19163

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD1056-1FMS, JD1056-1FMSD, JD1056-1FPS, JD1056-1FSDL were used as the QC samples for metals.
- RPD(s) for Serial Dilution for Arsenic are outside control limits for sample MP19163-SD1. Serial dilution indicates possible matrix interference.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Summary of Hits

Job Number: JD1172
Account: Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA
Collected: 01/03/20

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JD1172-1	**EFFLUENT**					
Arsenic		25.8	3.0	2.0	ug/l	SW846 6020B

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Client Sample ID:	EFFLUENT		
Lab Sample ID:	JD1172-1	**Date Sampled:**	01/03/20
Matrix:	AQ - Effluent	**Date Received:**	01/03/20
		Percent Solids:	n/a
Project:	Shepley's Hill (SHL), Devens, MA		

Total Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	25.8	3.0	2.0	0.94	ug/l	2	01/08/20	01/10/20	GT	SW846 6020B [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA48089
(2) Prep QC Batch: MP19163

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody
- QC Evaluation: DOD QSM5.x Limits

SGS

GW

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

FED-EX Tracking # 132543106646 | Bottle Order Control # | SGS Quote # | SGS Job # JD1172

Client / Reporting Information

Company Name: Sovereign Consulting Inc.
Street Address: 9 Payson Road, Suite 150
City / State / Zip: Foxborough MA 02035
Project Contact / E-mail: Steve Passafaro (spassafaro@sovcon.com)
Phone # / Fax #: (508) 339-3200 (508) 339-3248
Sampler(s) Name(s) / Phone #: Sovereign Staff

Project Information

Project Name: Shepley's Hill (SHL), Devens, MA
Street:
City / State: Devens MA
Project #: AC001.M01
Client Purchase Order #:
Project Manager: Steve Passafaro

Billing Information (if different from Report to)

Company Name:
Street Address:
City / State / Zip:
Attention:

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
SED-Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB-Field Blank
EB-Equipment Blank
RB- Rinse Blank
TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	MeOH	NaHSO3	H2SO4	None	DI Water	NaOH	EnCore	Total As - 6020A	LAB USE ONLY
1	Effluent		1/3/20	7:29	LAP	GW	1									X	A17

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [X] 5 Day RUSH - Arsenic Only
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [X] Other See QAPP

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

See Project QAPP for all specific project requirements
5 - Day rush on Arsenic
INITIAL ASESSMENT 2B-PP
SGS ACCUTEST MARLBOR 1/3
LABEL VERIFICATION PP

Sample Inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by	Date Time	Received by	Relinquished by	Date Time	Received by
1 Tomi A. Renaldi	01/03/2020	1 Michael Tech	2 [illegible]	1/3/20 2:00	2 [illegible]
Relinquished by: 3 Fedex	Date Time: 1/4/2020 NJ 9:40	Received by: 3 James Yuan	Relinquished by: 4	Date Time:	Received by: 4
Relinquished by: 5	Date Time:	Received by: 6	Custody Seal # 9572 ☐ Intact ☐ Not intact	Preserved where applicable	On Ice 127 Cooler Temp. 1.9°C IP

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

JD1172: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: JD1172 **Client:** _____ **Project:** _____

Date / Time Received: 1/4/2020 10:40:00 AM **Delivery Method:** _____ **Airbill #'s:** _____

Cooler Temps (Raw Measured) °C: Cooler 1: (1.8);

Cooler Temps (Corrected) °C: Cooler 1: (1.6);

Cooler Security	Y	or N		Y	or N
1. Custody Seals Present:	☑	☐	3. COC Present:	☑	☐
2. Custody Seals Intact:	☑	☐	4. Smpl Dates/Time OK	☑	☐

Cooler Temperature	Y	or N
1. Temp criteria achieved:	☑	☐
2. Cooler temp verification:	IR Gun	
3. Cooler media:	Ice (Bag)	
4. No. Coolers:	1	

Quality Control Preservation	Y	or N	N/A
1. Trip Blank present / cooler:	☐	☑	☐
2. Trip Blank listed on COC:	☐	☑	☐
3. Samples preserved properly:	☑	☐	
4. VOCs headspace free:	☐	☐	☑

Sample Integrity - Documentation	Y	or N
1. Sample labels present on bottles:	☑	☐
2. Container labeling complete:	☑	☐
3. Sample container label / COC agree:	☑	☐

Sample Integrity - Condition	Y	or N
1. Sample recvd within HT:	☑	☐
2. All containers accounted for:	☑	☐
3. Condition of sample:	Intact	

Sample Integrity - Instructions	Y	or N	N/A
1. Analysis requested is clear:	☑	☐	
2. Bottles received for unspecified tests	☐	☑	
3. Sufficient volume recvd for analysis:	☑	☐	
4. Compositing instructions clear:	☐	☐	☑
5. Filtering instructions clear:	☐	☐	☑

Test Strip Lot #s: pH 1-12: 229517 pH 12+: 208717 Other: (Specify) _____ _____

Comments

SM089-03
Rev. Date 12/7/17

JD1172: Chain of Custody
Page 2 of 2

Internal Sample Tracking Chronicle

Sovereign Consulting

Job No: JD1172

Shepley's Hill (SHL), Devens, MA
Project No: AC001.M01

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JD1172-1	Collected: 03-JAN-20 07:29 By: LAP		Received: 03-JAN-20 By: DG			
EFFLUENT						
JD1172-1	SW846 6020B	10-JAN-20 12:40	GT	08-JAN-20	TG	ASMS

SGS Internal Chain of Custody

Job Number: JD1172
Account: SCMAW Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA
Received: 01/03/20

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JD1172-1.1	Secured Storage	Benjamin Gaines	01/07/20 16:37	Retrieve from Storage
JD1172-1.1	Benjamin Gaines	Secured Staging Area	01/07/20 16:37	Return to Storage
JD1172-1.1	Secured Staging Area	Taylor Gorman	01/08/20 07:55	Retrieve from Storage
JD1172-1.1	Taylor Gorman	Secured Storage	01/08/20 11:54	Return to Storage
JD1172-1.1.1	Taylor Gorman	Metals Digestion	01/08/20 11:47	Digestate from JD1172-1.1
JD1172-1.1.1	Metals Digestion	Taylor Gorman	01/08/20 11:48	Digestate from JD1172-1.1
JD1172-1.1.1	Taylor Gorman	Metals Digestate Storage	01/08/20 11:48	Return to Storage

QC Evaluation: DOD QSM5.x Limits

Job Number: JD1172
Account: Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA
Collected: 01/03/20

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
MP19163	SW846 6020B						
MP19163-B2	7440-38-2	Arsenic	BSP	REC	91.5	%	84-116
MP19163-S3*	7440-38-2	Arsenic	MS	REC	91.6	%	84-116
MP19163-S4*	7440-38-2	Arsenic	MSD	REC	90.1	%	84-116
MP19163-S4*	7440-38-2	Arsenic	MSD	RPD	1.6	%	20

* Sample used for QC is not from job JD1172

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries
- IDL and Linear Range Summaries

SGS Instrument Runlog
Inorganics Analyses

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48089
Parameters: As

Time	Sample Description	Dilution Factor	PS Recov	Comments
09:37	MA48089-STD1	1		See rerun, sample intro not stable.
09:42	MA48089-STD2	1		See rerun, sample intro not stable.
09:49	MA48089-STD3	1		STDA
09:55	MA48089-STD4	1		STDB
10:00	MA48089-STD5	1		STDC
10:05	MA48089-STD6	1		STDD
10:10	MA48089-STD7	1		STDE
10:15	MA48089-STD8	1		STDF
10:20	MA48089-STD9	1		STDG
10:25	MA48089-STD10	1		STDH
10:30	MA48089-STD11	1		See rerun, analytical problems
10:34	MA48089-STD12	1		STDI
10:39	MA48089-STD13	1		STDJ
10:46	ZZZZZZ	1		
10:51	MA48089-ICVA1	1		
10:56	MA48089-ICV1	1		
11:01	MA48089-ICB1	1		
11:06	MA48089-CCVA1	1		
11:11	MA48089-CCB1	1		
11:16	MA48089-CRI1	1		Cu out
11:22	MA48089-ICSA1	1		
11:27	MA48089-ICSAB1	1		
11:32	ZZZZZZ	1		
11:57	MA48089-CCVA2	1		
12:02	MA48089-CCB2	1		
12:15	ZZZZZZ	2		
12:20	JD1305-2A	2		(sample used for QC only; not part of login JD1172)
12:25	ZZZZZZ	2		
12:30	ZZZZZZ	2		
12:35	ZZZZZZ	2		
12:40	JD1172-1	2		
---------->	Last reportable sample/prep for job JD1172			
12:45	ZZZZZZ	2		
12:50	MA48089-CCVA3	1		

SGS Instrument Runlog
Inorganics Analyses

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48089
Parameters: As

Time	Sample Description	Dilution Factor	PS Recov	Comments
12:55	MA48089-CCB3	1		
13:00	MP19193-MB1	1		
13:05	MP19193-B1	1		
13:10	MP19193-S1	1		
13:14	MP19193-S2	1		
13:19	JD1295-1	1		(sample used for QC only; not part of login JD1172)
13:24	ZZZZZZ	1		
13:29	ZZZZZZ	1		
13:34	ZZZZZZ	1		
13:39	MA48089-CCVA4	1		
13:44	MA48089-CCB4	1		
13:49	ZZZZZZ	1		
13:54	ZZZZZZ	1		
13:59	ZZZZZZ	1		
14:04	MA48089-CRI2	1		Cu out
14:09	MA48089-CCVA5	1		
14:13	MA48089-CCB5	1		

----------> Last reportable CCB for job JD1172
Refer to raw data for calibration curve and standards.

REPORTED ELEMENTS SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48089
Parameters: As

Time	Sample Description	Element: Dilution	As
10:46	ZZZZZZ	1	
10:51	MA48089-ICVA1	1	X
10:56	MA48089-ICV1	1	
11:01	MA48089-ICB1	1	X
11:06	MA48089-CCVA1	1	X
11:11	MA48089-CCB1	1	X
11:16	MA48089-CRI1	1	X
11:22	MA48089-ICSA1	1	X
11:27	MA48089-ICSAB1	1	X
11:32	ZZZZZZ	1	
11:57	MA48089-CCVA2	1	X
12:02	MA48089-CCB2	1	X
12:15	ZZZZZZ	2	
12:20	JD1305-2A	2	Confirmation
12:25	ZZZZZZ	2	
12:30	ZZZZZZ	2	
12:35	ZZZZZZ	2	
12:40	JD1172-1	2	X
12:45	ZZZZZZ	2	
12:50	MA48089-CCVA3	1	X
12:55	MA48089-CCB3	1	X
13:00	MP19193-MB1	1	
13:05	MP19193-B1	1	
13:10	MP19193-S1	1	
13:14	MP19193-S2	1	
13:19	JD1295-1	1	(a)
13:24	ZZZZZZ	1	
13:29	ZZZZZZ	1	
13:34	ZZZZZZ	1	
13:39	MA48089-CCVA4	1	X
13:44	MA48089-CCB4	1	X
13:49	ZZZZZZ	1	
13:54	ZZZZZZ	1	
		Element:	As

REPORTED ELEMENTS SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48089
Parameters: As

Time	Sample Description	Element: Dilution	As
13:59	ZZZZZZ	1	
14:04	MA48089-CRI2	1	X
14:09	MA48089-CCVA5	1	X
14:13	MA48089-CCB5	1	X

(a) Sample used for QC only; not part of login JD1172.

Element: As

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48089
Parameters: As

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4	Istd#5	Istd#6	Istd#7	Istd#8
09:37	MA48089-STD1	No results reported for the elements associated with this internal standard.							
09:42	MA48089-STD2	No results reported for the elements associated with this internal standard.							
09:49	MA48089-STD3	100	100	100	100	100	100	100	100
09:55	MA48089-STD4	99.149	98.892	100.212	99.09	99.89	100.865	99.237	99.511
10:00	MA48089-STD5	99.94	98.979	98.315	96.802	100.2	99.86	98.195	99.307
10:05	MA48089-STD6	99.896	98.311	97.896	96.233	99.924	99.524	97.647	99.985
10:10	MA48089-STD7	98.37	96.467	96.19	95.071	98.152	97.668	96.558	98.564
10:15	MA48089-STD8	97.954	95.027	94.547	94.142	97.7	97.298	96.091	98.168
10:20	MA48089-STD9	97.226	94.391	95.917	96.396	97.263	97.839	97.922	97.114
10:25	MA48089-STD10	100.101	100.12	98.607	97.57	99.704	100.197	98.912	99.923
10:30	MA48089-STD11	No results reported for the elements associated with this internal standard.							
10:34	MA48089-STD12	101.942	102.795	100.887	98.013	102.175	101.02	98.814	101.922
10:39	MA48089-STD13	99.819	100.16	100.041	98.299	98.963	99.506	98.256	98.568
10:46	ZZZZZZ	100.245	98.145	99.258	97.488	98.639	99.517	98.132	98.278
10:51	MA48089-ICVA1	100.402	97.311	99.775	98.634	100.376	101.227	98.97	100.458
10:56	MA48089-ICV1	99.52	97.182	97.121	95.449	98.684	98.685	96.509	98.644
11:01	MA48089-ICB1	99.318	97.789	98.302	95.758	98.033	99.57	96.682	97.92
11:06	MA48089-CCVA1	98.856	97.96	100.633	97.017	99.18	101.39	98.088	99.647
11:11	MA48089-CCB1	99.159	98.708	100.58	97.617	99.056	101.229	98.282	99.571
11:16	MA48089-CRI1	100.803	99.704	101.266	97.972	100.804	101.876	98.748	100.894
11:22	MA48089-ICSA1	95.3	98.269	100.587	97.641	93.408	97.145	93.758	92.459
11:27	MA48089-ICSAB1	92.876	97.137	100.875	98.058	93.973	97.184	94.351	92.764
11:32	ZZZZZZ	92.739	96.893	95.69	96.967	98.075	98.86	98.966	98.722
11:57	MA48089-CCVA2	96.236	102.004	107.309	106.024	102.702	107.956	104.581	102.283
12:02	MA48089-CCB2	97.165	101.975	99.444	103.078	104.693	99.498	104.423	104.864
12:15	ZZZZZZ	99.64	106.186	111.264	107.371	106.955	111.503	107.209	106.657
12:20	JD1305-2A	No results reported for the elements associated with this internal standard.							
12:25	ZZZZZZ	No results reported for the elements associated with this internal standard.							
12:30	ZZZZZZ	91.94	97.798	100.073	103.303	101.78	103.671	104.937	101.221
12:35	ZZZZZZ	90.161	96.109	98.876	103.406	99.58	102.863	104.559	99.985
12:40	JD1172-1	86.228	92.618	94.693	100.168	96.52	100.094	101.251	96.937
12:45	ZZZZZZ	87.097	95.807	98.964	104.623	99.716	103.178	105.661	99.544
12:50	MA48089-CCVA3	97.54	106.353	110.708	110.668	108.596	113.834	110.798	109.302

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48089
Parameters: As

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4	Istd#5	Istd#6	Istd#7	Istd#8
12:55	MA48089-CCB3	99.209	105.995	109.169	108.995	107.983	110.913	109.473	108.331
13:00	MP19193-MB1	100.67	110.348	108.566	109.203	110.259	111.551	109.785	110.188
13:05	MP19193-B1	102.097	109.316	112.562	109.303	111.545	114.299	109.04	112.186
13:10	MP19193-S1	102.104	105.495	108.822	105.156	108.505	112.736	107.363	108.604
13:14	MP19193-S2	103.878	108.233	109.274	103.883	110.386	113.775	106.366	110.2
13:19	JD1295-1	103.511	108.08	109.63	104.703	109.803	112.361	106.702	109.859
13:24	ZZZZZZ	102.801	105.895	107.559	101.867	106.722	109.467	103.614	106.743
13:29	ZZZZZZ	100.658	102.781	104.295	99.899	104.344	107.134	101.227	104.384
13:34	ZZZZZZ	98.381	99.795	100.985	97.8	100.247	103.843	99.891	100.644
13:39	MA48089-CCVA4	93.825	95.835	91.55	98.368	96.239	94.252	99.122	96.765
13:44	MA48089-CCB4	94.943	97.919	98.521	99.161	97.693	99.942	99.927	97.726
13:49	ZZZZZZ	96.954	98.836	100.931	97.912	100.41	104.196	99.843	100.115
13:54	ZZZZZZ	97.122	99.603	103.874	98.617	98.618	103.38	98.314	99.051
13:59	ZZZZZZ	98.834	98.933	99.875	94.554	100.019	102.075	96.582	99.738
14:04	MA48089-CRI2	92.877	94.013	96.349	96.63	95.034	97.296	98.017	95.122
14:09	MA48089-CCVA5	91.72	95.523	98.396	98.186	95.618	99.424	98.525	95.61
14:13	MA48089-CCB5	94.244	95.67	99.125	95.94	96.636	100.183	97.648	96.446

! = Outside limits.

LEGEND:

Istd#	Parameter	Limits
Istd#1	Lithium	60-125 %
Istd#2	Scandium (45-1)	60-125 %
Istd#3	Scandium (45-2)	60-125 %
Istd#4	Scandium (45-3)	60-125 %
Istd#5	Germanium (72-1)	60-125 %
Istd#6	Germanium (72-2)	60-125 %
Istd#7	Germanium (72-3)	60-125 %
Istd#8	Germanium (74-1)	60-125 %

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48089
Parameters: As

Time	Sample Description	Istd#9	Istd#10	Istd#11	Istd#12	Istd#13	Istd#14	Istd#15	Istd#16
09:37	MA48089-STD1	No results reported for the elements associated with this internal standard.							
09:42	MA48089-STD2	No results reported for the elements associated with this internal standard.							
09:49	MA48089-STD3	100	100	100	100	100	100	100	100
09:55	MA48089-STD4	100.276	99.805	99.828	100.483	99.485	100.853	100.547	99.361
10:00	MA48089-STD5	99.348	99.06	98.005	99.589	100.519	98.471	98.961	97.683
10:05	MA48089-STD6	98.926	98.087	99.042	98.257	100.586	98.726	98.769	97.73
10:10	MA48089-STD7	97.113	97.381	96.162	97.316	100.22	96.578	97.507	97.098
10:15	MA48089-STD8	96.619	97.204	94.715	96.239	98.79	95.826	97.431	95.314
10:20	MA48089-STD9	97.409	98.974	95.566	97.345	100.321	96.669	97.471	96.441
10:25	MA48089-STD10	100.278	100.114	97.525	99.101	101.433	98.506	99.205	97.081
10:30	MA48089-STD11	No results reported for the elements associated with this internal standard.							
10:34	MA48089-STD12	100.234	99.705	98.35	97.372	99.841	100.233	99.865	99.234
10:39	MA48089-STD13	99.347	98.515	93.917	95.897	97.907	95.863	97.461	97.415
10:46	ZZZZZZ	99.502	98.948	97.688	99.131	101.067	98.111	99.354	97.753
10:51	MA48089-ICVA1	101.112	99.491	95.251	95.879	97.771	95.557	100.551	97.166
10:56	MA48089-ICV1	98.297	97.509	97.054	98.064	100.845	98.686	98.51	97.516
11:01	MA48089-ICB1	98.609	97.521	98.419	99.522	100.857	98.923	98.621	97.5
11:06	MA48089-CCVA1	101.043	99.142	94.66	97.418	98.184	95.468	100.213	97.577
11:11	MA48089-CCB1	100.996	99.22	98.847	100.599	101.458	99.399	100.221	98.594
11:16	MA48089-CRI1	101.65	99.275	99.216	100.991	101.636	99.504	101.327	98.548
11:22	MA48089-ICSA1	95.374	92.681	86.249	87.72	86.753	88.511	89.318	94.526
11:27	MA48089-ICSAB1	96.292	93.538	86.319	87.54	87.195	88.424	88.837	93.886
11:32	ZZZZZZ	98.415	100.003	98.285	100.041	102.841	98.907	97.602	98.937
11:57	MA48089-CCVA2	107.624	105.457	100.115	103.062	102.263	102.076	106.287	103.955
12:02	MA48089-CCB2	99.163	104.868	102.94	99.876	105.681	104.317	99.432	104.415
12:15	ZZZZZZ	110.974	107.734	105.683	109.337	108.478	107.819	108.769	106.46
12:20	JD1305-2A	No results reported for the elements associated with this internal standard.							
12:25	ZZZZZZ	No results reported for the elements associated with this internal standard.							
12:30	ZZZZZZ	103.495	105.507	98.464	102.136	108.192	99.979	99.619	101.822
12:35	ZZZZZZ	102.805	105.896	96.017	99.758	105.115	98.654	99.656	100.217
12:40	JD1172-1	100.002	102.396	90.099	95.936	102.112	94.946	95.285	98.103
12:45	ZZZZZZ	102.796	106.664	96.366	102.506	109.059	98.603	98.153	99.039
12:50	MA48089-CCVA3	112.353	111.622	103.246	106.083	108.919	105.528	108.391	105.051

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48089
Parameters: As

Time	Sample Description	Istd#9	Istd#10	Istd#11	Istd#12	Istd#13	Istd#14	Istd#15	Istd#16
12:55	MA48089-CCB3	110.523	109.845	105.372	108.958	112.419	105.441	106.75	104.793
13:00	MP19193-MB1	110.834	110.311	107.38	108.505	111.883	108.754	106.55	105.901
13:05	MP19193-B1	114.004	110.621	106.915	108.272	108.94	107.109	110.12	107.039
13:10	MP19193-S1	111.969	108.524	103.307	106.793	107.266	105.454	109.632	103.519
13:14	MP19193-S2	113.225	107.729	103.664	106.289	107.59	105.447	110.254	104.128
13:19	JD1295-1	112.517	107.333	105.235	108.387	107.09	106.751	108.959	103.695
13:24	ZZZZZZ	109.105	104.195	102.111	103.054	103.525	104.513	106.61	102.528
13:29	ZZZZZZ	106.466	101.823	99.404	102.669	101.803	101.903	104.875	100.731
13:34	ZZZZZZ	103.12	100.15	96.447	98.783	100.638	98.592	101.55	98.412
13:39	MA48089-CCVA4	93.763	100.297	92.795	89.588	99.886	95.77	92.049	96.789
13:44	MA48089-CCB4	100.432	100.218	96.725	100.404	103.186	98.742	98.638	97.612
13:49	ZZZZZZ	103.874	100.808	97.695	100.165	100.776	98.961	102.071	99.331
13:54	ZZZZZZ	103.357	98.635	92.576	94.826	95.389	96.596	101.528	98.365
13:59	ZZZZZZ	101.45	97.528	96.639	98.316	99.233	98.648	100.279	97.157
14:04	MA48089-CRI2	97.342	98.612	93.555	98.178	102.148	95.965	96.548	94.991
14:09	MA48089-CCVA5	99.428	99.53	92.05	94.993	99.498	93.644	97.735	96.37
14:13	MA48089-CCB5	99.872	98.167	96.068	101.232	100.909	98.412	99.855	96.83

! = Outside limits.

LEGEND:

Istd#	Parameter	Limits
Istd#9	Germanium (74-2)	60-125 %
Istd#10	Germanium (74-3)	60-125 %
Istd#11	Rhodium (103-1)	60-125 %
Istd#12	Rhodium (103-2)	60-125 %
Istd#13	Rhodium (103-3)	60-125 %
Istd#14	Indium (115-1)	60-125 %
Istd#15	Indium (115-2)	60-125 %
Istd#16	Terbium (159-1)	60-125 %

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48089
Parameters: As

Time	Sample Description	Istd#17	Istd#18	Istd#19	Istd#20	Istd#21	Istd#22
09:37	MA48089-STD1	No results reported for the elements associated with this internal standard.					
09:42	MA48089-STD2	No results reported for the elements associated with this internal standard.					
09:49	MA48089-STD3	100	100	100	100	100	100
09:55	MA48089-STD4	99.594	100.372	99.586	99.296	99.118	99.917
10:00	MA48089-STD5	98.896	100.319	98.281	98.989	97.675	99.144
10:05	MA48089-STD6	98.939	100.954	98.977	98.505	97.986	98.555
10:10	MA48089-STD7	97.081	100.629	97.476	96.283	95.865	97.195
10:15	MA48089-STD8	96.021	100.378	95.671	95.488	96.425	95.912
10:20	MA48089-STD9	97.254	101.734	96.618	96.418	96.155	97.467
10:25	MA48089-STD10	98.55	102.839	98.157	97.636	96.956	96.727
10:30	MA48089-STD11	No results reported for the elements associated with this internal standard.					
10:34	MA48089-STD12	99.161	102.71	100.911	98.138	96.516	96.447
10:39	MA48089-STD13	98.409	101.577	97.78	97.581	92.671	94.576
10:46	ZZZZZZ	99.315	101.83	99.276	98.379	97.246	99.43
10:51	MA48089-ICVA1	98.034	101.672	98.182	97.339	94.095	94.969
10:56	MA48089-ICV1	98.333	101.257	97.382	98.057	96.645	98.57
11:01	MA48089-ICB1	98.454	101.651	97.814	97.917	96.615	98.503
11:06	MA48089-CCVA1	98.746	101.901	98.096	98.045	94.038	95.374
11:11	MA48089-CCB1	100.321	101.981	99.111	99.286	97.322	99.844
11:16	MA48089-CRI1	99.599	102.414	98.788	99.946	97.618	99.881
11:22	MA48089-ICSA1	95.219	95.609	95.208	93.951	84.976	82.042
11:27	MA48089-ICSAB1	93.623	95.999	95.095	93.247	83.997	79.195
11:32	ZZZZZZ	98.313	104.245	99.235	98.015	97.364	97.979
11:57	MA48089-CCVA2	103.847	104.461	105.06	104.265	99.574	100.306
12:02	MA48089-CCB2	97.718	105.146	104.636	97.329	102.773	95.136
12:15	ZZZZZZ	107.947	106.625	106.978	106.641	104.088	105.484
12:20	JD1305-2A	No results reported for the elements associated with this internal standard.					
12:25	ZZZZZZ	No results reported for the elements associated with this internal standard.					
12:30	ZZZZZZ	100.742	108.993	103.128	101.835	99.351	99.536
12:35	ZZZZZZ	100.048	108.18	100.929	99.106	96.955	95.973
12:40	JD1172-1	96.032	106.616	99.046	96.305	92.995	92.936
12:45	ZZZZZZ	100.49	109.457	100.87	100.201	98.014	99.078
12:50	MA48089-CCVA3	105.142	110.232	106.577	105.138	100.628	100.014

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48089
Parameters: As

Time	Sample Description	Istd#17	Istd#18	Istd#19	Istd#20	Istd#21	Istd#22
12:55	MA48089-CCB3	105.105	110.164	104.753	104.677	103.032	104.067
13:00	MP19193-MB1	103.991	109.876	107.119	103.995	102.956	101.973
13:05	MP19193-B1	106.263	109.375	107.292	105.314	102.558	103.507
13:10	MP19193-S1	103.949	107.279	104.525	104.694	102.644	103.167
13:14	MP19193-S2	103.762	106.975	104.466	103.946	102.868	103.665
13:19	JD1295-1	105.307	106.811	103.589	105.341	103.363	104.574
13:24	ZZZZZZ	103.196	105.975	103.499	103.196	99.941	100.376
13:29	ZZZZZZ	101.893	105.539	101.363	101.27	98.465	100.696
13:34	ZZZZZZ	99.268	104.313	98.531	98.749	96.206	97.131
13:39	MA48089-CCVA4	91.426	103.399	97.308	91.119	92.809	87.626
13:44	MA48089-CCB4	99.1	105.177	98.65	99.201	97.343	98.222
13:49	ZZZZZZ	100.042	102.528	100.451	99.846	98.534	99.29
13:54	ZZZZZZ	98.886	101.817	99.787	100.144	91.578	93.012
13:59	ZZZZZZ	98.64	101.08	97.677	98.417	95.565	98.412
14:04	MA48089-CRI2	97.728	104.484	96.669	97.65	93.211	96.739
14:09	MA48089-CCVA5	97.014	103.303	98.127	96.78	92.17	94.017
14:13	MA48089-CCB5	99.712	102.952	97.776	100.414	95.48	97.962

! = Outside limits.

LEGEND:

Istd#	Parameter	Limits
Istd#17	Terbium (159-2)	60-125 %
Istd#18	Terbium (159-3)	60-125 %
Istd#19	Holmium (165-1)	60-125 %
Istd#20	Holmium (165-2)	60-125 %
Istd#21	Bismuth (209-1)	60-125 %
Istd#22	Bismuth (209-2)	60-125 %

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
QC Limits: result < 1/2 RL Run ID: MA48089 Units: ug/l

Time:				11:01		11:11		12:02	
Sample ID:				ICB1		CCB1		CCB2	
Metal	RL	IDL	LOD	raw	final	raw	final	raw	final
Aluminum	25	.28	20						
Antimony	2.0	.094	1.5						
Arsenic	1.0	.013	1.0	0.0206	<1.5	0.0322	<1.5	0.0241	<1.5
Barium	1.0	.008	0.50						
Beryllium	0.50	.004	0.25						
Boron	25	.65	20						
Cadmium	0.50	.004	2.0						
Calcium	250	6.1	50						
Chromium	4.0	.014	3.0						
Cobalt	0.50	.002	0.25						
Copper	4.0	.021	4.0						
Iron	25	.43	13						
Lead	0.50	.009	1.0						
Magnesium	250	.15	130						
Manganese	1.0	.007	1.0						
Molybdenum	1.0	.015	0.50						
Nickel	4.0	.017	3.0						
Potassium	250	.71	50						
Selenium	1.0	.072	0.50						
Silver	1.0	.004	0.50						
Sodium	250	1	100						
Strontium	5.0	.003	5.0						
Thallium	0.50	.004	0.50						
Tin	5.0	.071	2.5						
Titanium	1.0	.035	1.0						
Vanadium	1.5	.009	1.0						
Zinc	10	.029	7.5						

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
QC Limits: result < 1/2 RL Run ID: MA48089 Units: ug/l

Time:				12:55		13:44		14:13	
Sample ID:				CCB3		CCB4		CCB5	
Metal	RL	IDL	LOD	raw	final	raw	final	raw	final
Aluminum	25	.28	20						
Antimony	2.0	.094	1.5						
Arsenic	1.0	.013	1.0	-0.000905	<1.5	0.00471	<1.0	0.0122	<1.0
Barium	1.0	.008	0.50						
Beryllium	0.50	.004	0.25						
Boron	25	.65	20						
Cadmium	0.50	.004	2.0						
Calcium	250	6.1	50						
Chromium	4.0	.014	3.0						
Cobalt	0.50	.002	0.25						
Copper	4.0	.021	4.0						
Iron	25	.43	13						
Lead	0.50	.009	1.0						
Magnesium	250	.15	130						
Manganese	1.0	.007	1.0						
Molybdenum	1.0	.015	0.50						
Nickel	4.0	.017	3.0						
Potassium	250	.71	50						
Selenium	1.0	.072	0.50						
Silver	1.0	.004	0.50						
Sodium	250	1	100						
Strontium	5.0	.003	5.0						
Thallium	0.50	.004	0.50						
Tin	5.0	.071	2.5						
Titanium	1.0	.035	1.0						
Vanadium	1.5	.009	1.0						
Zinc	10	.029	7.5						

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
QC Limits: 90 to 110 % Recovery Run ID: MA48089 Units: ug/l

Time:		10:51			10:56			11:06	
Sample ID:	ICVA	ICVA1		ICV	ICV1		CCVA	CCVA1	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	60	64.3	107.2				50	49.0	98.0
Barium	anr								
Beryllium	anr								
Boron									
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	anr								
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Potassium	anr								
Selenium	anr								
Silver	anr								
Sodium	anr								
Strontium									
Thallium	anr								
Tin									
Titanium									
Vanadium	anr								
Zinc	anr								

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
QC Limits: 90 to 110 % Recovery Run ID: MA48089 Units: ug/l

Time:		11:57			12:50			13:39	
Sample ID:	CCVA	CCVA2		CCVA	CCVA3		CCVA	CCVA4	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	50	49.4	98.8	50	49.8	99.6	50	54.0	108.0
Barium	anr								
Beryllium	anr								
Boron									
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	anr								
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Potassium	anr								
Selenium	anr								
Silver	anr								
Sodium	anr								
Strontium									
Thallium	anr								
Tin									
Titanium									
Vanadium	anr								
Zinc	anr								

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
QC Limits: 90 to 110 % Recovery Run ID: MA48089 Units: ug/l

Time:		14:09	
Sample ID:	CCVA	CCVA5	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	50	49.4	98.8
Barium	anr		
Beryllium	anr		
Boron			
Cadmium	anr		
Calcium	anr		
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	anr		
Lead	anr		
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Potassium	anr		
Selenium	anr		
Silver	anr		
Sodium	anr		
Strontium			
Thallium	anr		
Tin			
Titanium			
Vanadium	anr		
Zinc	anr		

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
QC Limits: 80 to 120 % Recovery Run ID: MA48089 Units: ug/l

Time:			11:16		14:04	
Sample ID:	CRI	CRIA	CRI1		CRI2	
Metal	True	True	Results	% Rec	Results	% Rec
Aluminum	25	25	anr			
Antimony	2.0	0.25	anr			
Arsenic	0.50	0.50	0.481	96.2	0.423	84.6
Barium	1.0	0.50	anr			
Beryllium	0.50	0.25	anr			
Boron	25	2.5				
Cadmium	0.50	0.25	anr			
Calcium	250	125	anr			
Chromium	1.0	2.0	anr			
Cobalt	0.50	0.25	anr			
Copper	2.0	2.0	anr			
Iron	25	25	anr			
Lead	0.50	0.25	anr			
Magnesium	250	125	anr			
Manganese	1.0	0.25	anr			
Molybdenum	1.0	0.50				
Nickel	1.0	2.0	anr			
Potassium	250	125	anr			
Selenium	0.50	0.50	anr			
Silver	0.50	1.0	anr			
Sodium	250	125	anr			
Strontium	5.0	0.50				
Thallium	0.50	0.25	anr			
Tin	5.0	0.50				
Titanium	1.0	0.50				
Vanadium	1.0	2.0	anr			
Zinc	5.0	2.0	anr			

(*) Outside of QC limits
(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M1L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
QC Limits: 80 to 120 % Recovery Run ID: MA48089 Units: ug/l

Time:			11:22		11:27	
Sample ID:	ICSA	ICSAB	ICSA1		ICSAB1	
Metal	True	True	Results	% Rec	Results	% Rec
Aluminum	100000	100000	98200	98.2	99900	99.9
Antimony			0.560		0.533	
Arsenic		20	0.0588		19.4	97.0
Barium			0.178		0.243	
Beryllium			0.00316		0.00339	
Boron		50	2.32		54.3	108.6
Cadmium		20	-0.264		18.5	92.5
Calcium	100000	100000	96500	96.5	100000	100.0
Chromium		20	1.02		19.1	95.5
Cobalt		20	0.185		18.3	91.5
Copper		20	-0.881		15.9	79.5*(a)
Iron	100000	100000	90000	90.0	91300	91.3
Lead			0.0785		0.118	
Magnesium	100000	100000	94200	94.2	95000	95.0
Manganese		20	0.596		19.1	95.5
Molybdenum	2000	2000	2110	105.5	2180	109.0
Nickel		20	0.938		17.9	89.5
Potassium	100000	100000	97700	97.7	99000	99.0
Selenium		20	0.184		21.4	107.0
Silver		20	0.0219		19.5	97.5
Sodium	100000	100000	95800	95.8	97000	97.0
Strontium	2000	2000	2010	100.5	1860	93.0
Thallium			0.00824		0.00507	
Tin	2000	2000	2030	101.5	2000	100.0
Titanium	2000	2000	1830	91.5	1860	93.0
Vanadium		20	0.0302		19.5	97.5
Zinc		20	0.405		16.3	81.5

(*) Outside of QC limits
(anr) Analyte not requested
(a) No samples reported for this element in the area bracketed by this QC.

SGS Instrument Runlog
Inorganics Analyses

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Dilution Factor	PS Recov	Comments
14:28	MA48091-STD1	1		See rerun, sample intro not stable.
14:32	MA48091-STD2	1		See rerun, sample intro not stable.
14:37	MA48091-STD3	1		STDA
14:43	MA48091-STD4	1		STDB
14:47	MA48091-STD5	1		STDC
14:52	MA48091-STD6	1		STDD
14:57	MA48091-STD7	1		STDE
15:02	MA48091-STD8	1		STDF
15:07	MA48091-STD9	1		STDG
15:12	MA48091-STD10	1		STDH
15:17	MA48091-STD11	1		STDI
15:22	MA48091-STD12	1		STDJ
15:27	ZZZZZZ	1		
15:32	ZZZZZZ	1		
15:36	MA48091-ICV1	1		60ppb Al.
15:43	MA48091-ICVA1	1		
15:49	MA48091-ICB1	1		
15:54	MA48091-CCVA1	1		
15:59	MA48091-CCB1	1		
16:04	MA48091-CRI1	1		
16:13	MA48091-ICSA1	1		
16:17	MA48091-ICSAB1	1		
16:22	ZZZZZZ	1		
16:28	MA48091-CCVA2	1		
16:33	MA48091-CCB2	1		
16:38	MP19163-MB1	2		
16:42	MP19163-B2	2		
16:47	MP19163-S3	2		
16:52	MP19163-S4	2		
16:57	JD1056-1F	2		(sample used for QC only; not part of login JD1172)
17:02	MP19163-SD1	10		
17:07	MP19163-PS1	2		
----------> Last reportable sample/prep for job JD1172				
17:12	ZZZZZZ	20		

SGS Instrument Runlog
Inorganics Analyses

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

	Time	Sample Description	Dilution Factor	PS Recov	Comments
	17:17	MA48091-CCVA3	1		
	17:22	MA48091-CCB3	1		
---------->	Last reportable CCB for job JD1172				
	17:27	ZZZZZZ	100		
	17:32	ZZZZZZ	20		
	17:36	ZZZZZZ	20		
	17:41	ZZZZZZ	20		
	17:46	ZZZZZZ	100		
	17:51	ZZZZZZ	2		
	17:56	ZZZZZZ	20		
	18:01	ZZZZZZ	2		
	18:06	MA48091-CCVA4	1		
	18:11	MA48091-CCB4	1		
	18:16	ZZZZZZ	20		
	18:20	ZZZZZZ	2		
	18:25	ZZZZZZ	10		
	18:30	ZZZZZZ	100		
	18:35	ZZZZZZ	2		
	18:40	ZZZZZZ	25		
	18:45	ZZZZZZ	500		
	18:50	ZZZZZZ	2		
	18:55	MA48091-CCVA5	1		
	19:00	MA48091-CCB5	1		
	19:05	ZZZZZZ	10		
	19:10	ZZZZZZ	2		
	19:14	ZZZZZZ	10		
	19:19	ZZZZZZ	100		
	19:24	ZZZZZZ	2		
	19:29	ZZZZZZ	20		
	19:34	ZZZZZZ	100		
	19:39	MA48091-CCVA6	1		
	19:44	MA48091-CCB6	1		
	19:49	ZZZZZZ	1		
	19:54	ZZZZZZ	1		

SGS Instrument Runlog
Inorganics Analyses

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Dilution Factor	PS Recov	Comments
19:59	ZZZZZZ	1		
20:04	ZZZZZZ	1		
20:09	ZZZZZZ	1		
20:13	ZZZZZZ	1		
20:18	ZZZZZZ	1		
20:23	ZZZZZZ	1		
20:28	ZZZZZZ	1		
20:33	ZZZZZZ	1		
20:38	MA48091-CCVA7	1		
20:43	MA48091-CCB7	1		
20:48	ZZZZZZ	2		
20:53	ZZZZZZ	2		
20:58	ZZZZZZ	2		
21:03	ZZZZZZ	5		
21:08	ZZZZZZ	5		
21:13	ZZZZZZ	5		
21:17	MA48091-CCVA8	1		
21:22	MA48091-CCB8	1		
21:27	MP19215-MB1	1		
21:32	MP19215-B1	1		
21:37	MP19215-S1	1		Tip missed cup.
21:42	MP19215-S2	1		Tip missed cup.
21:47	JD1293-1	1		(sample used for QC only; not part of login JD1172)
21:52	ZZZZZZ	1		
21:57	ZZZZZZ	1		
22:02	MA48091-CCVA9	1		
22:07	MA48091-CCB9	1		

Refer to raw data for calibration curve and standards.

REPORTED ELEMENTS SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Element: Dilution	As	
15:27	ZZZZZZ	1		
15:32	ZZZZZZ	1		
15:36	MA48091-ICV1	1		
15:43	MA48091-ICVA1	1	X	
15:49	MA48091-ICB1	1	X	
15:54	MA48091-CCVA1	1	X	
15:59	MA48091-CCB1	1	X	
16:04	MA48091-CRI1	1	X	
16:13	MA48091-ICSA1	1	X	
16:17	MA48091-ICSAB1	1	X	
16:22	ZZZZZZ	1		
16:28	MA48091-CCVA2	1	X	
16:33	MA48091-CCB2	1	X	
16:38	MP19163-MB1	2	X	
16:42	MP19163-B2	2	X	
16:47	MP19163-S3	2	X	
16:52	MP19163-S4	2	X	
16:57	JD1056-1F	2	X	(a)
17:02	MP19163-SD1	10	X	
17:07	MP19163-PS1	2	X	
17:12	ZZZZZZ	20		
17:17	MA48091-CCVA3	1	X	
17:22	MA48091-CCB3	1	X	
17:27	ZZZZZZ	100		
17:32	ZZZZZZ	20		
17:36	ZZZZZZ	20		
17:41	ZZZZZZ	20		
17:46	ZZZZZZ	100		
17:51	ZZZZZZ	2		
17:56	ZZZZZZ	20		
18:01	ZZZZZZ	2		
18:06	MA48091-CCVA4	1	X	
18:11	MA48091-CCB4	1	X	
		Element:	As	

REPORTED ELEMENTS SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Element: Dilution	As
18:16	ZZZZZZ	20	
18:20	ZZZZZZ	2	
18:25	ZZZZZZ	10	
18:30	ZZZZZZ	100	
18:35	ZZZZZZ	2	
18:40	ZZZZZZ	25	
18:45	ZZZZZZ	500	
18:50	ZZZZZZ	2	
18:55	MA48091-CCVA5	1	X
19:00	MA48091-CCB5	1	X
19:05	ZZZZZZ	10	
19:10	ZZZZZZ	2	
19:14	ZZZZZZ	10	
19:19	ZZZZZZ	100	
19:24	ZZZZZZ	2	
19:29	ZZZZZZ	20	
19:34	ZZZZZZ	100	
19:39	MA48091-CCVA6	1	X
19:44	MA48091-CCB6	1	X
19:49	ZZZZZZ	1	
19:54	ZZZZZZ	1	
19:59	ZZZZZZ	1	
20:04	ZZZZZZ	1	
20:09	ZZZZZZ	1	
20:13	ZZZZZZ	1	
20:18	ZZZZZZ	1	
20:23	ZZZZZZ	1	
20:28	ZZZZZZ	1	
20:33	ZZZZZZ	1	
20:38	MA48091-CCVA7	1	
20:43	MA48091-CCB7	1	
20:48	ZZZZZZ	2	
20:53	ZZZZZZ	2	
		Element:	As

REPORTED ELEMENTS SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Element: As Dilution	
20:58	ZZZZZZ	2	
21:03	ZZZZZZ	5	
21:08	ZZZZZZ	5	
21:13	ZZZZZZ	5	
21:17	MA48091-CCVA8	1	
21:22	MA48091-CCB8	1	
21:27	MP19215-MB1	1	
21:32	MP19215-B1	1	
21:37	MP19215-S1	1	Tip missed cup.
21:42	MP19215-S2	1	Tip missed cup.
21:47	JD1293-1	1	Tip missed cup.
21:52	ZZZZZZ	1	
21:57	ZZZZZZ	1	
22:02	MA48091-CCVA9	1	
22:07	MA48091-CCB9	1	

(a) Sample used for QC only; not part of login JD1172.

Element: As

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4	Istd#5	Istd#6	Istd#7	Istd#8
14:28	MA48091-STD1	No results reported for the elements associated with this internal standard.							
14:32	MA48091-STD2	No results reported for the elements associated with this internal standard.							
14:37	MA48091-STD3	100	100	100	100	100	100	100	100
14:43	MA48091-STD4	99.303	100.511	100.312	99.783	100.091	99.819	101.015	100.295
14:47	MA48091-STD5	99.664	100.399	99.47	99.422	100.459	99.736	101.087	100.309
14:52	MA48091-STD6	99.066	98.092	99.81	100.12	98.916	100.286	101.017	98.867
14:57	MA48091-STD7	99.349	98.325	99.516	99.428	100.361	99.428	100.245	100.025
15:02	MA48091-STD8	99.692	99.203	100.741	100.046	101.026	101.541	101.122	101.008
15:07	MA48091-STD9	98.679	98.91	100.064	100.602	98.9	100.208	101.158	98.968
15:12	MA48091-STD10	98.965	98.986	99.543	99.926	98.327	98.95	100.706	98.489
15:17	MA48091-STD11	99.453	99.465	100.945	100.526	98.918	100.049	100.208	98.365
15:22	MA48091-STD12	98.948	99.906	95.859	99.92	97.951	92.515	99.348	98.2
15:27	ZZZZZZ	99.39	99.669	99.155	98.295	99.892	99.567	99.523	99.814
15:32	ZZZZZZ	100.689	101.426	102.707	100.578	101.408	102.359	100.859	101.945
15:36	MA48091-ICV1	98.117	99.338	99.977	98.58	99.026	100.513	99.185	99.201
15:43	MA48091-ICVA1	100.198	101.167	103.763	101.112	101.432	103.172	101.537	101.916
15:49	MA48091-ICB1	99.731	101.386	100.901	99.436	99.989	100.774	100.209	100.449
15:54	MA48091-CCVA1	101.086	101.692	104.473	100.337	101.958	103.085	101.305	101.785
15:59	MA48091-CCB1	101.24	101.192	101.87	98.179	101.156	101.839	99.615	101.64
16:04	MA48091-CRI1	100.63	101.082	100.982	98.265	99.629	100.562	100.203	100.232
16:13	MA48091-ICSA1	92.961	97.209	100.3	95.209	91.208	94.789	90.986	91.031
16:17	MA48091-ICSAB1	87.492	92.954	96.18	92.878	89.949	91.593	89.946	88.871
16:22	ZZZZZZ	87.239	88.589	87.59	90.189	90.086	90.264	92.154	90.584
16:28	MA48091-CCVA2	87.228	90.217	91.487	92.956	91.718	93.299	94.36	91.936
16:33	MA48091-CCB2	88.028	90.033	90.664	93.027	91.42	92.609	94.658	91.853
16:38	MP19163-MB1	80.688	84.566	84.678	91.308	86.907	88.327	92.668	87.095
16:42	MP19163-B2	81.223	84.98	86.595	92.37	87.162	89.156	93.28	87.707
16:47	MP19163-S3	80.17	85.042	87.568	95.761	89.537	91.399	96.846	89.548
16:52	MP19163-S4	79.26	85.653	89.624	96.968	90.208	93.151	98.997	90.632
16:57	JD1056-1F	78.96	87.54	89.974	97.877	91.327	93.585	100.571	90.738
17:02	MP19163-SD1	88.143	95.523	96.054	99.336	96.654	97.95	100.814	96.637
17:07	MP19163-PS1	80.912	89.462	91.108	97.824	92.689	94.047	98.835	92.795
17:12	ZZZZZZ	84.074	92.383	93.88	94.699	91.567	92.806	93.045	91.091

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4	Istd#5	Istd#6	Istd#7	Istd#8
17:17	MA48091-CCVA3	83.362	90.584	93.454	97.243	92.777	95.058	97.86	93.119
17:22	MA48091-CCB3	84.874	92.006	92.088	96.186	93.358	94.411	98.228	93.373
17:27	ZZZZZZ	83.553	92.656	93.522	96.432	92.312	93.998	96.054	92.657
17:32	ZZZZZZ	82.989	93.2	93.964	97.642	92.957	95.253	98.615	93.2
17:36	ZZZZZZ	80.624	91.875	93.567	96.806	91.869	94.193	96.672	91.432
17:41	ZZZZZZ	80.322	89.636	93.221	94.648	87.88	91.815	92.889	88.064
17:46	ZZZZZZ	81.139	90.038	91.433	95.849	90.48	91.289	96.106	90.195
17:51	ZZZZZZ	59.169 !a	85.408	87.693	93.923	85.317	88.422	90.508	85.512
17:56	ZZZZZZ	84.489	92.276	92.167	97.256	94.362	94.036	99.153	94.563
18:01	ZZZZZZ	61.067 !a	86.043	87.796	92.561	86.61	89.312	90.066	87.034
18:06	MA48091-CCVA4	87.887	91.038	92.591	96.119	94.656	95.034	97.696	94.738
18:11	MA48091-CCB4	89.438	91.615	90.554	95.189	93.965	93.341	97.243	93.769
18:16	ZZZZZZ	86.017	91.531	91.331	94.753	92.975	92.252	96.717	93.188
18:20	ZZZZZZ	78.137	85.128	84.355	90.761	85.871	86.779	90.386	85.958
18:25	ZZZZZZ	88.414	92.086	91.003	94.875	92.566	92.732	96.86	93.652
18:30	ZZZZZZ	90.811	94.413	93.709	96.875	96.163	96.447	99.027	96.778
18:35	ZZZZZZ	79.447	86.255	85.521	92.275	87.544	87.949	91.926	87.993
18:40	ZZZZZZ	89.7	92.701	91.41	94.935	94.625	93.167	97.078	94.81
18:45	ZZZZZZ	91.179	93.889	91.351	94.469	95.668	93.479	97.207	95.657
18:50	ZZZZZZ	83.141	87.183	85.544	93.633	91.781	89.975	96.353	92.187
18:55	MA48091-CCVA5	89.474	91.546	92.283	95.574	94.467	93.532	96.729	94.747
19:00	MA48091-CCB5	91.089	93.457	90.84	93.384	94.788	93.136	95.295	95.189
19:05	ZZZZZZ	89.95	93.409	90.617	94.188	95.061	92.169	95.879	94.982
19:10	ZZZZZZ	80.527	86.248	86.196	92.097	87.751	88.118	91.884	87.426
19:14	ZZZZZZ	89.078	94.222	92.87	97.609	96.126	95.248	98.423	96.012
19:19	ZZZZZZ	93.246	97.592	94.918	97.725	99.322	97.225	99.779	99.185
19:24	ZZZZZZ	81.996	88.581	86.452	92.507	90.252	89.441	92.591	90.257
19:29	ZZZZZZ	90.433	94.571	92.349	95.506	96.794	95.527	97.072	97.729
19:34	ZZZZZZ	91.366	94.835	92.899	94.96	96.79	94.561	96.911	97.125
19:39	MA48091-CCVA6	89.383	92.691	91.342	94.237	95.235	93.531	96.018	95.63
19:44	MA48091-CCB6	91.182	93.192	92.984	95.281	95.079	93.981	96.422	95.03
19:49	ZZZZZZ	91.449	94.787	92.52	96.212	96.689	94.265	96.672	96.882
19:54	ZZZZZZ	91.413	94.792	92.34	94.646	95.144	93.211	95.952	95.731

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4	Istd#5	Istd#6	Istd#7	Istd#8
19:59	ZZZZZZ	89.672	93.911	91.246	94.346	94.557	91.868	95.699	94.929
20:04	ZZZZZZ	90.733	93.66	90.484	94.199	94.511	91.732	95.243	94.442
20:09	ZZZZZZ	90.945	92.781	90.592	93.109	94.188	91.88	94.106	94.773
20:13	ZZZZZZ	90.377	93.312	90.935	92.939	94.606	92.34	94.033	94.524
20:18	ZZZZZZ	89.788	93.76	90.777	93.364	94.206	92.807	94.802	94.571
20:23	ZZZZZZ	89.729	93.294	92.179	94.662	94.606	92.762	94.79	94.747
20:28	ZZZZZZ	89.37	92.969	89.892	92.953	93.854	91.292	94.566	94.187
20:33	ZZZZZZ	88.927	92.681	90.43	93.323	93.56	91.4	94.837	94.333
20:38	MA48091-CCVA7	No results reported for the elements associated with this internal standard.							
20:43	MA48091-CCB7	No results reported for the elements associated with this internal standard.							
20:48	ZZZZZZ	90.017	91.939	88.584	89.934	93.768	90.662	91.201	93.838
20:53	ZZZZZZ	82.321	86.615	84.831	92.15	89.906	87.784	92.811	90.186
20:58	ZZZZZZ	92.806	93.851	90.427	91.759	95.918	92.427	93.426	96.296
21:03	ZZZZZZ	89.543	91.716	89.164	91.533	93.301	90.283	93.036	93.809
21:08	ZZZZZZ	87.969	90.482	89.222	93.608	92.863	91.395	94.723	93.448
21:13	ZZZZZZ	93.276	94.004	92.045	90.895	95.85	93.323	93.407	96.079
21:17	MA48091-CCVA8	No results reported for the elements associated with this internal standard.							
21:22	MA48091-CCB8	No results reported for the elements associated with this internal standard.							
21:27	MP19215-MB1	No results reported for the elements associated with this internal standard.							
21:32	MP19215-B1	No results reported for the elements associated with this internal standard.							
21:37	MP19215-S1	No results reported for the elements associated with this internal standard.							
21:42	MP19215-S2	No results reported for the elements associated with this internal standard.							
21:47	JD1293-1	No results reported for the elements associated with this internal standard.							
21:52	ZZZZZZ	98.059	98.417	94.811	90.564	99.741	95.293	91.779	100.081
21:57	ZZZZZZ	92.248	94.294	90.025	88.129	95.743	92.034	90.275	96.84
22:02	MA48091-CCVA9	No results reported for the elements associated with this internal standard.							
22:07	MA48091-CCB9	No results reported for the elements associated with this internal standard.							

! = Outside limits.

LEGEND:

Istd#	Parameter	Limits	CCV/CCB Limits
Istd#1	Lithium	60-125 %	60-125 %
Istd#2	Scandium (45-1)	60-125 %	60-125 %
Istd#3	Scandium (45-2)	60-125 %	60-125 %
Istd#4	Scandium (45-3)	60-125 %	60-125 %
Istd#5	Germanium (72-1)	60-125 %	60-125 %
Istd#6	Germanium (72-2)	60-125 %	60-125 %
Istd#7	Germanium (72-3)	60-125 %	60-125 %
Istd#8	Germanium (74-1)	60-125 %	60-125 %

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4	Istd#5	Istd#6	Istd#7	Istd#8

(a) No samples reported for the elements associated with this internal standard.

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Istd#9	Istd#10	Istd#11	Istd#12	Istd#13	Istd#14	Istd#15	Istd#16
14:28	MA48091-STD1	No results reported for the elements associated with this internal standard.							
14:32	MA48091-STD2	No results reported for the elements associated with this internal standard.							
14:37	MA48091-STD3	100	100	100	100	100	100	100	100
14:43	MA48091-STD4	100.177	100.395	98.964	101.208	100.138	100.228	99.884	100.136
14:47	MA48091-STD5	100.259	100.11	99.903	100.246	98.882	100.106	99.544	99.919
14:52	MA48091-STD6	100.499	100.458	97.685	100.344	98.459	98.005	99.376	98.343
14:57	MA48091-STD7	99.673	99.901	97.583	98.68	96.952	97.765	99.338	98.07
15:02	MA48091-STD8	101.534	100.846	98.238	99.853	97.114	97.804	101.311	97.96
15:07	MA48091-STD9	100.153	101.417	96.87	98.509	98.146	98.022	100.167	98.029
15:12	MA48091-STD10	98.831	100.664	96.82	97.851	97.085	98.523	99.085	97.714
15:17	MA48091-STD11	100.176	99.186	95.363	96.058	94.846	97.593	99.536	98.398
15:22	MA48091-STD12	92.85	98.511	95.131	89.43	93.34	95.434	91.235	97.676
15:27	ZZZZZZ	99.606	98.605	97.77	98.86	96.226	99.007	98.686	97.066
15:32	ZZZZZZ	102.355	100.524	96.64	96.772	93.919	97.436	101.119	97.896
15:36	MA48091-ICV1	100.145	98.863	98.687	99.813	97.616	97.765	99.6	96.107
15:43	MA48091-ICVA1	102.914	100.874	97.072	96.961	95.025	97.127	101.068	96.93
15:49	MA48091-ICB1	100.479	99.62	99.276	100.571	96.644	98.733	100.49	99.372
15:54	MA48091-CCVA1	103.167	100.451	98.527	98.424	94.908	98.613	101.833	98.988
15:59	MA48091-CCB1	101.078	99.268	99.733	100.847	97.457	99.241	100.333	98.439
16:04	MA48091-CRI1	100.134	99.117	98.861	98.414	97.218	98.909	99.427	97.668
16:13	MA48091-ICSA1	94.051	89.69	85.894	84.639	79.668	85.416	86.605	92.607
16:17	MA48091-ICSAB1	91.104	87.9	81.886	81.758	78.551	82.941	85.148	89.825
16:22	ZZZZZZ	90.311	91.939	90.72	92.447	91.617	91.427	91.894	92.831
16:28	MA48091-CCVA2	92.845	94.043	88.944	90.418	90.171	90.805	93.78	93.053
16:33	MA48091-CCB2	92.765	94.052	92.316	92.989	93.088	92.791	92.829	93.271
16:38	MP19163-MB1	88.243	92.162	86.895	88.899	92.766	88.263	87.111	90.691
16:42	MP19163-B2	89.486	93.501	86.286	88.585	91.662	87.813	88.935	91.8
16:47	MP19163-S3	91.646	96.556	85.18	89.188	93.204	88.31	90.603	92.256
16:52	MP19163-S4	93.898	98.341	86.041	90.721	93.934	88.847	90.87	92.67
16:57	JD1056-1F	93.721	100.016	87.649	92.432	96.352	91.082	91.131	94.27
17:02	MP19163-SD1	97.538	100.341	95.446	98.951	98.804	98.041	97.018	98.885
17:07	MP19163-PS1	94.083	98.507	88.885	92.938	95.024	91.139	91.955	95.086
17:12	ZZZZZZ	92.533	92.849	85.601	87.784	87.394	90.014	90.861	95.006

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Istd#9	Istd#10	Istd#11	Istd#12	Istd#13	Istd#14	Istd#15	Istd#16
17:17	MA48091-CCVA3	95.296	97.835	90.082	92.638	93.172	93.037	93.313	95.499
17:22	MA48091-CCB3	94.145	97.713	93.57	96.161	95.77	94.406	93.484	95.72
17:27	ZZZZZZ	93.669	95.253	89.359	90.321	89.811	92.791	91.879	95.541
17:32	ZZZZZZ	95.1	98.704	90.194	93.362	93.85	94.553	93.419	96.566
17:36	ZZZZZZ	94.257	96.749	88.952	92.344	91.868	92.411	92.236	96.328
17:41	ZZZZZZ	91.806	92.812	84.238	86.186	86.036	88.553	90.235	92.852
17:46	ZZZZZZ	91.606	95.829	87.325	89.814	91.354	91.617	90.841	94.667
17:51	ZZZZZZ	88.251	90.075	79.061	78.597	82.012	84.353	85.751	90.213
17:56	ZZZZZZ	94.647	98.795	91.911	92.356	94.519	94.27	94.258	96.371
18:01	ZZZZZZ	89.04	89.855	79.227	79.926	82.059	84.058	86.405	89.596
18:06	MA48091-CCVA4	94.515	97.829	90.578	91.806	94.777	94.249	95.525	96.521
18:11	MA48091-CCB4	93.121	97.059	94.103	94.116	96.538	97.177	93.513	97.355
18:16	ZZZZZZ	92.769	96.029	91.445	91.288	91.949	94.395	92.787	96.647
18:20	ZZZZZZ	86.568	89.385	81.577	79.747	84.282	85.832	84.501	91.509
18:25	ZZZZZZ	93.001	96.127	91.43	90.085	92.967	94.427	92.832	96.201
18:30	ZZZZZZ	96.331	98.561	96.611	95.101	96.358	98.162	96.917	97.327
18:35	ZZZZZZ	87.802	90.834	82.394	81.481	85.995	87.245	85.406	92.584
18:40	ZZZZZZ	93.606	96.555	93.086	92.677	94.959	96.146	94.48	97.704
18:45	ZZZZZZ	94.09	96.281	96.366	94.537	96.186	97.772	94.568	97.959
18:50	ZZZZZZ	90.071	95.287	91.079	89.848	95.115	93.068	89.524	95.615
18:55	MA48091-CCVA5	93.493	96.534	92.931	91.519	93.704	95.201	94.988	98.182
19:00	MA48091-CCB5	92.27	95.053	95.769	94.271	95.524	97.696	93.282	99.071
19:05	ZZZZZZ	92.721	95.615	96.286	93.652	95.463	98.195	93.181	98.432
19:10	ZZZZZZ	88.116	91.176	83.724	82.34	84.953	88.415	86.09	93.371
19:14	ZZZZZZ	94.578	98.279	93.954	91.995	94.541	96.447	95.207	98.491
19:19	ZZZZZZ	97.269	99.116	99.171	96.052	98.144	101.511	97.517	101.075
19:24	ZZZZZZ	89.145	92.354	85.512	83.023	87.427	90.121	86.631	95.001
19:29	ZZZZZZ	94.949	96.479	95.934	93.478	94.246	98.45	95.029	101.08
19:34	ZZZZZZ	95.15	96.714	97.088	94.085	95.595	100.098	95.425	100.186
19:39	MA48091-CCVA6	93.828	95.787	93.749	91.018	92.188	96.922	94.251	99.035
19:44	MA48091-CCB6	94.054	95.697	96.428	94.546	96.441	98.416	94.633	98.75
19:49	ZZZZZZ	94.341	96.96	98.433	95.489	95.876	99.817	94.186	99.67
19:54	ZZZZZZ	93.15	95.125	97.751	94.425	95.311	98.769	93.653	99.143

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Istd#9	Istd#10	Istd#11	Istd#12	Istd#13	Istd#14	Istd#15	Istd#16
19:59	ZZZZZZ	92.277	94.788	96.831	93.51	94.459	98.608	93.076	99.112
20:04	ZZZZZZ	92.111	94.764	97.369	92.916	95.515	98.855	93.098	99.783
20:09	ZZZZZZ	91.739	93.854	96.804	93.636	93.504	97.912	92.567	99.552
20:13	ZZZZZZ	92.423	94.324	96.627	93.618	94.557	98.594	93.236	99.592
20:18	ZZZZZZ	92.281	94.728	96.71	94.162	93.974	98.662	93.056	99.22
20:23	ZZZZZZ	92.789	94.914	96.643	93.657	95.302	98.011	93.535	99.51
20:28	ZZZZZZ	90.962	94.347	96.267	93.342	95.079	97.533	92.322	99.223
20:33	ZZZZZZ	92.117	94.577	96.398	94.214	94.86	97.074	92.656	98.522
20:38	MA48091-CCVA7	No results reported for the elements associated with this internal standard.							
20:43	MA48091-CCB7	No results reported for the elements associated with this internal standard.							
20:48	ZZZZZZ	90.859	91.008	94.749	90.804	91.996	97.588	91.285	97.729
20:53	ZZZZZZ	88.044	92.919	89.339	87.407	92.279	92.112	88.188	96.386
20:58	ZZZZZZ	92.438	93.523	97.154	92.304	92.447	99.367	93.144	100.093
21:03	ZZZZZZ	90.746	93.01	95.667	92.771	93.483	97.185	91.281	99.076
21:08	ZZZZZZ	91.211	93.797	92.18	91.09	92.296	95.733	91.529	98.291
21:13	ZZZZZZ	93.369	93.286	97.342	92.688	92.823	99.062	93.509	99.866
21:17	MA48091-CCVA8	No results reported for the elements associated with this internal standard.							
21:22	MA48091-CCB8	No results reported for the elements associated with this internal standard.							
21:27	MP19215-MB1	No results reported for the elements associated with this internal standard.							
21:32	MP19215-B1	No results reported for the elements associated with this internal standard.							
21:37	MP19215-S1	No results reported for the elements associated with this internal standard.							
21:42	MP19215-S2	No results reported for the elements associated with this internal standard.							
21:47	JD1293-1	No results reported for the elements associated with this internal standard.							
21:52	ZZZZZZ	95.713	91.574	100.704	94.887	91.763	102.403	96.272	101.628
21:57	ZZZZZZ	91.882	89.77	98.77	92.095	91.806	100.421	93.486	99.94
22:02	MA48091-CCVA9	No results reported for the elements associated with this internal standard.							
22:07	MA48091-CCB9	No results reported for the elements associated with this internal standard.							

! = Outside limits.

LEGEND:

Istd#	Parameter	Limits	CCV/CCB Limits
Istd#9	Germanium (74-2)	60-125 %	60-125 %
Istd#10	Germanium (74-3)	60-125 %	60-125 %
Istd#11	Rhodium (103-1)	60-125 %	60-125 %
Istd#12	Rhodium (103-2)	60-125 %	60-125 %
Istd#13	Rhodium (103-3)	60-125 %	60-125 %
Istd#14	Indium (115-1)	60-125 %	60-125 %
Istd#15	Indium (115-2)	60-125 %	60-125 %
Istd#16	Terbium (159-1)	60-125 %	60-125 %

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Istd#17	Istd#18	Istd#19	Istd#20	Istd#21	Istd#22
14:28	MA48091-STD1	No results reported for the elements associated with this internal standard.					
14:32	MA48091-STD2	No results reported for the elements associated with this internal standard.					
14:37	MA48091-STD3	100	100	100	100	100	100
14:43	MA48091-STD4	100.887	98.825	99.648	99.89	99.528	99.689
14:47	MA48091-STD5	99.857	98.728	98.832	100.039	99.009	99.067
14:52	MA48091-STD6	99.523	98.901	98.263	98.878	97.96	98.054
14:57	MA48091-STD7	98.481	97.832	98.099	97.88	97.088	97.327
15:02	MA48091-STD8	99.64	98.293	97.171	99.25	98.592	98.656
15:07	MA48091-STD9	98.596	99.349	97.776	98.397	98	97.835
15:12	MA48091-STD10	98.608	97.985	97.832	97.511	96.944	96.932
15:17	MA48091-STD11	98.782	97.64	97.64	97.934	94.89	95.263
15:22	MA48091-STD12	92.273	96.469	97.211	90.984	92.09	86.705
15:27	ZZZZZZ	97.631	95.847	96.961	97.878	97.04	97.011
15:32	ZZZZZZ	99.22	96.307	97.16	98.437	95.544	94.862
15:36	MA48091-ICV1	99.034	97.72	96.787	98.429	95.946	98.109
15:43	MA48091-ICVA1	98.294	96.885	97.236	98.783	93.54	94.661
15:49	MA48091-ICB1	100.674	96.845	98.026	99.862	97.048	98.26
15:54	MA48091-CCVA1	99.705	97.273	98.917	98.864	94.2	95.666
15:59	MA48091-CCB1	99.378	95.965	97.222	99.183	97.182	98.432
16:04	MA48091-CRI1	99.995	96.887	97.087	98.773	95.354	97.429
16:13	MA48091-ICSA1	92.626	87.615	92.186	93.038	81.79	77.928
16:17	MA48091-ICSAB1	90.662	86.507	89.866	90.045	79.868	75.244
16:22	ZZZZZZ	93.257	93.355	92.168	93.751	92.576	92.934
16:28	MA48091-CCVA2	94.848	94.332	93.469	94.829	90.928	91.636
16:33	MA48091-CCB2	94.166	94.066	93.238	94.214	93.053	94.399
16:38	MP19163-MB1	91.53	95.304	90.594	91.513	90.494	90.666
16:42	MP19163-B2	91.249	95.404	91.566	92.42	89.523	89.661
16:47	MP19163-S3	92.221	97.799	91.684	92.755	89.988	89.347
16:52	MP19163-S4	94.45	97.653	92.852	94.44	90.253	90.742
16:57	JD1056-1F	93.521	98.903	94.077	94.821	92.521	92.146
17:02	MP19163-SD1	98.065	99.125	98.746	98.354	98.83	97.684
17:07	MP19163-PS1	94.911	98.581	95.258	95.192	92.927	90.956
17:12	ZZZZZZ	93.438	93.92	94.683	93.437	86.713	86.078

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Istd#17	Istd#18	Istd#19	Istd#20	Istd#21	Istd#22
17:17	MA48091-CCVA3	95.174	97.468	95.241	95.393	93.025	92.346
17:22	MA48091-CCB3	96.095	96.416	96.45	96.486	95.646	95.534
17:27	ZZZZZZ	94.784	95.071	95.865	95.628	90.609	89.744
17:32	ZZZZZZ	96.876	97.824	97.21	96.564	94.102	92.826
17:36	ZZZZZZ	96.548	95.266	95.13	96.592	91.409	91.988
17:41	ZZZZZZ	92.2	91.979	93.144	93.302	85.897	82.065
17:46	ZZZZZZ	93.854	96.156	95.394	94.405	91.177	90.066
17:51	ZZZZZZ	88.442	91.116	90.386	89.069	80.234	74.311
17:56	ZZZZZZ	95.027	97.99	95.414	95.358	94.168	93.184
18:01	ZZZZZZ	87.848	90.959	89.852	88.631	79.717	74.049
18:06	MA48091-CCVA4	95.405	98.838	97.017	95.892	92.844	92.726
18:11	MA48091-CCB4	95.616	97.588	97.075	96.165	96.417	95.156
18:16	ZZZZZZ	94.54	96.669	95.752	94.865	93.254	92.412
18:20	ZZZZZZ	88.197	93.654	90.821	89.272	82.122	75.81
18:25	ZZZZZZ	94.541	97.694	96.73	94.707	92.62	91.407
18:30	ZZZZZZ	96.484	98.366	97.163	96.193	96.676	96.215
18:35	ZZZZZZ	89.219	95.144	92.819	89.912	84.183	76.411
18:40	ZZZZZZ	94.051	97.679	97.035	94.688	94.117	93.298
18:45	ZZZZZZ	95.357	97.783	97.708	95.888	96.243	95.528
18:50	ZZZZZZ	93.22	98.888	95.54	93.566	93.876	91.425
18:55	MA48091-CCVA5	95.252	97.522	98.003	96.156	95.299	93.08
19:00	MA48091-CCB5	94.989	97.091	98.788	95.347	97.367	95.766
19:05	ZZZZZZ	95.409	97.376	97.986	96.048	97.599	95.395
19:10	ZZZZZZ	90.013	93.157	94.017	91.051	84.831	76.761
19:14	ZZZZZZ	95.551	99.581	98.117	94.82	95.451	91.624
19:19	ZZZZZZ	97.913	99.672	99.962	96.443	99.439	96.485
19:24	ZZZZZZ	90.907	94.529	95.607	91.658	86.015	81.347
19:29	ZZZZZZ	95.909	96.595	100.153	95.377	97.633	94.005
19:34	ZZZZZZ	95.238	96.677	99.409	95.608	99.473	95.363
19:39	MA48091-CCVA6	94.966	96.204	98.54	94.63	95.357	92.451
19:44	MA48091-CCB6	95.578	96.441	99.449	95.302	99.206	95.606
19:49	ZZZZZZ	96.081	96.975	99.227	96.621	99.516	95.891
19:54	ZZZZZZ	95.491	96.939	98.525	95.957	98.816	95.618

INTERNAL STANDARD SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
Analyst: GT Run ID: MA48091
Parameters: As

Time	Sample Description	Istd#17	Istd#18	Istd#19	Istd#20	Istd#21	Istd#22
19:59	ZZZZZZ	95.341	95.749	98.696	95.165	98.573	93.819
20:04	ZZZZZZ	94.787	95.669	98.73	95.717	99.551	95.07
20:09	ZZZZZZ	94.327	95.646	99.213	94.482	99.434	94.563
20:13	ZZZZZZ	94.688	96.648	99.78	95.079	99.405	95.235
20:18	ZZZZZZ	94.763	95.351	98.955	95.406	99.435	95.244
20:23	ZZZZZZ	95.9	96.504	99.225	95.888	99.071	95.553
20:28	ZZZZZZ	94.588	96.957	99.128	94.754	98.855	95.003
20:33	ZZZZZZ	94.383	95.544	98.542	93.857	98.515	94.144
20:38	MA48091-CCVA7	No results reported for the elements associated with this internal standard.					
20:43	MA48091-CCB7	No results reported for the elements associated with this internal standard.					
20:48	ZZZZZZ	92.496	93.133	97.559	92.786	97.989	93.656
20:53	ZZZZZZ	90.649	96.012	96.926	90.944	93.843	88.896
20:58	ZZZZZZ	94.44	94.971	99.196	94.354	99.042	94.513
21:03	ZZZZZZ	93.021	94.903	98.542	94.353	99.319	94.073
21:08	ZZZZZZ	94.374	96.167	98.45	93.335	96.437	92.162
21:13	ZZZZZZ	94.96	93.184	99.058	95.133	99.241	94.922
21:17	MA48091-CCVA8	No results reported for the elements associated with this internal standard.					
21:22	MA48091-CCB8	No results reported for the elements associated with this internal standard.					
21:27	MP19215-MB1	No results reported for the elements associated with this internal standard.					
21:32	MP19215-B1	No results reported for the elements associated with this internal standard.					
21:37	MP19215-S1	No results reported for the elements associated with this internal standard.					
21:42	MP19215-S2	No results reported for the elements associated with this internal standard.					
21:47	JD1293-1	No results reported for the elements associated with this internal standard.					
21:52	ZZZZZZ	96.358	93.026	101.518	96.522	101.32	95.571
21:57	ZZZZZZ	94.472	93.918	99.489	94.567	99.961	95.224
22:02	MA48091-CCVA9	No results reported for the elements associated with this internal standard.					
22:07	MA48091-CCB9	No results reported for the elements associated with this internal standard.					

! = Outside limits.

LEGEND:

Istd#	Parameter	Limits	CCV/CCB Limits
Istd#17	Terbium (159-2)	60-125 %	60-125 %
Istd#18	Terbium (159-3)	60-125 %	60-125 %
Istd#19	Holmium (165-1)	60-125 %	60-125 %
Istd#20	Holmium (165-2)	60-125 %	60-125 %
Istd#21	Bismuth (209-1)	60-125 %	60-125 %
Istd#22	Bismuth (209-2)	60-125 %	60-125 %

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
QC Limits: result < 1/2 RL Run ID: MA48091 Units: ug/l

Time:				15:49		15:59		16:33	
Sample ID:				ICB1		CCB1		CCB2	
Metal	RL	IDL	LOD	raw	final	raw	final	raw	final
Aluminum	25	.28	20						
Antimony	2.0	.094	1.5						
Arsenic	1.5	.013	1.0	0.0144	<1.5	0.0151	<1.5	0.0171	<1.5
Barium	1.0	.008	0.50						
Beryllium	0.50	.004	0.25						
Boron	25	.65	20						
Cadmium	3.0	.004	2.0						
Calcium	250	6.1	50						
Chromium	4.0	.014	3.0						
Cobalt	0.50	.002	0.25						
Copper	5.0	.021	4.0						
Iron	25	.43	13						
Lead	1.5	.009	1.0						
Magnesium	250	.15	130						
Manganese	2.0	.007	1.0						
Molybdenum	1.0	.015	0.50						
Nickel	4.0	.017	3.0						
Potassium	250	.71	50						
Selenium	1.0	.072	0.50						
Silver	1.0	.004	0.50						
Sodium	250	1	100						
Strontium	10	.003	5.0						
Thallium	1.0	.004	0.50						
Tin	5.0	.071	2.5						
Titanium	2.0	.035	1.0						
Vanadium	1.5	.009	1.0						
Zinc	10	.029	7.5						

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
QC Limits: result < 1/2 RL Run ID: MA48091 Units: ug/l

Time:				17:22	
Sample ID:				CCB3	
Metal	RL	IDL	LOD	raw	final
Aluminum	25	.28	20		
Antimony	2.0	.094	1.5		
Arsenic	1.5	.013	1.0	0.0136	<1.5
Barium	1.0	.008	0.50		
Beryllium	0.50	.004	0.25		
Boron	25	.65	20		
Cadmium	3.0	.004	2.0		
Calcium	250	6.1	50		
Chromium	4.0	.014	3.0		
Cobalt	0.50	.002	0.25		
Copper	5.0	.021	4.0		
Iron	25	.43	13		
Lead	1.5	.009	1.0		
Magnesium	250	.15	130		
Manganese	2.0	.007	1.0		
Molybdenum	1.0	.015	0.50		
Nickel	4.0	.017	3.0		
Potassium	250	.71	50		
Selenium	1.0	.072	0.50		
Silver	1.0	.004	0.50		
Sodium	250	1	100		
Strontium	10	.003	5.0		
Thallium	1.0	.004	0.50		
Tin	5.0	.071	2.5		
Titanium	2.0	.035	1.0		
Vanadium	1.5	.009	1.0		
Zinc	10	.029	7.5		

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
QC Limits: 90 to 110 % Recovery Run ID: MA48091 Units: ug/l

Time:		15:36			15:43			15:54	
Sample ID:	ICV	ICV1		ICVA	ICVA1		CCVA	CCVA1	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony									
Arsenic				60	62.6	104.3	50	49.2	98.4
Barium									
Beryllium									
Boron									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Molybdenum									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Strontium									
Thallium									
Tin									
Titanium									
Vanadium									
Zinc									

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
QC Limits: 90 to 110 % Recovery Run ID: MA48091 Units: ug/l

Time:		16:28			17:17	
Sample ID:	CCVA	CCVA2		CCVA	CCVA3	
Metal	True	Results	% Rec	True	Results	% Rec
Aluminum	anr					
Antimony	anr					
Arsenic	50	50.7	101.4	50	50.2	100.4
Barium	anr					
Beryllium	anr					
Boron						
Cadmium	anr					
Calcium	anr					
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	anr					
Lead	anr					
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Potassium	anr					
Selenium	anr					
Silver	anr					
Sodium	anr					
Strontium						
Thallium	anr					
Tin						
Titanium						
Vanadium	anr					
Zinc	anr					

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
QC Limits: 80 to 120 % Recovery Run ID: MA48091 Units: ug/l

Time:			16:04	
Sample ID:	CRI	CRIA	CRI1	
Metal	True	True	Results	% Rec
Aluminum	25	25	anr	
Antimony	2.0	0.25	anr	
Arsenic	0.50	0.50	0.507	101.4
Barium	1.0	0.50	anr	
Beryllium	0.50	0.25	anr	
Boron	25	2.5		
Cadmium	0.50	0.25	anr	
Calcium	250	125	anr	
Chromium	1.0	2.0	anr	
Cobalt	0.50	0.25	anr	
Copper	2.0	2.0	anr	
Iron	25	25	anr	
Lead	0.50	0.25	anr	
Magnesium	250	125	anr	
Manganese	1.0	0.25	anr	
Molybdenum	1.0	0.50		
Nickel	1.0	2.0	anr	
Potassium	250	125	anr	
Selenium	0.50	0.50	anr	
Silver	0.50	1.0	anr	
Sodium	250	125	anr	
Strontium	5.0	0.50		
Thallium	0.50	0.25	anr	
Tin	5.0	0.50		
Titanium	1.0	0.50		
Vanadium	1.0	2.0	anr	
Zinc	5.0	2.0	anr	

(*) Outside of QC limits
(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

File ID: XA011020M2L.CSV Date Analyzed: 01/10/20 Methods: EPA 200.8, SW846 6020B
QC Limits: 80 to 120 % Recovery Run ID: MA48091 Units: ug/l

Time:			16:13		16:17	
Sample ID:	ICSA	ICSAB	ICSA1		ICSAB1	
Metal	True	True	Results	% Rec	Results	% Rec
Aluminum	100000	100000	96900	96.9	97600	97.6
Antimony			0.557		0.524	
Arsenic		20	0.0553		19.5	97.5
Barium			0.210		0.257	
Beryllium			0.00291		-0.00101	
Boron		50	1.52		53.3	106.6
Cadmium		20	-0.192		19.0	95.0
Calcium	100000	100000	95800	95.8	98100	98.1
Chromium		20	0.762		19.5	97.5
Cobalt		20	0.174		18.5	92.5
Copper		20	-0.0902		17.1	85.5
Iron	100000	100000	90500	90.5	93300	93.3
Lead			0.0910		0.134	
Magnesium	100000	100000	95700	95.7	97100	97.1
Manganese		20	0.375		19.7	98.5
Molybdenum	2000	2000	2160	108.0	2250	112.5
Nickel		20	0.788		18.1	90.5
Potassium	100000	100000	99600	99.6	101000	101.0
Selenium		20	0.122		21.8	109.0
Silver		20	0.0313		20.6	103.0
Sodium	100000	100000	96200	96.2	97300	97.3
Strontium	2000	2000	2060	103.0	1910	95.5
Thallium			0.00792		0.00721	
Tin	2000	2000	2090	104.5	2020	101.0
Titanium	2000	2000	1850	92.5	1910	95.5
Vanadium		20	0.0242		19.7	98.5
Zinc		20	0.419		16.9	84.5

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

QC Batch ID: MP19163
Matrix Type: AQUEOUS

Methods: SW846 6020B
Units: ug/l

Prep Date: 01/08/20

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	.55	32		
Antimony	4.0	.19	1.7		
Arsenic	3.0	.026	.94	0.26	<3.0
Barium	2.0	.016	.73		
Beryllium	1.0	.008	.15		
Boron	50	1.3	14		
Cadmium	6.0	.008	.17		
Calcium	500	12	64		
Chromium	8.0	.028	.62		
Cobalt	1.0	.004	.17		
Copper	10	.042	1.9		
Iron	50	.86	19		
Lead	3.0	.018	.52		
Magnesium	500	.3	46		
Manganese	4.0	.014	.63		
Molybdenum	2.0	.03	.45		
Nickel	8.0	.034	.95		
Potassium	500	1.4	68		
Selenium	2.0	.14	.55		
Silver	2.0	.008	.16		
Sodium	500	2.1	140		
Strontium	20	.006	2.4		
Thallium	2.0	.008	.17		
Tin	10	.14	2.6		
Titanium	4.0	.07	1.6		
Vanadium	3.0	.018	1.8		
Zinc	20	.058	5.4		

Associated samples MP19163: JD1172-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

QC Batch ID: MP19163 Methods: SW846 6020B
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 01/08/20

Metal	JD1056-1F Original MS		Spikelot MP6020AQ3%		Rec	QC Limits
Aluminum	anr					
Antimony	anr					
Arsenic	6.6	373	400		91.6	75-125
Barium	anr					
Beryllium	anr					
Boron						
Cadmium	anr					
Calcium	anr					
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	anr					
Lead	anr					
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Potassium	anr					
Selenium	anr					
Silver	anr					
Sodium	anr					
Strontium						
Thallium	anr					
Tin						
Titanium						
Vanadium	anr					
Zinc	anr					

Associated samples MP19163: JD1172-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

QC Batch ID: MP19163 Methods: SW846 6020B
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 01/08/20

Metal	JD1056-1F Original	MSD	Spikelot MP6020AQ3%	Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	6.6	367	400	90.1	1.6	20
Barium	anr					
Beryllium	anr					
Boron						
Cadmium	anr					
Calcium	anr					
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	anr					
Lead	anr					
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Potassium	anr					
Selenium	anr					
Silver	anr					
Sodium	anr					
Strontium						
Thallium	anr					
Tin						
Titanium						
Vanadium	anr					
Zinc	anr					

Associated samples MP19163: JD1172-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

QC Batch ID: MP19163
Matrix Type: AQUEOUS

Methods: SW846 6020B
Units: ug/l

Prep Date: 01/08/20

Metal	BSP Result	Spikelot MP6020AQ3%	Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	73.2	80	91.5	80-120
Barium	anr			
Beryllium	anr			
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	anr			
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Potassium	anr			
Selenium	anr			
Silver	anr			
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Titanium				
Vanadium	anr			
Zinc	anr			

Associated samples MP19163: JD1172-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

QC Batch ID: MP19163
Matrix Type: AQUEOUS

Methods: SW846 6020B
Units: ug/l

Prep Date: 01/08/20

Metal	JD1056-1F Original	SDL 2:10	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	1.31	1.10	15.9*(a)	0-10
Barium	anr			
Beryllium	anr			
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	anr			
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Potassium	anr			
Selenium	anr			
Silver	anr			
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Titanium				
Vanadium	anr			
Zinc	anr			

Associated samples MP19163: JD1172-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested
(a) Serial dilution indicates possible matrix interference.

POST DIGESTATE SPIKE SUMMARY

Login Number: JD1172
Account: SCMAW - Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

QC Batch ID: MP19163
Matrix Type: AQUEOUS

Methods: SW846 6020B
Units: ug/l

Prep Date: 01/08/20

Metal	Sample ml	Final ml	JD1056-1F Raw	Corr.**	PS ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
Aluminum										
Antimony										
Arsenic	9.14	10	1.312887	1.199979	77.02592	0.2	4	80	94.8	75-125
Barium										
Beryllium										
Boron										
Cadmium										
Calcium										
Chromium										
Cobalt										
Copper										
Iron										
Lead										
Magnesium										
Manganese										
Molybdenum										
Nickel										
Potassium										
Selenium										
Silver										
Sodium										
Strontium										
Thallium										
Tin										
Titanium										
Vanadium										
Zinc										

Associated samples MP19163: JD1172-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(**) Corr. sample result = Raw * (sample volume / final volume)
(anr) Analyte not requested

Instrument Detection Limits

Job Number: JD1172
Account: SCMAW Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

Instrument ID: AGICPMS1 **Effective Date:** 01/31/19

Analyte	IDL ug/l
Aluminum	.045
Aluminum	.276
Antimony	.094
Arsenic	.12
Arsenic	.013
Barium	.008
Beryllium	.004
Boron	.648
Cadmium	.007
Cadmium	.004
Calcium	6.11
Chromium	.036
Chromium	.014
Cobalt	.0041
Cobalt	.002
Copper	.1044
Copper	.021
Iron	1.21
Iron	.432
Lead	.009
Magnesium	.033
Magnesium	.152
Manganese	.006
Manganese	.007
Molybdenum	.015
Nickel	.046
Nickel	.017
Potassium	.506
Potassium	.707
Selenium	.503
Selenium	.072
Silver	.004
Sodium	.357
Sodium	1.037
Strontium	.003
Thallium	.004
Tin	.025
Tin	.071
Titanium	.035
Titanium	.035
Vanadium	.112
Vanadium	.009
Zinc	.041
Zinc	.029

Instrument Detection Limits

Job Number: JD1172
Account: SCMAW Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

Instrument ID: AGICPMS1 **Effective Date:** 01/31/19

Analyte	IDL ug/l

The above applies to the following instrument runs:
MA48089,MA48091

Instrument Linear Ranges

Job Number: JD1172
Account: SCMAW Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

Instrument ID: AGICPMS1 **Effective Date:** 09/10/18

Analyte	Linear Range ug/l
Aluminum	10000
Aluminum	10000
Antimony	100
Arsenic	100
Arsenic	100
Barium	100
Beryllium	100
Boron	200
Cadmium	100
Cadmium	100
Calcium	10000
Chromium	100
Chromium	100
Cobalt	100
Cobalt	100
Copper	100
Copper	100
Iron	10000
Iron	10000
Lithium	100
Lead	100
Magnesium	10000
Magnesium	10000
Manganese	100
Manganese	100
Molybdenum	100
Nickel	100
Nickel	100
Potassium	10000
Potassium	10000
Selenium	400
Selenium	400
Silver	100
Sodium	10000
Sodium	10000
Strontium	100
Thallium	100
Tin	100
Tin	100
Titanium	100
Titanium	100
Tungsten	100
Uranium	100
Vanadium	100
Vanadium	100
Zinc	100

Instrument Linear Ranges

Job Number: JD1172
Account: SCMAW Sovereign Consulting
Project: Shepley's Hill (SHL), Devens, MA

Instrument ID: AGICPMS1 **Effective Date:** 09/10/18

Analyte	Linear Range ug/l
Zinc	100

The above applies to the following instrument runs:
MA48089,MA48091

Metals Analysis

Raw Data

Quantitation Report

File Name	001CALB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 9:37
Sample Name	STDA 5
Sample Type	CalBlk
Comment	0
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.001	ug/l	319.64	37.33	1.145E-05	Pulse	0.25	3
B			1	0.059	ug/l	36.87	2,475.81	7.600E-04	Pulse	0.15	3
Ca			1	0.908	ug/l	41.96	8,522.45	1.320E-03	Pulse	0.10	3
Sr			1	0.002	ug/l	144.67	573.37	5.848E-05	Pulse	0.10	3
Mo			1	0.002	ug/l	324.82	73.34	7.457E-06	Pulse	0.10	3
Ag			1	0.001	ug/l	70.67	46.67	4.623E-06	Pulse	0.10	3
Sn			1	0.032	ug/l	15.26	1,596.81	1.591E-04	Pulse	0.10	3
Sb			1	0.305	ug/l	2.62	1,430.12	9.477E-05	Pulse	0.10	3
Ba			1	0.005	ug/l	17.94	53.33	3.536E-06	Pulse	0.10	3
Tl			1	0.002	ug/l	9.86	100.00	1.021E-05	Pulse	0.10	3
Pb			1	0.008	ug/l	56.07	363.36	3.713E-05	Pulse	0.10	3
Pb			1	0.003	ug/l	40.94	366.69	3.745E-05	Pulse	0.10	3
Pb			1	0.002	ug/l	85.00	1,423.42	1.454E-04	Pulse	0.10	3
Na			2	0.239	ug/l	40.69	11,888.72	2.935E-02	Pulse	0.30	3
Mg			2	0.062	ug/l	54.96	100.00	2.469E-04	Pulse	0.30	3
Al			2	0.247	ug/l	65.47	116.67	2.880E-04	Pulse	0.30	3
K			2	-0.628	ug/l	-56.19	11,985.54	2.959E-02	Pulse	0.30	3
Ca			2	-0.757	ug/l	-73.11	85.56	2.112E-04	Pulse	0.30	3
Ti			2	-0.072	ug/l	-13.00	8.89	2.195E-05	Pulse	0.30	3
V			2	0.002	ug/l	167.72	184.45	4.553E-04	Pulse	0.30	3
Cr			2	0.006	ug/l	76.13	445.57	1.100E-03	Pulse	0.30	3
Mn			2	0.123	ug/l	1.70	100.00	2.469E-04	Pulse	0.30	3
Fe			2	0.140	ug/l	24.17	3,750.50	9.260E-03	Pulse	0.30	3
Co			2	0.000	ug/l	279.79	52.21	1.289E-04	Pulse	0.30	3
Ni			2	0.001	ug/l	91.01	43.33	1.070E-04	Pulse	0.30	3
Cu			2	0.297	ug/l	11.29	20,100.23	4.962E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	0.332	ug/l	14.97	971.15	2.397E-03	Pulse	0.30	3
As			2	-0.004	ug/l	-263.95	28.00	6.912E-05	Pulse	1.00	3
Cd			2	0.002	ug/l	167.88	24.44	9.880E-06	Pulse	0.30	3
Sn			2	0.221	ug/l	7.73	613.36	2.482E-04	Pulse	0.30	3
Se			3	-0.016	ug/l	-46.92	17.00	2.624E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,257,163.25	0.77	100.0	Pulse	0.10	3
1	Sc		6,454,909.07	0.17	100.0	Analog	0.10	3
1	Ge		1,263,495.06	1.09	100.0	Pulse	0.10	3
1	Ge		1,763,495.39	1.84	100.0	Pulse	0.10	3
1	Rh		9,811,640.69	0.67	100.0	Analog	0.10	3
1	In		10,043,590.30	1.56	100.0	Analog	0.10	3
1	Tb		15,086,118.11	0.48	100.0	Analog	0.10	3
1	Ho		15,352,745.19	0.99	100.0	Analog	0.10	3
1	Bi		9,789,838.39	0.35	100.0	Analog	0.10	3
2	Sc		405,075.54	0.25	100.0	Pulse	0.30	3
2	Ge		242,961.38	1.17	100.0	Pulse	0.30	3
2	Ge		366,364.33	0.50	100.0	Pulse	0.30	3
2	Rh		6,887,802.50	1.67	100.0	Analog	0.30	3
2	In		2,469,541.43	0.92	100.0	Pulse	0.30	3
2	Tb		9,399,939.35	0.66	100.0	Analog	0.30	3
2	Ho		9,568,986.84	0.38	100.0	Analog	0.30	3
2	Bi		6,591,871.54	0.51	100.0	Analog	0.30	3
3	Sc		714,298.90	0.46	100.0	Pulse	0.30	3
3	Ge		432,246.31	0.30	100.0	Pulse	0.30	3
3	Ge		647,727.60	0.23	100.0	Pulse	0.30	3
3	Rh		6,347,263.22	0.90	100.0	Analog	0.30	3
3	Tb		10,712,516.52	0.78	100.0	Analog	0.30	3

Quantitation Report

File Name	002CALB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 9:42
Sample Name	STDA
Sample Type	CalBlk
Comment	0
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	-0.001	ug/l	-77.37	26.67	8.331E-06	Pulse	0.25	3
B			1	0.067	ug/l	78.10	2,473.58	7.718E-04	Pulse	0.15	3
Ca			1	0.368	ug/l	43.38	8,072.28	1.249E-03	Pulse	0.10	3
Sr			1	0.001	ug/l	255.46	520.03	5.383E-05	Pulse	0.10	3
Mo			1	-0.003	ug/l	-39.56	30.00	3.101E-06	Pulse	0.10	3
Ag			1	0.000	ug/l	165.19	23.33	2.359E-06	Pulse	0.10	3
Sn			1	0.030	ug/l	12.95	1,533.47	1.560E-04	Pulse	0.10	3
Sb			1	0.306	ug/l	0.14	1,430.13	9.612E-05	Pulse	0.10	3
Ba			1	0.005	ug/l	74.25	53.33	3.579E-06	Pulse	0.10	3
Tl			1	0.002	ug/l	20.06	106.67	1.100E-05	Pulse	0.10	3
Pb			1	0.006	ug/l	98.70	326.69	3.376E-05	Pulse	0.10	3
Pb			1	-0.002	ug/l	-57.67	280.01	2.888E-05	Pulse	0.10	3
Pb			1	0.003	ug/l	80.39	1,440.09	1.485E-04	Pulse	0.10	3
Na			2	0.227	ug/l	75.10	11,731.95	2.931E-02	Pulse	0.30	3
Mg			2	0.059	ug/l	72.70	96.67	2.414E-04	Pulse	0.30	3
Al			2	0.277	ug/l	43.03	122.22	3.053E-04	Pulse	0.30	3
K			2	-0.286	ug/l	-207.79	12,014.44	3.001E-02	Pulse	0.30	3
Ca			2	-1.426	ug/l	-45.59	66.67	1.664E-04	Pulse	0.30	3
Ti			2	-0.055	ug/l	-111.38	12.22	3.048E-05	Pulse	0.30	3
V			2	0.006	ug/l	58.54	212.22	5.303E-04	Pulse	0.30	3
Cr			2	0.003	ug/l	208.36	411.12	1.027E-03	Pulse	0.30	3
Mn			2	0.120	ug/l	3.71	84.44	2.110E-04	Pulse	0.30	3
Fe			2	0.122	ug/l	10.62	3,582.65	8.950E-03	Pulse	0.30	3
Co			2	0.000	ug/l	-100.91	41.10	1.027E-04	Pulse	0.30	3
Ni			2	0.001	ug/l	415.44	44.44	1.109E-04	Pulse	0.30	3
Cu			2	0.214	ug/l	16.75	18,990.01	4.744E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	0.283	ug/l	10.80	880.04	2.199E-03	Pulse	0.30	3
As			2	0.001	ug/l	2165.04	31.33	7.825E-05	Pulse	1.00	3
Cd			2	0.002	ug/l	188.11	26.66	1.081E-05	Pulse	0.30	3
Sn			2	0.209	ug/l	8.75	552.24	2.247E-04	Pulse	0.30	3
Se			3	0.203	ug/l	136.80	73.35	1.154E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,203,887.20	0.87	100.0	Pulse	0.10	3
1	Sc		6,461,985.53	1.58	100.0	Analog	0.10	3
1	Ge		1,255,731.41	1.06	100.0	Pulse	0.10	3
1	Ge		1,749,777.06	0.68	100.0	Pulse	0.10	3
1	Rh		9,664,291.53	0.43	100.0	Analog	0.10	3
1	In		9,835,348.55	1.36	100.0	Analog	0.10	3
1	Tb		14,878,416.03	1.66	100.0	Analog	0.10	3
1	Ho		14,944,183.11	1.28	100.0	Analog	0.10	3
1	Bi		9,701,705.27	1.29	100.0	Analog	0.10	3
2	Sc		400,313.91	0.33	100.0	Pulse	0.30	3
2	Ge		242,331.02	0.19	100.0	Pulse	0.30	3
2	Ge		363,798.64	0.26	100.0	Pulse	0.30	3
2	Rh		6,812,354.45	0.44	100.0	Analog	0.30	3
2	In		2,459,651.29	0.95	100.0	Pulse	0.30	3
2	Tb		9,238,622.41	0.60	100.0	Analog	0.30	3
2	Ho		9,473,452.40	0.42	100.0	Analog	0.30	3
2	Bi		6,586,638.90	0.37	100.0	Analog	0.30	3
3	Sc		695,517.65	0.20	100.0	Pulse	0.30	3
3	Ge		425,132.79	0.76	100.0	Pulse	0.30	3
3	Ge		636,864.96	0.39	100.0	Pulse	0.30	3
3	Rh		6,371,094.61	0.45	100.0	Analog	0.30	3
3	Tb		10,796,279.29	0.43	100.0	Analog	0.30	3

Quantitation Report

File Name	003CALB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 9:49
Sample Name	STDA
Sample Type	CalBlk
Comment	0
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.000	ug/l	1670.12	33.33	1.040E-05	Pulse	0.25	3
B			1	0.015	ug/l	208.38	2,217.98	6.923E-04	Pulse	0.15	3
Ca			1	0.057	ug/l	753.12	7,748.75	1.209E-03	Pulse	0.10	3
Sr			1	0.000	ug/l	---	483.36	5.005E-05	Pulse	0.10	3
Mo			1	0.001	ug/l	510.77	60.00	6.230E-06	Pulse	0.10	3
Ag			1	0.000	ug/l	581.82	16.67	1.713E-06	Pulse	0.10	3
Sn			1	0.010	ug/l	144.44	1,240.10	1.265E-04	Pulse	0.10	3
Sb			1	0.289	ug/l	3.10	1,120.08	7.522E-05	Pulse	0.10	3
Ba			1	0.001	ug/l	152.15	23.33	1.566E-06	Pulse	0.10	3
Tl			1	0.002	ug/l	47.96	103.34	1.063E-05	Pulse	0.10	3
Pb			1	0.000	ug/l	---	226.68	2.331E-05	Pulse	0.10	3
Pb			1	0.000	ug/l	---	316.68	3.257E-05	Pulse	0.10	3
Pb			1	0.000	ug/l	---	1,250.07	1.286E-04	Pulse	0.10	3
Na			2	0.006	ug/l	1065.47	11,340.58	2.851E-02	Pulse	0.30	3
Mg			2	0.000	ug/l	5710.77	55.55	1.396E-04	Pulse	0.30	3
Al			2	-0.030	ug/l	-84.56	50.00	1.257E-04	Pulse	0.30	3
K			2	-0.741	ug/l	-104.10	11,710.90	2.945E-02	Pulse	0.30	3
Ca			2	-0.867	ug/l	-133.62	81.11	2.039E-04	Pulse	0.30	3
Ti			2	0.000	ug/l	---	23.33	5.867E-05	Pulse	0.30	3
V			2	0.000	ug/l	---	170.01	4.274E-04	Pulse	0.30	3
Cr			2	0.003	ug/l	156.42	406.68	1.022E-03	Pulse	0.30	3
Mn			2	0.118	ug/l	3.66	73.34	1.843E-04	Pulse	0.30	3
Fe			2	0.000	ug/l	---	2,721.37	6.843E-03	Pulse	0.30	3
Co			2	0.001	ug/l	114.73	53.32	1.341E-04	Pulse	0.30	3
Ni			2	0.000	ug/l	---	38.89	9.767E-05	Pulse	0.30	3
Cu			2	0.076	ug/l	31.17	17,423.80	4.381E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	0.000	ug/l	---	418.90	1.053E-03	Pulse	0.30	3
As			2	0.000	ug/l	---	30.67	7.710E-05	Pulse	1.00	3
Cd			2	0.000	ug/l	---	20.00	8.253E-06	Pulse	0.30	3
Sn			2	0.196	ug/l	5.49	481.13	1.983E-04	Pulse	0.30	3
Se			3	0.000	ug/l	---	20.80	3.279E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,204,837.93	0.63	100.0	Pulse	0.10	3
1	Sc		6,412,471.36	0.45	100.0	Analog	0.10	3
1	Ge		1,244,135.37	1.62	100.0	Pulse	0.10	3
1	Ge		1,738,218.88	1.35	100.0	Pulse	0.10	3
1	Rh		9,652,479.86	0.85	100.0	Analog	0.10	3
1	In		9,796,903.35	1.13	100.0	Analog	0.10	3
1	Tb		14,900,319.36	0.88	100.0	Analog	0.10	3
1	Ho		15,029,186.03	1.48	100.0	Analog	0.10	3
1	Bi		9,723,662.98	0.20	100.0	Analog	0.10	3
2	Sc		397,712.97	0.34	100.0	Pulse	0.30	3
2	Ge		240,147.34	0.16	100.0	Pulse	0.30	3
2	Ge		363,241.68	0.73	100.0	Pulse	0.30	3
2	Rh		6,745,886.68	0.15	100.0	Analog	0.30	3
2	In		2,426,691.61	0.53	100.0	Pulse	0.30	3
2	Tb		9,291,058.80	1.28	100.0	Analog	0.30	3
2	Ho		9,535,037.68	0.49	100.0	Analog	0.30	3
2	Bi		6,597,914.46	0.31	100.0	Analog	0.30	3
3	Sc		687,733.64	0.96	100.0	Pulse	0.30	3
3	Ge		423,865.10	1.01	100.0	Pulse	0.30	3
3	Ge		634,468.33	0.78	100.0	Pulse	0.30	3
3	Rh		6,363,429.33	0.89	100.0	Analog	0.30	3
3	Tb		10,774,427.63	1.74	100.0	Analog	0.30	3

Quantitation Report

File Name	004CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 9:55
Sample Name	STDB
Sample Type	CalStd
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.437	ug/l	2.83	2,985.64	9.396E-04	Pulse	0.25	3
B			1	23.877	ug/l	0.32	117,922.68	3.711E-02	Pulse	0.15	3
Ca			1	245.647	ug/l	1.24	212,366.77	3.349E-02	Pulse	0.10	3
Sr			1	4.395	ug/l	0.91	212,387.11	2.204E-02	Pulse	0.10	3
Mo			1	0.918	ug/l	5.73	8,335.90	8.651E-04	Pulse	0.10	3
Ag			1	0.470	ug/l	2.33	10,960.87	1.109E-03	Pulse	0.10	3
Sn			1	4.458	ug/l	1.25	66,933.10	6.774E-03	Pulse	0.10	3
Sb			1	2.050	ug/l	1.60	31,736.16	2.144E-03	Pulse	0.10	3
Ba			1	0.880	ug/l	4.94	6,434.91	4.347E-04	Pulse	0.10	3
Tl			1	0.421	ug/l	1.33	21,846.92	2.267E-03	Pulse	0.10	3
Pb			1	0.435	ug/l	2.42	7,945.74	8.244E-04	Pulse	0.10	3
Pb			1	0.424	ug/l	5.71	6,915.22	7.174E-04	Pulse	0.10	3
Pb			1	0.430	ug/l	2.42	31,968.11	3.317E-03	Pulse	0.10	3
Na			2	240.951	ug/l	0.86	355,573.76	8.922E-01	Pulse	0.30	3
Mg			2	243.115	ug/l	1.28	168,622.14	4.231E-01	Pulse	0.30	3
Al			2	26.105	ug/l	2.96	6,148.98	1.543E-02	Pulse	0.30	3
K			2	242.547	ug/l	1.09	132,205.48	3.317E-01	Pulse	0.30	3
Ca			2	265.492	ug/l	2.25	7,187.19	1.803E-02	Pulse	0.30	3
Ti			2	1.015	ug/l	8.01	228.89	5.745E-04	Pulse	0.30	3
V			2	0.914	ug/l	2.53	6,412.42	1.609E-02	Pulse	0.30	3
Cr			2	0.900	ug/l	3.43	8,373.33	2.101E-02	Pulse	0.30	3
Mn			2	1.005	ug/l	1.87	4,315.05	1.083E-02	Pulse	0.30	3
Fe			2	24.111	ug/l	0.92	168,427.30	4.226E-01	Pulse	0.30	3
Co			2	0.436	ug/l	2.69	6,254.14	1.569E-02	Pulse	0.30	3
Ni			2	0.881	ug/l	1.58	3,402.62	8.538E-03	Pulse	0.30	3
Cu			2	1.823	ug/l	4.25	35,725.52	8.965E-02	Pulse	0.30	3
Zn			2	4.317	ug/l	1.53	7,391.75	1.855E-02	Pulse	0.30	3
As			2	0.491	ug/l	7.40	433.34	1.088E-03	Pulse	1.00	3
Cd			2	0.442	ug/l	4.05	1,122.67	4.601E-04	Pulse	0.30	3
Sn			2	4.633	ug/l	1.87	22,289.27	9.135E-03	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	0.549	ug/l	2.74	162.27	2.563E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,177,571.36	0.40	99.1	Pulse	0.10	3
1	Sc		6,341,431.99	1.28	98.9	Analog	0.10	3
1	Ge		1,242,761.65	1.72	99.9	Pulse	0.10	3
1	Ge		1,729,725.75	0.94	99.5	Pulse	0.10	3
1	Rh		9,635,848.82	0.69	99.8	Analog	0.10	3
1	In		9,880,510.51	0.39	100.9	Analog	0.10	3
1	Tb		14,805,163.53	0.58	99.4	Analog	0.10	3
1	Ho		14,966,926.86	0.59	99.6	Analog	0.10	3
1	Bi		9,637,872.15	0.72	99.1	Analog	0.10	3
2	Sc		398,556.88	0.67	100.2	Pulse	0.30	3
2	Ge		242,223.47	0.19	100.9	Pulse	0.30	3
2	Ge		364,243.84	1.22	100.3	Pulse	0.30	3
2	Rh		6,778,467.65	0.29	100.5	Analog	0.30	3
2	In		2,439,958.23	0.65	100.5	Pulse	0.30	3
2	Tb		9,253,333.52	0.13	99.6	Analog	0.30	3
2	Ho		9,467,883.24	0.32	99.3	Analog	0.30	3
2	Bi		6,592,464.60	0.67	99.9	Analog	0.30	3
3	Sc		681,478.04	0.76	99.1	Pulse	0.30	3
3	Ge		420,632.88	0.53	99.2	Pulse	0.30	3
3	Ge		633,231.05	0.35	99.8	Pulse	0.30	3
3	Rh		6,330,637.66	0.09	99.5	Analog	0.30	3
3	Tb		10,814,524.01	1.65	100.4	Analog	0.30	3

Quantitation Report

File Name	005CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 10:00
Sample Name	STDC
Sample Type	CalStd
Comment	5
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	5.039	ug/l	0.20	34,365.24	1.073E-02	Pulse	0.25	3
B			1	5.568	ug/l	1.18	29,363.57	9.167E-03	Pulse	0.15	3
Ca			1	12.136	ug/l	6.25	17,743.50	2.796E-03	Pulse	0.10	3
Sr			1	4.943	ug/l	0.39	234,446.47	2.478E-02	Pulse	0.10	3
Mo			1	4.972	ug/l	0.57	44,101.38	4.662E-03	Pulse	0.10	3
Ag			1	4.926	ug/l	1.71	112,010.26	1.161E-02	Pulse	0.10	3
Sn			1	4.925	ug/l	0.79	72,088.70	7.473E-03	Pulse	0.10	3
Sb			1	5.169	ug/l	0.52	84,530.54	5.808E-03	Pulse	0.10	3
Ba			1	4.942	ug/l	3.06	35,451.35	2.436E-03	Pulse	0.10	3
Tl			1	4.710	ug/l	2.29	240,939.12	2.537E-02	Pulse	0.10	3
Pb			1	4.898	ug/l	1.44	85,879.31	9.042E-03	Pulse	0.10	3
Pb			1	4.847	ug/l	0.48	74,702.32	7.865E-03	Pulse	0.10	3
Pb			1	4.892	ug/l	0.77	345,534.97	3.638E-02	Pulse	0.10	3
Na			2	6.893	ug/l	5.24	20,802.18	5.320E-02	Pulse	0.30	3
Mg			2	5.640	ug/l	2.08	3,890.50	9.952E-03	Pulse	0.30	3
Al			2	5.831	ug/l	2.48	1,391.19	3.558E-03	Pulse	0.30	3
K			2	4.870	ug/l	5.92	14,239.51	3.642E-02	Pulse	0.30	3
Ca			2	32.189	ug/l	9.42	944.48	2.417E-03	Pulse	0.30	3
Ti			2	5.321	ug/l	7.21	1,080.05	2.763E-03	Pulse	0.30	3
V			2	5.024	ug/l	2.53	33,831.26	8.654E-02	Pulse	0.30	3
Cr			2	4.930	ug/l	0.76	43,314.37	1.108E-01	Pulse	0.30	3
Mn			2	5.144	ug/l	1.58	23,658.18	6.051E-02	Pulse	0.30	3
Fe			2	5.982	ug/l	1.53	43,002.63	1.100E-01	Pulse	0.30	3
Co			2	4.946	ug/l	2.03	69,191.97	1.770E-01	Pulse	0.30	3
Ni			2	4.950	ug/l	0.30	18,590.58	4.754E-02	Pulse	0.30	3
Cu			2	5.049	ug/l	0.54	68,165.91	1.743E-01	Pulse	0.30	3
Zn			2	5.203	ug/l	3.50	8,653.49	2.214E-02	Pulse	0.30	3
As			2	4.998	ug/l	2.45	4,054.52	1.037E-02	Pulse	1.00	3
Cd			2	4.945	ug/l	2.38	12,163.29	5.065E-03	Pulse	0.30	3
Sn			2	5.188	ug/l	1.65	24,620.49	1.025E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	5.433	ug/l	0.93	1,411.53	2.246E-03	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,202,901.70	1.07	99.9	Pulse	0.10	3
1	Sc		6,346,969.07	1.01	99.0	Analog	0.10	3
1	Ge		1,246,623.13	0.73	100.2	Pulse	0.10	3
1	Ge		1,726,175.91	1.21	99.3	Pulse	0.10	3
1	Rh		9,459,923.61	0.72	98.0	Analog	0.10	3
1	In		9,647,088.39	0.30	98.5	Analog	0.10	3
1	Tb		14,555,068.12	1.51	97.7	Analog	0.10	3
1	Ho		14,770,865.61	0.66	98.3	Analog	0.10	3
1	Bi		9,497,583.40	0.49	97.7	Analog	0.10	3
2	Sc		391,009.78	1.31	98.3	Pulse	0.30	3
2	Ge		239,811.96	0.57	99.9	Pulse	0.30	3
2	Ge		360,871.66	0.49	99.3	Pulse	0.30	3
2	Rh		6,718,153.06	1.37	99.6	Analog	0.30	3
2	In		2,401,483.87	0.21	99.0	Pulse	0.30	3
2	Tb		9,188,507.97	1.17	98.9	Analog	0.30	3
2	Ho		9,438,625.74	0.83	99.0	Analog	0.30	3
2	Bi		6,541,414.46	0.40	99.1	Analog	0.30	3
3	Sc		665,742.40	0.77	96.8	Pulse	0.30	3
3	Ge		416,215.40	0.22	98.2	Pulse	0.30	3
3	Ge		628,503.55	0.38	99.1	Pulse	0.30	3
3	Rh		6,396,450.16	1.11	100.5	Analog	0.30	3
3	Tb		10,808,762.90	0.44	100.3	Analog	0.30	3

Quantitation Report

File Name	006CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 10:05
Sample Name	STDD
Sample Type	CalStd
Comment	25
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	24.722	ug/l	0.73	168,407.65	5.260E-02	Pulse	0.25	3
B			1	25.843	ug/l	1.26	128,424.01	4.011E-02	Pulse	0.15	3
Ca			1	36.973	ug/l	2.20	38,208.27	6.061E-03	Pulse	0.10	3
Sr			1	24.175	ug/l	1.37	1,156,857.43	1.210E-01	Pulse	0.10	3
Mo			1	24.539	ug/l	1.50	219,778.50	2.299E-02	Pulse	0.10	3
Ag			1	24.676	ug/l	2.05	562,504.82	5.815E-02	Pulse	0.10	3
Sn			1	24.703	ug/l	1.07	358,211.17	3.703E-02	Pulse	0.10	3
Sb			1	24.450	ug/l	1.02	414,383.59	2.846E-02	Pulse	0.10	3
Ba			1	24.541	ug/l	1.05	176,062.49	1.209E-02	Pulse	0.10	3
Tl			1	23.896	ug/l	1.90	1,226,447.98	1.287E-01	Pulse	0.10	3
Pb			1	24.434	ug/l	2.57	428,878.11	4.501E-02	Pulse	0.10	3
Pb			1	24.523	ug/l	1.70	377,927.09	3.967E-02	Pulse	0.10	3
Pb			1	24.472	ug/l	1.68	1,729,095.05	1.815E-01	Pulse	0.10	3
Na			2	26.952	ug/l	0.43	48,708.64	1.251E-01	Pulse	0.30	3
Mg			2	26.014	ug/l	1.19	17,676.02	4.540E-02	Pulse	0.30	3
Al			2	27.273	ug/l	3.08	6,273.47	1.611E-02	Pulse	0.30	3
K			2	24.233	ug/l	1.72	23,546.74	6.048E-02	Pulse	0.30	3
Ca			2	137.899	ug/l	0.71	3,696.02	9.493E-03	Pulse	0.30	3
Ti			2	24.280	ug/l	1.28	4,827.42	1.240E-02	Pulse	0.30	3
V			2	24.923	ug/l	0.54	166,488.30	4.276E-01	Pulse	0.30	3
Cr			2	24.794	ug/l	0.78	215,385.32	5.532E-01	Pulse	0.30	3
Mn			2	24.726	ug/l	0.81	115,072.17	2.956E-01	Pulse	0.30	3
Fe			2	25.671	ug/l	0.11	175,014.71	4.495E-01	Pulse	0.30	3
Co			2	24.769	ug/l	0.21	344,896.98	8.858E-01	Pulse	0.30	3
Ni			2	24.593	ug/l	1.06	91,813.68	2.358E-01	Pulse	0.30	3
Cu			2	24.952	ug/l	0.59	271,245.00	6.967E-01	Pulse	0.30	3
Zn			2	24.259	ug/l	1.09	38,683.36	9.935E-02	Pulse	0.30	3
As			2	24.824	ug/l	1.70	19,935.48	5.120E-02	Pulse	1.00	3
Cd			2	24.783	ug/l	0.19	60,757.43	2.535E-02	Pulse	0.30	3
Sn			2	24.834	ug/l	0.29	119,418.87	4.982E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	26.949	ug/l	1.21	6,851.36	1.101E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,201,508.54	0.81	99.9	Pulse	0.10	3
1	Sc		6,304,169.49	0.39	98.3	Analog	0.10	3
1	Ge		1,243,192.38	1.55	99.9	Pulse	0.10	3
1	Ge		1,737,965.55	1.57	100.0	Pulse	0.10	3
1	Rh		9,559,963.61	0.64	99.0	Analog	0.10	3
1	In		9,672,049.36	0.69	98.7	Analog	0.10	3
1	Tb		14,562,078.12	1.15	97.7	Analog	0.10	3
1	Ho		14,875,406.03	1.11	99.0	Analog	0.10	3
1	Bi		9,527,847.77	0.09	98.0	Analog	0.10	3
2	Sc		389,344.54	0.54	97.9	Pulse	0.30	3
2	Ge		239,003.40	0.09	99.5	Pulse	0.30	3
2	Ge		359,341.34	0.79	98.9	Pulse	0.30	3
2	Rh		6,628,279.18	0.24	98.3	Analog	0.30	3
2	In		2,396,816.79	0.54	98.8	Pulse	0.30	3
2	Tb		9,192,514.08	0.26	98.9	Analog	0.30	3
2	Ho		9,392,497.68	1.13	98.5	Analog	0.30	3
2	Bi		6,502,585.72	1.04	98.6	Analog	0.30	3
3	Sc		661,828.18	0.77	96.2	Pulse	0.30	3
3	Ge		413,892.25	0.89	97.6	Pulse	0.30	3
3	Ge		622,331.03	0.47	98.1	Pulse	0.30	3
3	Rh		6,400,709.61	0.51	100.6	Analog	0.30	3
3	Tb		10,877,233.46	1.04	101.0	Analog	0.30	3

Quantitation Report

File Name	007CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 10:10
Sample Name	STDE
Sample Type	CalStd
Comment	50
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	50.061	ug/l	1.85	335,752.78	1.065E-01	Pulse	0.25	3
B			1	52.085	ug/l	0.96	252,714.57	8.016E-02	Pulse	0.15	3
Ca			1	75.205	ug/l	1.15	68,578.44	1.109E-02	Pulse	0.10	3
Sr			1	50.078	ug/l	2.03	2,326,005.54	2.506E-01	Pulse	0.10	3
Mo			1	50.093	ug/l	1.94	435,500.34	4.692E-02	Pulse	0.10	3
Ag			1	51.795	ug/l	1.29	1,154,952.85	1.221E-01	Pulse	0.10	3
Sn			1	49.997	ug/l	0.94	708,156.22	7.484E-02	Pulse	0.10	3
Sb			1	49.830	ug/l	1.78	843,009.57	5.827E-02	Pulse	0.10	3
Ba			1	49.710	ug/l	1.57	354,305.06	2.449E-02	Pulse	0.10	3
Tl			1	49.316	ug/l	2.88	2,476,071.79	2.657E-01	Pulse	0.10	3
Pb			1	50.576	ug/l	2.50	868,174.31	9.314E-02	Pulse	0.10	3
Pb			1	50.475	ug/l	2.55	760,653.71	8.161E-02	Pulse	0.10	3
Pb			1	50.411	ug/l	2.52	3,483,141.43	3.737E-01	Pulse	0.10	3
Na			2	53.522	ug/l	0.90	84,295.64	2.203E-01	Pulse	0.30	3
Mg			2	52.515	ug/l	0.70	35,006.22	9.150E-02	Pulse	0.30	3
Al			2	52.050	ug/l	0.77	11,715.31	3.062E-02	Pulse	0.30	3
K			2	51.932	ug/l	1.25	36,301.65	9.489E-02	Pulse	0.30	3
Ca			2	280.309	ug/l	5.60	7,279.47	1.903E-02	Pulse	0.30	3
Ti			2	49.700	ug/l	3.27	9,685.17	2.532E-02	Pulse	0.30	3
V			2	50.009	ug/l	0.91	328,083.69	8.576E-01	Pulse	0.30	3
Cr			2	50.104	ug/l	0.22	427,307.20	1.117E+00	Pulse	0.30	3
Mn			2	49.890	ug/l	0.37	228,619.06	5.976E-01	Pulse	0.30	3
Fe			2	52.838	ug/l	0.92	351,178.94	9.180E-01	Pulse	0.30	3
Co			2	50.000	ug/l	0.41	684,075.40	1.788E+00	Pulse	0.30	3
Ni			2	49.882	ug/l	0.74	182,942.90	4.782E-01	Pulse	0.30	3
Cu			2	49.970	ug/l	0.37	517,700.83	1.353E+00	Pulse	0.30	3
Zn			2	49.633	ug/l	0.45	77,344.50	2.022E-01	Pulse	0.30	3
As			2	49.994	ug/l	1.01	39,421.68	1.030E-01	Pulse	1.00	3
Cd			2	50.112	ug/l	0.14	121,264.35	5.125E-02	Pulse	0.30	3
Sn			2	50.555	ug/l	0.46	240,478.55	1.016E-01	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	54.251	ug/l	0.98	13,673.49	2.213E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,152,597.81	0.48	98.4	Pulse	0.10	3
1	Sc		6,185,908.66	0.22	96.5	Analog	0.10	3
1	Ge		1,221,138.08	1.61	98.2	Pulse	0.10	3
1	Ge		1,713,256.75	1.51	98.6	Pulse	0.10	3
1	Rh		9,282,024.24	0.80	96.2	Analog	0.10	3
1	In		9,461,676.35	0.80	96.6	Analog	0.10	3
1	Tb		14,467,967.28	0.53	97.1	Analog	0.10	3
1	Ho		14,649,821.86	0.66	97.5	Analog	0.10	3
1	Bi		9,321,597.57	0.74	95.9	Analog	0.10	3
2	Sc		382,561.52	0.31	96.2	Pulse	0.30	3
2	Ge		234,545.92	0.78	97.7	Pulse	0.30	3
2	Ge		352,754.05	0.98	97.1	Pulse	0.30	3
2	Rh		6,564,797.51	0.63	97.3	Analog	0.30	3
2	In		2,366,194.70	0.09	97.5	Pulse	0.30	3
2	Tb		9,019,844.64	0.67	97.1	Analog	0.30	3
2	Ho		9,180,602.69	1.30	96.3	Analog	0.30	3
2	Bi		6,412,817.52	0.93	97.2	Analog	0.30	3
3	Sc		653,833.60	0.62	95.1	Pulse	0.30	3
3	Ge		409,274.85	0.73	96.6	Pulse	0.30	3
3	Ge		617,853.73	0.31	97.4	Pulse	0.30	3
3	Rh		6,377,459.74	1.44	100.2	Analog	0.30	3
3	Tb		10,842,183.46	0.62	100.6	Analog	0.30	3

Quantitation Report

File Name	008CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 10:15
Sample Name	STDF
Sample Type	CalStd
Comment	100
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	98.924	ug/l	0.28	660,676.42	2.105E-01	Pulse	0.25	3
B			1	103.920	ug/l	0.36	499,989.63	1.593E-01	Pulse	0.15	3
Ca			1	135.916	ug/l	0.74	116,177.70	1.907E-02	Pulse	0.10	3
Sr			1	100.198	ug/l	0.81	4,584,198.47	5.014E-01	Pulse	0.10	3
Mo			1	101.184	ug/l	0.64	866,498.50	9.477E-02	Pulse	0.10	3
Ag			1	100.052	ug/l	0.77	2,213,656.01	2.358E-01	Pulse	0.10	3
Sn			1	100.910	ug/l	1.29	1,417,149.67	1.509E-01	Pulse	0.10	3
Sb			1	100.213	ug/l	1.43	1,668,149.25	1.175E-01	Pulse	0.10	3
Ba			1	100.963	ug/l	2.25	706,395.93	4.974E-02	Pulse	0.10	3
Tl			1	100.633	ug/l	6.03	5,082,585.55	5.421E-01	Mix	0.10	3
Pb			1	99.859	ug/l	2.83	1,724,075.75	1.839E-01	Pulse	0.10	3
Pb			1	99.890	ug/l	2.79	1,513,930.08	1.615E-01	Pulse	0.10	3
Pb			1	99.932	ug/l	2.53	6,944,424.32	7.407E-01	Pulse	0.10	3
Na			2	103.976	ug/l	0.25	150,860.58	4.012E-01	Pulse	0.30	3
Mg			2	101.610	ug/l	0.68	66,525.48	1.769E-01	Pulse	0.30	3
Al			2	103.733	ug/l	0.61	22,895.65	6.089E-02	Pulse	0.30	3
K			2	100.139	ug/l	0.23	58,204.09	1.548E-01	Pulse	0.30	3
Ca			2	524.205	ug/l	2.15	13,293.22	3.535E-02	Pulse	0.30	3
Ti			2	100.314	ug/l	1.54	19,192.32	5.104E-02	Pulse	0.30	3
V			2	100.014	ug/l	0.40	644,774.14	1.715E+00	Pulse	0.30	3
Cr			2	100.390	ug/l	0.88	841,160.35	2.237E+00	Pulse	0.30	3
Mn			2	100.116	ug/l	0.99	451,403.21	1.200E+00	Pulse	0.30	3
Fe			2	101.119	ug/l	0.58	658,233.27	1.751E+00	Pulse	0.30	3
Co			2	100.362	ug/l	0.23	1,349,575.08	3.589E+00	Pulse	0.30	3
Ni			2	100.165	ug/l	0.18	361,049.27	9.602E-01	Pulse	0.30	3
Cu			2	100.143	ug/l	0.38	1,004,006.77	2.670E+00	Pulse	0.30	3
Zn			2	100.403	ug/l	0.74	153,381.94	4.079E-01	Pulse	0.30	3
As			2	100.047	ug/l	0.66	77,510.99	2.061E-01	Pulse	1.00	3
Cd			2	100.001	ug/l	0.69	241,771.47	1.023E-01	Pulse	0.30	3
Sn			2	99.783	ug/l	0.46	474,714.22	2.008E-01	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	107.058	ug/l	0.64	26,912.96	4.364E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,139,271.01	1.15	98.0	Pulse	0.10	3
1	Sc		6,093,565.53	0.71	95.0	Analog	0.10	3
1	Ge		1,215,518.03	1.63	97.7	Pulse	0.10	3
1	Ge		1,706,370.55	2.41	98.2	Pulse	0.10	3
1	Rh		9,142,377.16	1.79	94.7	Analog	0.10	3
1	In		9,387,945.13	1.49	95.8	Analog	0.10	3
1	Tb		14,202,128.54	1.28	95.3	Analog	0.10	3
1	Ho		14,378,561.87	2.02	95.7	Analog	0.10	3
1	Bi		9,376,007.98	0.33	96.4	Analog	0.10	3
2	Sc		376,026.52	0.31	94.5	Pulse	0.30	3
2	Ge		233,658.77	0.55	97.3	Pulse	0.30	3
2	Ge		350,959.85	0.61	96.6	Pulse	0.30	3
2	Rh		6,492,183.08	0.99	96.2	Analog	0.30	3
2	In		2,364,352.50	1.09	97.4	Pulse	0.30	3
2	Tb		8,921,390.76	1.17	96.0	Analog	0.30	3
2	Ho		9,104,794.08	0.22	95.5	Analog	0.30	3
2	Bi		6,328,200.72	0.71	95.9	Analog	0.30	3
3	Sc		647,446.07	1.37	94.1	Pulse	0.30	3
3	Ge		407,296.94	0.93	96.1	Pulse	0.30	3
3	Ge		616,730.79	1.16	97.2	Pulse	0.30	3
3	Rh		6,286,410.86	0.92	98.8	Analog	0.30	3
3	Tb		10,815,141.51	0.64	100.4	Analog	0.30	3

Quantitation Report

File Name	009CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 10:20
Sample Name	STDG
Sample Type	CalStd
Comment	500MIN
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.007	ug/l	67.28	80.00	2.572E-05	Pulse	0.25	3
B			1	209.541	ug/l	0.73	998,525.20	3.205E-01	Pulse	0.15	3
Ca			1	516.201	ug/l	2.03	417,933.90	6.905E-02	Pulse	0.10	3
Sr			1	0.022	ug/l	10.48	1,480.13	1.605E-04	Pulse	0.10	3
Mo			1	0.234	ug/l	11.19	2,070.21	2.246E-04	Pulse	0.10	3
Ag			1	0.147	ug/l	5.84	3,293.79	3.477E-04	Pulse	0.10	3
Sn			1	0.643	ug/l	6.97	10,153.75	1.072E-03	Pulse	0.10	3
Sb			1	1.530	ug/l	5.10	22,039.47	1.533E-03	Pulse	0.10	3
Ba			1	0.037	ug/l	5.10	283.34	1.972E-05	Pulse	0.10	3
Tl			1	0.034	ug/l	10.50	1,696.83	1.815E-04	Pulse	0.10	3
Pb			1	0.029	ug/l	7.26	710.05	7.593E-05	Pulse	0.10	3
Pb			1	0.020	ug/l	9.53	606.70	6.490E-05	Pulse	0.10	3
Pb			1	0.025	ug/l	11.02	2,946.91	3.153E-04	Pulse	0.10	3
Na			2	505.933	ug/l	0.58	702,667.19	1.842E+00	Pulse	0.30	3
Mg			2	502.157	ug/l	0.62	333,316.31	8.738E-01	Pulse	0.30	3
Al			2	508.976	ug/l	1.89	113,745.93	2.982E-01	Pulse	0.30	3
K			2	499.972	ug/l	0.84	248,546.36	6.516E-01	Pulse	0.30	3
Ca			2	512.018	ug/l	1.44	13,174.25	3.454E-02	Pulse	0.30	3
Ti			2	-0.006	ug/l	-893.57	21.11	5.547E-05	Pulse	0.30	3
V			2	0.005	ug/l	28.17	197.78	5.184E-04	Pulse	0.30	3
Cr			2	0.050	ug/l	12.48	788.92	2.069E-03	Pulse	0.30	3
Mn			2	0.149	ug/l	1.63	208.89	5.477E-04	Pulse	0.30	3
Fe			2	500.167	ug/l	0.16	3,292,694.87	8.632E+00	Pulse	0.30	3
Co			2	0.028	ug/l	12.81	424.45	1.113E-03	Pulse	0.30	3
Ni			2	0.043	ug/l	23.90	193.34	5.072E-04	Pulse	0.30	3
Cu			2	-0.216	ug/l	-13.47	13,784.77	3.614E-02	Pulse	0.30	3
Zn			2	0.306	ug/l	17.99	874.48	2.291E-03	Pulse	0.30	3
As			2	0.013	ug/l	27.40	40.00	1.048E-04	Pulse	1.00	3
Cd			2	0.002	ug/l	411.31	25.30	1.065E-05	Pulse	0.30	3
Sn			2	1.063	ug/l	5.13	4,599.61	1.944E-03	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	199.093	ug/l	0.51	50,943.64	8.113E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,115,925.64	0.92	97.2	Pulse	0.10	3
1	Sc		6,052,793.87	0.52	94.4	Analog	0.10	3
1	Ge		1,210,079.18	0.74	97.3	Pulse	0.10	3
1	Ge		1,688,047.21	1.10	97.1	Pulse	0.10	3
1	Rh		9,224,534.65	0.84	95.6	Analog	0.10	3
1	In		9,470,603.49	0.54	96.7	Analog	0.10	3
1	Tb		14,370,049.37	0.73	96.4	Analog	0.10	3
1	Ho		14,520,858.12	0.73	96.6	Analog	0.10	3
1	Bi		9,349,785.28	0.69	96.2	Analog	0.10	3
2	Sc		381,473.37	0.72	95.9	Pulse	0.30	3
2	Ge		234,957.63	0.70	97.8	Pulse	0.30	3
2	Ge		353,830.12	1.00	97.4	Pulse	0.30	3
2	Rh		6,566,792.93	0.45	97.3	Analog	0.30	3
2	In		2,365,323.02	1.00	97.5	Pulse	0.30	3
2	Tb		9,035,888.53	0.22	97.3	Analog	0.30	3
2	Ho		9,193,523.80	1.41	96.4	Analog	0.30	3
2	Bi		6,430,771.41	0.88	97.5	Analog	0.30	3
3	Sc		662,950.86	0.41	96.4	Pulse	0.30	3
3	Ge		415,058.29	0.79	97.9	Pulse	0.30	3
3	Ge		627,957.56	0.80	99.0	Pulse	0.30	3
3	Rh		6,383,864.05	0.60	100.3	Analog	0.30	3
3	Tb		10,961,261.23	1.48	101.7	Analog	0.30	3

Quantitation Report

File Name	010CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 10:25
Sample Name	STDH
Sample Type	CalStd
Comment	1000MIN
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.002	ug/l	112.65	48.00	1.492E-05	Pulse	0.25	3
B			1	6.378	ug/l	3.71	33,370.91	1.040E-02	Pulse	0.15	3
Ca			1	1000.217	ug/l	0.40	851,758.14	1.327E-01	Pulse	0.10	3
Sr			1	0.017	ug/l	13.77	1,253.44	1.332E-04	Pulse	0.10	3
Mo			1	0.062	ug/l	15.70	603.37	6.406E-05	Pulse	0.10	3
Ag			1	0.284	ug/l	2.87	6,468.21	6.704E-04	Pulse	0.10	3
Sn			1	0.206	ug/l	5.71	4,047.36	4.194E-04	Pulse	0.10	3
Sb			1	0.777	ug/l	1.86	9,386.49	6.489E-04	Pulse	0.10	3
Ba			1	0.030	ug/l	44.88	230.01	1.589E-05	Pulse	0.10	3
Tl			1	0.009	ug/l	21.52	473.36	5.021E-05	Pulse	0.10	3
Pb			1	0.018	ug/l	46.05	536.69	5.695E-05	Pulse	0.10	3
Pb			1	0.007	ug/l	21.87	420.02	4.453E-05	Pulse	0.10	3
Pb			1	0.014	ug/l	21.76	2,156.82	2.289E-04	Pulse	0.10	3
Na			2	1000.219	ug/l	0.53	1,417,224.77	3.614E+00	Pulse	0.30	3
Mg			2	988.444	ug/l	0.97	674,457.31	1.720E+00	Pulse	0.30	3
Al			2	1012.606	ug/l	0.66	232,606.38	5.931E-01	Pulse	0.30	3
K			2	999.011	ug/l	0.18	498,687.65	1.272E+00	Pulse	0.30	3
Ca			2	1010.605	ug/l	1.54	26,633.65	6.791E-02	Pulse	0.30	3
Ti			2	0.002	ug/l	1028.45	23.33	5.950E-05	Pulse	0.30	3
V			2	0.005	ug/l	28.10	200.00	5.100E-04	Pulse	0.30	3
Cr			2	0.034	ug/l	16.51	671.14	1.711E-03	Pulse	0.30	3
Mn			2	0.147	ug/l	3.33	206.67	5.269E-04	Pulse	0.30	3
Fe			2	1028.447	ug/l	1.10	6,957,543.34	1.774E+01	Analog	0.30	3
Co			2	0.039	ug/l	9.04	597.90	1.524E-03	Pulse	0.30	3
Ni			2	0.060	ug/l	11.33	262.23	6.686E-04	Pulse	0.30	3
Cu			2	-0.293	ug/l	-7.12	13,385.56	3.413E-02	Pulse	0.30	3
Zn			2	0.153	ug/l	27.03	655.58	1.672E-03	Pulse	0.30	3
As			2	0.020	ug/l	78.92	46.33	1.182E-04	Pulse	1.00	3
Cd			2	0.002	ug/l	259.42	24.38	1.012E-05	Pulse	0.30	3
Sn			2	0.440	ug/l	5.14	1,661.22	6.900E-04	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	398.030	ug/l	0.46	103,002.84	1.622E-01	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,208,067.90	1.23	100.1	Pulse	0.10	3
1	Sc		6,420,186.78	1.26	100.1	Analog	0.10	3
1	Ge		1,240,446.52	0.94	99.7	Pulse	0.10	3
1	Ge		1,736,879.40	1.18	99.9	Pulse	0.10	3
1	Rh		9,413,590.28	0.79	97.5	Analog	0.10	3
1	In		9,650,583.04	1.03	98.5	Analog	0.10	3
1	Tb		14,465,358.12	0.36	97.1	Analog	0.10	3
1	Ho		14,752,151.86	1.08	98.2	Analog	0.10	3
1	Bi		9,427,702.15	1.32	97.0	Analog	0.10	3
2	Sc		392,172.75	0.21	98.6	Pulse	0.30	3
2	Ge		240,620.64	1.37	100.2	Pulse	0.30	3
2	Ge		364,250.70	0.74	100.3	Pulse	0.30	3
2	Rh		6,685,251.54	0.83	99.1	Analog	0.30	3
2	In		2,407,388.61	0.27	99.2	Pulse	0.30	3
2	Tb		9,156,340.75	0.05	98.6	Analog	0.30	3
2	Ho		9,309,654.08	0.54	97.6	Analog	0.30	3
2	Bi		6,381,979.61	0.61	96.7	Analog	0.30	3
3	Sc		671,021.94	0.79	97.6	Pulse	0.30	3
3	Ge		419,251.87	0.42	98.9	Pulse	0.30	3
3	Ge		635,193.12	0.15	100.1	Pulse	0.30	3
3	Rh		6,454,632.24	0.96	101.4	Analog	0.30	3
3	Tb		11,080,352.61	1.58	102.8	Analog	0.30	3

Quantitation Report

File Name	011CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 10:30
Sample Name	STDI
Sample Type	CalStd
Comment	5000MIN
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.001	ug/l	52.62	41.33	1.284E-05	Pulse	0.25	3
B			1	3.402	ug/l	3.59	18,864.12	5.863E-03	Pulse	0.15	3
Ca			1	4978.806	ug/l	1.03	4,201,382.44	6.556E-01	Pulse	0.10	3
Sr			1	0.047	ug/l	7.06	2,643.66	2.829E-04	Pulse	0.10	3
Mo			1	0.026	ug/l	34.39	280.01	2.994E-05	Pulse	0.10	3
Ag			1	0.002	ug/l	71.80	70.00	7.297E-06	Pulse	0.10	3
Sn			1	0.178	ug/l	5.12	3,620.59	3.766E-04	Pulse	0.10	3
Sb			1	0.594	ug/l	6.36	6,234.83	4.339E-04	Pulse	0.10	3
Ba			1	0.028	ug/l	38.27	220.02	1.525E-05	Pulse	0.10	3
Tl			1	0.006	ug/l	20.29	286.68	3.091E-05	Pulse	0.10	3
Pb			1	0.017	ug/l	26.38	506.69	5.472E-05	Pulse	0.10	3
Pb			1	0.012	ug/l	38.68	483.36	5.215E-05	Pulse	0.10	3
Pb			1	0.012	ug/l	8.96	2,033.47	2.195E-04	Pulse	0.10	3
Na			2	5048.766	ug/l	1.20	7,251,351.38	1.813E+01	Analog	0.30	3
Mg			2	4861.596	ug/l	0.74	3,383,640.70	8.458E+00	Pulse	0.30	3
Al			2	4957.830	ug/l	0.65	1,161,517.25	2.903E+00	Pulse	0.30	3
K			2	4888.432	ug/l	0.55	2,441,888.45	6.104E+00	Pulse	0.30	3
Ca			2	4906.995	ug/l	0.72	131,514.01	3.287E-01	Pulse	0.30	3
Ti			2	-0.039	ug/l	-86.14	15.55	3.882E-05	Pulse	0.30	3
V			2	0.005	ug/l	143.00	207.78	5.196E-04	Pulse	0.30	3
Cr			2	0.046	ug/l	15.52	797.81	1.994E-03	Pulse	0.30	3
Mn			2	0.200	ug/l	2.94	464.46	1.161E-03	Pulse	0.30	3
Fe			2	4898.440	ug/l	0.90	33,792,229.77	8.447E+01	Analog	0.30	3
Co			2	0.206	ug/l	1.27	2,995.75	7.489E-03	Pulse	0.30	3
Ni			2	0.267	ug/l	5.88	1,062.27	2.656E-03	Pulse	0.30	3
Cu			2	-0.398	ug/l	-9.30	12,551.57	3.137E-02	Pulse	0.30	3
Zn			2	0.409	ug/l	3.83	1,084.50	2.711E-03	Pulse	0.30	3
As			2	0.033	ug/l	14.08	58.33	1.458E-04	Pulse	1.00	3
Cd			2	0.000	ug/l	-7201.85	19.96	8.220E-06	Pulse	0.30	3
Sn			2	0.385	ug/l	3.88	1,404.52	5.788E-04	Pulse	0.30	3
Se			3	0.193	ug/l	6.16	70.13	1.112E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,217,483.37	1.09	100.4	Pulse	0.10	3
1	Sc		6,407,841.57	0.75	99.9	Analog	0.10	3
1	Ge		1,252,162.43	1.47	100.6	Pulse	0.10	3

Quantitation Report

1	Ge		1,738,746.69	1.93	100.0	Pulse	0.10	3
1	Rh		9,344,902.78	0.45	96.8	Analog	0.10	3
1	In		9,614,728.45	0.58	98.1	Analog	0.10	3
1	Tb		14,376,093.95	1.50	96.5	Analog	0.10	3
1	Ho		14,845,589.36	1.24	98.8	Analog	0.10	3
1	Bi		9,264,797.78	0.80	95.3	Analog	0.10	3
2	Sc		400,042.30	0.53	100.6	Pulse	0.30	3
2	Ge		242,329.43	0.34	100.9	Pulse	0.30	3
2	Ge		365,706.17	0.70	100.7	Pulse	0.30	3
2	Rh		6,627,081.41	0.35	98.2	Analog	0.30	3
2	In		2,426,770.00	0.65	100.0	Pulse	0.30	3
2	Tb		9,141,628.81	1.16	98.4	Analog	0.30	3
2	Ho		9,334,774.63	0.43	97.9	Analog	0.30	3
2	Bi		6,328,460.58	0.11	95.9	Analog	0.30	3
3	Sc		675,355.22	0.53	98.2	Pulse	0.30	3
3	Ge		418,412.52	0.53	98.7	Pulse	0.30	3
3	Ge		630,639.99	0.29	99.4	Pulse	0.30	3
3	Rh		6,302,260.03	0.39	99.0	Analog	0.30	3
3	Tb		10,894,182.90	0.93	101.1	Analog	0.30	3

Quantitation Report

File Name	012CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 10:34
Sample Name	STDI
Sample Type	CalStd
Comment	5000MIN
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.002	ug/l	215.08	44.00	1.353E-05	Pulse	0.25	3
B			1	2.318	ug/l	1.33	13,743.64	4.207E-03	Pulse	0.15	3
Ca			1	4821.486	ug/l	2.45	4,184,031.29	6.350E-01	Pulse	0.10	3
Sr			1	0.044	ug/l	12.88	2,560.30	2.703E-04	Pulse	0.10	3
Mo			1	0.019	ug/l	23.38	220.01	2.309E-05	Pulse	0.10	3
Ag			1	0.003	ug/l	45.86	86.67	8.864E-06	Pulse	0.10	3
Sn			1	0.135	ug/l	2.24	3,067.09	3.124E-04	Pulse	0.10	3
Sb			1	0.500	ug/l	4.62	4,777.57	3.234E-04	Pulse	0.10	3
Ba			1	0.023	ug/l	41.28	190.01	1.288E-05	Pulse	0.10	3
Tl			1	0.005	ug/l	44.12	240.01	2.563E-05	Pulse	0.10	3
Pb			1	0.014	ug/l	31.37	463.36	4.947E-05	Pulse	0.10	3
Pb			1	0.013	ug/l	51.25	506.69	5.394E-05	Pulse	0.10	3
Pb			1	0.011	ug/l	12.43	1,976.79	2.106E-04	Pulse	0.10	3
Na			2	4986.704	ug/l	1.91	7,182,311.66	1.790E+01	Analog	0.30	3
Mg			2	4842.906	ug/l	0.97	3,380,442.78	8.426E+00	Pulse	0.30	3
Al			2	4941.363	ug/l	1.16	1,160,994.74	2.894E+00	Pulse	0.30	3
K			2	4881.637	ug/l	1.08	2,445,567.96	6.096E+00	Pulse	0.30	3
Ca			2	4943.861	ug/l	0.63	132,895.54	3.312E-01	Pulse	0.30	3
Ti			2	0.032	ug/l	88.42	30.00	7.476E-05	Pulse	0.30	3
V			2	0.007	ug/l	59.21	221.11	5.515E-04	Pulse	0.30	3
Cr			2	0.055	ug/l	17.00	878.92	2.189E-03	Pulse	0.30	3
Mn			2	0.215	ug/l	3.95	538.90	1.343E-03	Pulse	0.30	3
Fe			2	4922.575	ug/l	0.43	34,061,516.42	8.489E+01	Analog	0.30	3
Co			2	0.202	ug/l	1.72	2,943.91	7.337E-03	Pulse	0.30	3
Ni			2	0.258	ug/l	2.48	1,032.27	2.572E-03	Pulse	0.30	3
Cu			2	-0.276	ug/l	-10.51	13,872.65	3.457E-02	Pulse	0.30	3
Zn			2	0.438	ug/l	12.62	1,133.39	2.826E-03	Pulse	0.30	3
As			2	0.024	ug/l	14.01	51.00	1.271E-04	Pulse	1.00	3
Cd			2	0.009	ug/l	15.86	43.31	1.788E-05	Pulse	0.30	3
Sn			2	0.358	ug/l	6.10	1,273.40	5.253E-04	Pulse	0.30	3
Se			3	0.116	ug/l	5.12	50.67	8.008E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,267,062.39	1.44	101.9	Pulse	0.10	3
1	Sc		6,591,674.49	2.58	102.8	Analog	0.10	3
1	Ge		1,271,193.58	2.87	102.2	Pulse	0.10	3

Quantitation Report

1	Ge		1,771,628.77	2.62	101.9	Pulse	0.10	3
1	Rh		9,493,200.49	3.15	98.3	Analog	0.10	3
1	In		9,819,712.23	1.95	100.2	Analog	0.10	3
1	Tb		14,786,144.37	2.56	99.2	Analog	0.10	3
1	Ho		15,166,142.69	2.14	100.9	Analog	0.10	3
1	Bi		9,384,921.94	1.87	96.5	Analog	0.10	3
2	Sc		401,239.58	1.39	100.9	Pulse	0.30	3
2	Ge		242,595.77	1.32	101.0	Pulse	0.30	3
2	Ge		364,092.47	0.90	100.2	Pulse	0.30	3
2	Rh		6,568,584.32	0.21	97.4	Analog	0.30	3
2	In		2,423,407.64	1.02	99.9	Pulse	0.30	3
2	Tb		9,213,089.08	0.39	99.2	Analog	0.30	3
2	Ho		9,357,461.57	0.52	98.1	Analog	0.30	3
2	Bi		6,363,510.30	1.05	96.4	Analog	0.30	3
3	Sc		674,068.46	0.48	98.0	Pulse	0.30	3
3	Ge		418,835.96	0.20	98.8	Pulse	0.30	3
3	Ge		632,594.00	0.74	99.7	Pulse	0.30	3
3	Rh		6,353,291.83	1.30	99.8	Analog	0.30	3
3	Tb		11,066,453.73	1.38	102.7	Analog	0.30	3

Quantitation Report

File Name	013CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 10:39
Sample Name	STDJ
Sample Type	CalStd
Comment	10000MIN
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.004	ug/l	82.65	60.00	1.877E-05	Pulse	0.25	3
B			1	1.918	ug/l	0.79	11,508.60	3.598E-03	Pulse	0.15	3
Ca			1	10095.995	ug/l	1.01	8,530,526.75	1.328E+00	Analog	0.10	3
Sr			1	0.085	ug/l	10.07	4,314.05	4.760E-04	Pulse	0.10	3
Mo			1	0.021	ug/l	16.23	233.34	2.573E-05	Pulse	0.10	3
Ag			1	0.004	ug/l	61.13	96.67	1.031E-05	Pulse	0.10	3
Sn			1	0.100	ug/l	5.22	2,450.29	2.609E-04	Pulse	0.10	3
Sb			1	0.486	ug/l	2.33	4,450.79	3.066E-04	Pulse	0.10	3
Ba			1	0.022	ug/l	43.85	176.67	1.215E-05	Pulse	0.10	3
Tl			1	0.005	ug/l	32.27	220.01	2.443E-05	Pulse	0.10	3
Pb			1	0.015	ug/l	10.43	463.36	5.145E-05	Pulse	0.10	3
Pb			1	0.008	ug/l	20.81	416.69	4.622E-05	Pulse	0.10	3
Pb			1	0.012	ug/l	10.33	1,960.13	2.175E-04	Pulse	0.10	3
Na			2	10229.096	ug/l	1.11	14,599,916.64	3.669E+01	Analog	0.30	3
Mg			2	10190.081	ug/l	0.58	7,053,730.00	1.773E+01	Analog	0.30	3
Al			2	10031.572	ug/l	0.17	2,337,391.57	5.875E+00	Pulse	0.30	3
K			2	10172.527	ug/l	0.56	5,040,753.13	1.267E+01	Analog	0.30	3
Ca			2	10009.804	ug/l	0.60	266,716.95	6.703E-01	Pulse	0.30	3
Ti			2	0.038	ug/l	22.72	31.11	7.818E-05	Pulse	0.30	3
V			2	0.011	ug/l	18.37	243.34	6.115E-04	Pulse	0.30	3
Cr			2	0.074	ug/l	18.20	1,036.72	2.605E-03	Pulse	0.30	3
Mn			2	0.272	ug/l	1.05	806.70	2.028E-03	Pulse	0.30	3
Fe			2	10035.836	ug/l	1.25	68,854,215.04	1.731E+02	Analog	0.30	3
Co			2	0.415	ug/l	4.30	5,947.54	1.494E-02	Pulse	0.30	3
Ni			2	0.343	ug/l	3.70	1,345.63	3.382E-03	Pulse	0.30	3
Cu			2	-0.088	ug/l	-44.80	15,717.62	3.950E-02	Pulse	0.30	3
Zn			2	0.304	ug/l	8.20	908.93	2.284E-03	Pulse	0.30	3
As			2	0.056	ug/l	14.32	76.33	1.918E-04	Pulse	1.00	3
Cd			2	-0.001	ug/l	-406.32	17.75	7.519E-06	Pulse	0.30	3
Sn			2	0.290	ug/l	5.94	918.93	3.884E-04	Pulse	0.30	3
Se			3	0.083	ug/l	2.67	41.60	6.656E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,199,032.79	0.46	99.8	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		6,422,735.53	0.84	100.2	Analog	0.10	3
1	Ge		1,231,234.49	1.28	99.0	Pulse	0.10	3
1	Ge		1,713,327.48	0.68	98.6	Pulse	0.10	3
1	Rh		9,065,282.36	0.67	93.9	Analog	0.10	3
1	In		9,391,560.72	0.55	95.9	Analog	0.10	3
1	Tb		14,515,110.62	0.82	97.4	Analog	0.10	3
1	Ho		14,695,521.45	1.05	97.8	Analog	0.10	3
1	Bi		9,011,042.37	1.34	92.7	Analog	0.10	3
2	Sc		397,877.87	0.76	100.0	Pulse	0.30	3
2	Ge		238,959.82	1.06	99.5	Pulse	0.30	3
2	Ge		360,869.90	1.27	99.3	Pulse	0.30	3
2	Rh		6,469,089.33	0.57	95.9	Analog	0.30	3
2	In		2,365,069.80	0.90	97.5	Pulse	0.30	3
2	Tb		9,143,235.19	0.65	98.4	Analog	0.30	3
2	Ho		9,304,349.63	0.63	97.6	Analog	0.30	3
2	Bi		6,240,033.36	0.74	94.6	Analog	0.30	3
3	Sc		676,035.83	0.32	98.3	Pulse	0.30	3
3	Ge		416,472.41	0.81	98.3	Pulse	0.30	3
3	Ge		625,049.47	1.26	98.5	Pulse	0.30	3
3	Rh		6,230,264.34	0.52	97.9	Analog	0.30	3
3	Tb		10,944,311.79	0.12	101.6	Analog	0.30	3

Quantitation Report

File Name	014SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 10:46
Sample Name	rinseconf
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.002	ug/l	90.50	46.67	1.453E-05	Pulse	0.25	3
B			1	1.322	ug/l	4.82	8,633.49	2.687E-03	Pulse	0.15	3
Ca			1	0.371	ug/l	90.81	7,865.49	1.250E-03	Pulse	0.10	3
Sr			1	0.001	ug/l	313.04	503.36	5.334E-05	Pulse	0.10	3
Mo			1	0.000	ug/l	672.26	56.67	6.013E-06	Pulse	0.10	3
Ag			1	0.002	ug/l	46.11	63.33	6.583E-06	Pulse	0.10	3
Sn			1	0.035	ug/l	57.65	1,566.82	1.630E-04	Pulse	0.10	3
Sb			1	0.367	ug/l	2.76	2,436.97	1.673E-04	Pulse	0.10	3
Ba			1	0.008	ug/l	87.17	73.33	5.028E-06	Pulse	0.10	3
Tl			1	0.003	ug/l	6.44	160.01	1.692E-05	Pulse	0.10	3
Pb			1	0.005	ug/l	124.22	313.35	3.311E-05	Pulse	0.10	3
Pb			1	0.003	ug/l	148.17	350.02	3.701E-05	Pulse	0.10	3
Pb			1	0.001	ug/l	136.43	1,306.74	1.382E-04	Pulse	0.10	3
Na			2	0.302	ug/l	115.87	11,674.13	2.957E-02	Pulse	0.30	3
Mg			2	0.302	ug/l	23.82	262.23	6.648E-04	Pulse	0.30	3
Al			2	0.323	ug/l	23.82	131.11	3.323E-04	Pulse	0.30	3
K			2	0.128	ug/l	524.70	12,051.12	3.053E-02	Pulse	0.30	3
Ca			2	-1.219	ug/l	-61.75	71.11	1.803E-04	Pulse	0.30	3
Ti			2	0.018	ug/l	252.44	26.67	6.759E-05	Pulse	0.30	3
V			2	0.009	ug/l	21.96	231.12	5.855E-04	Pulse	0.30	3
Cr			2	0.003	ug/l	197.12	405.56	1.027E-03	Pulse	0.30	3
Mn			2	0.126	ug/l	6.07	107.78	2.734E-04	Pulse	0.30	3
Fe			2	0.856	ug/l	7.06	8,531.19	2.161E-02	Pulse	0.30	3
Co			2	0.001	ug/l	194.21	53.31	1.349E-04	Pulse	0.30	3
Ni			2	0.002	ug/l	150.39	46.67	1.183E-04	Pulse	0.30	3
Cu			2	0.157	ug/l	16.89	18,134.58	4.594E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	-0.157	ug/l	-8.61	164.45	4.165E-04	Pulse	0.30	3
As			2	0.013	ug/l	48.27	41.33	1.047E-04	Pulse	1.00	3
Cd			2	0.005	ug/l	60.37	31.10	1.288E-05	Pulse	0.30	3
Sn			2	0.221	ug/l	3.80	600.02	2.488E-04	Pulse	0.30	3
Se			3	0.056	ug/l	13.32	34.87	5.555E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,212,691.05	0.65	100.2	Pulse	0.10	3
1	Sc		6,293,493.24	0.43	98.1	Analog	0.10	3
1	Ge		1,227,199.64	1.79	98.6	Pulse	0.10	3
1	Ge		1,708,290.23	0.91	98.3	Pulse	0.10	3
1	Rh		9,429,305.48	0.72	97.7	Analog	0.10	3
1	In		9,611,874.59	0.51	98.1	Analog	0.10	3
1	Tb		14,565,541.03	0.65	97.8	Analog	0.10	3
1	Ho		14,920,436.44	1.19	99.3	Analog	0.10	3
1	Bi		9,455,876.11	0.35	97.2	Analog	0.10	3
2	Sc		394,760.33	0.59	99.3	Pulse	0.30	3
2	Ge		238,986.30	0.30	99.5	Pulse	0.30	3
2	Ge		361,431.69	0.93	99.5	Pulse	0.30	3
2	Rh		6,687,295.98	0.22	99.1	Analog	0.30	3
2	In		2,411,021.21	0.70	99.4	Pulse	0.30	3
2	Tb		9,227,420.19	0.65	99.3	Analog	0.30	3
2	Ho		9,380,507.40	1.27	98.4	Analog	0.30	3
2	Bi		6,560,300.85	0.31	99.4	Analog	0.30	3
3	Sc		670,454.82	1.08	97.5	Pulse	0.30	3
3	Ge		415,948.97	1.02	98.1	Pulse	0.30	3
3	Ge		627,791.26	0.63	98.9	Pulse	0.30	3
3	Rh		6,431,347.38	1.35	101.1	Analog	0.30	3
3	Tb		10,971,627.90	0.72	101.8	Analog	0.30	3

Quantitation Report

File Name	015SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 10:51
Sample Name	ICVA
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	59.449	ug/l	1.80	406,955.79	1.265E-01	Pulse	0.25	3
B			1	123.508	ug/l	1.12	608,680.43	1.892E-01	Pulse	0.15	3
Ca			1	5612.188	ug/l	1.56	4,610,170.56	7.389E-01	Pulse	0.10	3
Sr			1	56.519	ug/l	1.43	2,600,330.53	2.828E-01	Pulse	0.10	3
Mo			1	59.099	ug/l	2.45	508,908.84	5.536E-02	Pulse	0.10	3
Ag			1	63.301	ug/l	2.63	1,396,263.10	1.492E-01	Pulse	0.10	3
Sn			1	59.036	ug/l	2.39	826,941.44	8.835E-02	Pulse	0.10	3
Sb			1	65.084	ug/l	1.68	1,102,994.98	7.619E-02	Pulse	0.10	3
Ba			1	60.794	ug/l	2.06	433,598.13	2.995E-02	Pulse	0.10	3
Tl			1	62.009	ug/l	2.17	3,056,278.70	3.340E-01	Pulse	0.10	3
Pb			1	61.779	ug/l	2.22	1,040,924.54	1.138E-01	Pulse	0.10	3
Pb			1	58.902	ug/l	2.95	871,315.01	9.523E-02	Pulse	0.10	3
Pb			1	60.254	ug/l	2.07	4,086,439.36	4.466E-01	Pulse	0.10	3
Na			2	5569.739	ug/l	0.59	7,933,553.02	1.999E+01	Analog	0.30	3
Mg			2	5442.989	ug/l	0.68	3,757,684.85	9.470E+00	Pulse	0.30	3
Al			2	5892.928	ug/l	0.67	1,369,407.55	3.451E+00	Pulse	0.30	3
K			2	5427.957	ug/l	0.35	2,688,186.15	6.774E+00	Pulse	0.30	3
Ca			2	5812.083	ug/l	0.98	154,498.84	3.893E-01	Pulse	0.30	3
Ti			2	58.606	ug/l	2.95	11,841.02	2.984E-02	Pulse	0.30	3
V			2	60.550	ug/l	0.72	411,999.16	1.038E+00	Pulse	0.30	3
Cr			2	59.069	ug/l	0.74	522,469.75	1.317E+00	Pulse	0.30	3
Mn			2	59.930	ug/l	0.77	284,958.95	7.181E-01	Pulse	0.30	3
Fe			2	5476.501	ug/l	0.61	37,475,764.07	9.444E+01	Analog	0.30	3
Co			2	58.529	ug/l	0.42	830,578.70	2.093E+00	Pulse	0.30	3
Ni			2	57.907	ug/l	0.90	220,289.36	5.551E-01	Pulse	0.30	3
Cu			2	58.214	ug/l	0.29	622,849.30	1.570E+00	Pulse	0.30	3
Zn			2	58.532	ug/l	0.90	94,534.63	2.382E-01	Pulse	0.30	3
As			2	64.334	ug/l	1.82	52,608.80	1.326E-01	Pulse	1.00	3
Cd			2	58.448	ug/l	1.20	145,848.20	5.977E-02	Pulse	0.30	3
Sn			2	58.248	ug/l	0.50	285,795.90	1.171E-01	Pulse	0.30	3
Se			3	281.688	ug/l	0.72	72,444.89	1.148E-01	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,217,720.48	0.68	100.4	Pulse	0.10	3
1	Sc		6,240,019.28	1.03	97.3	Analog	0.10	3
1	Ge		1,248,813.03	0.94	100.4	Pulse	0.10	3

Quantitation Report

1	Ge		1,746,175.91	1.23	100.5	Pulse	0.10	3
1	Rh		9,194,126.53	1.26	95.3	Analog	0.10	3
1	In		9,361,634.02	1.49	95.6	Analog	0.10	3
1	Tb		14,477,986.45	1.03	97.2	Analog	0.10	3
1	Ho		14,755,961.86	1.31	98.2	Analog	0.10	3
1	Bi		9,149,448.40	0.68	94.1	Analog	0.10	3
2	Sc		396,818.94	0.62	99.8	Pulse	0.30	3
2	Ge		243,093.92	0.93	101.2	Pulse	0.30	3
2	Ge		367,280.84	1.23	101.1	Pulse	0.30	3
2	Rh		6,467,880.99	0.71	95.9	Analog	0.30	3
2	In		2,440,058.03	0.67	100.6	Pulse	0.30	3
2	Tb		9,108,393.80	0.60	98.0	Analog	0.30	3
2	Ho		9,281,276.30	0.73	97.3	Analog	0.30	3
2	Bi		6,265,944.33	1.40	95.0	Analog	0.30	3
3	Sc		678,336.88	0.58	98.6	Pulse	0.30	3
3	Ge		419,497.52	0.96	99.0	Pulse	0.30	3
3	Ge		631,241.43	0.86	99.5	Pulse	0.30	3
3	Rh		6,221,591.98	0.29	97.8	Analog	0.30	3
3	Tb		10,954,539.01	1.29	101.7	Analog	0.30	3

Quantitation Report

File Name	016SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 10:56
Sample Name	ICV
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.003	ug/l	119.49	53.33	1.673E-05	Pulse	0.25	3
B			1	3.404	ug/l	2.46	18,703.94	5.864E-03	Pulse	0.15	3
Ca			1	1.585	ug/l	14.55	8,782.66	1.409E-03	Pulse	0.10	3
Sr			1	0.006	ug/l	20.63	753.38	8.039E-05	Pulse	0.10	3
Mo			1	0.141	ug/l	1.73	1,290.11	1.377E-04	Pulse	0.10	3
Ag			1	0.008	ug/l	29.12	190.01	1.967E-05	Pulse	0.10	3
Sn			1	0.183	ug/l	13.53	3,723.91	3.852E-04	Pulse	0.10	3
Sb			1	0.357	ug/l	3.58	2,253.58	1.551E-04	Pulse	0.10	3
Ba			1	0.013	ug/l	53.57	113.34	7.785E-06	Pulse	0.10	3
Tl			1	0.012	ug/l	14.53	586.70	6.242E-05	Pulse	0.10	3
Pb			1	0.022	ug/l	9.32	606.70	6.457E-05	Pulse	0.10	3
Pb			1	0.017	ug/l	21.35	560.03	5.960E-05	Pulse	0.10	3
Pb			1	0.015	ug/l	13.32	2,276.82	2.423E-04	Pulse	0.10	3
Na			2	2.397	ug/l	17.24	14,326.28	3.709E-02	Pulse	0.30	3
Mg			2	0.519	ug/l	15.56	402.23	1.042E-03	Pulse	0.30	3
Al			2	63.372	ug/l	0.98	14,389.61	3.725E-02	Pulse	0.30	3
K			2	-0.070	ug/l	-762.74	11,696.42	3.028E-02	Pulse	0.30	3
Ca			2	-0.386	ug/l	-257.39	91.11	2.360E-04	Pulse	0.30	3
Ti			2	0.060	ug/l	142.52	34.45	8.915E-05	Pulse	0.30	3
V			2	-0.001	ug/l	-152.77	157.78	4.084E-04	Pulse	0.30	3
Cr			2	0.067	ug/l	12.72	950.04	2.460E-03	Pulse	0.30	3
Mn			2	0.123	ug/l	3.90	94.45	2.444E-04	Pulse	0.30	3
Fe			2	2.117	ug/l	4.97	16,746.42	4.335E-02	Pulse	0.30	3
Co			2	0.000	ug/l	116.35	47.73	1.236E-04	Pulse	0.30	3
Ni			2	0.014	ug/l	21.42	90.00	2.329E-04	Pulse	0.30	3
Cu			2	-0.193	ug/l	-4.47	14,192.90	3.674E-02	Pulse	0.30	3
Zn			2	0.018	ug/l	82.44	434.45	1.125E-03	Pulse	0.30	3
As			2	0.010	ug/l	166.10	37.67	9.743E-05	Pulse	1.00	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Cd			2	-0.001	ug/l	-248.49	17.65	7.390E-06	Pulse	0.30	3
Sn			2	0.398	ug/l	7.04	1,448.98	6.058E-04	Pulse	0.30	3
Se			3	0.129	ug/l	18.03	52.80	8.540E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,189,438.92	0.38	99.5	Pulse	0.10	3
1	Sc		6,231,757.82	0.58	97.2	Analog	0.10	3
1	Ge		1,227,759.80	1.07	98.7	Pulse	0.10	3
1	Ge		1,714,655.60	1.63	98.6	Pulse	0.10	3
1	Rh		9,368,104.03	1.24	97.1	Analog	0.10	3
1	In		9,668,210.25	0.88	98.7	Analog	0.10	3
1	Tb		14,530,236.03	0.76	97.5	Analog	0.10	3
1	Ho		14,635,718.53	0.46	97.4	Analog	0.10	3
1	Bi		9,397,428.82	0.39	96.6	Analog	0.10	3
2	Sc		386,263.96	0.38	97.1	Pulse	0.30	3
2	Ge		236,990.11	0.83	98.7	Pulse	0.30	3
2	Ge		357,056.70	0.87	98.3	Pulse	0.30	3
2	Rh		6,615,275.29	0.43	98.1	Analog	0.30	3
2	In		2,390,539.32	1.24	98.5	Pulse	0.30	3
2	Tb		9,136,206.30	1.15	98.3	Analog	0.30	3
2	Ho		9,349,747.40	0.29	98.1	Analog	0.30	3
2	Bi		6,503,538.77	1.00	98.6	Analog	0.30	3
3	Sc		656,435.81	1.58	95.4	Pulse	0.30	3
3	Ge		409,066.22	0.79	96.5	Pulse	0.30	3
3	Ge		618,666.71	0.92	97.5	Pulse	0.30	3
3	Rh		6,417,180.86	0.22	100.8	Analog	0.30	3
3	Tb		10,909,883.73	1.11	101.3	Analog	0.30	3

Quantitation Report

File Name	017_CCB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 11:01
Sample Name	ICB
Sample Type	CCB
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.002	ug/l	46.76	46.67	1.467E-05	Pulse	0.25	3
B			1	1.947	ug/l	5.90	11,586.41	3.641E-03	Pulse	0.15	3
Ca			1	-0.113	ug/l	-253.57	7,438.60	1.186E-03	Pulse	0.10	3
Sr			1	0.001	ug/l	67.33	543.36	5.719E-05	Pulse	0.10	3
Mo			1	0.028	ug/l	24.44	303.35	3.193E-05	Pulse	0.10	3
Ag			1	0.003	ug/l	53.56	90.00	9.313E-06	Pulse	0.10	3
Sn			1	0.061	ug/l	18.28	1,953.53	2.015E-04	Pulse	0.10	3
Sb			1	0.333	ug/l	4.12	1,856.85	1.278E-04	Pulse	0.10	3
Ba			1	0.010	ug/l	37.48	90.00	6.197E-06	Pulse	0.10	3
Tl			1	0.005	ug/l	14.61	256.68	2.732E-05	Pulse	0.10	3
Pb			1	0.009	ug/l	45.76	370.02	3.939E-05	Pulse	0.10	3
Pb			1	-0.002	ug/l	-183.43	270.01	2.879E-05	Pulse	0.10	3
Pb			1	0.002	ug/l	101.53	1,363.40	1.452E-04	Pulse	0.10	3
Na			2	-0.098	ug/l	-122.51	11,000.34	2.814E-02	Pulse	0.30	3
Mg			2	0.146	ug/l	33.57	153.33	3.926E-04	Pulse	0.30	3
Al			2	0.144	ug/l	40.43	88.89	2.272E-04	Pulse	0.30	3
K			2	-1.231	ug/l	-33.82	11,273.90	2.884E-02	Pulse	0.30	3
Ca			2	0.381	ug/l	393.77	112.22	2.874E-04	Pulse	0.30	3
Ti			2	0.047	ug/l	112.46	32.22	8.260E-05	Pulse	0.30	3
V			2	0.004	ug/l	41.42	195.56	5.004E-04	Pulse	0.30	3
Cr			2	0.001	ug/l	265.23	385.57	9.858E-04	Pulse	0.30	3
Mn			2	0.127	ug/l	1.61	114.45	2.929E-04	Pulse	0.30	3
Fe			2	0.668	ug/l	9.30	7,178.33	1.836E-02	Pulse	0.30	3
Co			2	0.002	ug/l	19.04	77.76	1.988E-04	Pulse	0.30	3
Ni			2	0.004	ug/l	68.87	54.45	1.394E-04	Pulse	0.30	3
Cu			2	-0.086	ug/l	-32.69	15,461.86	3.955E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	-0.132	ug/l	-7.06	203.34	5.200E-04	Pulse	0.30	3
As			2	0.021	ug/l	46.42	46.67	1.195E-04	Pulse	1.00	3
Cd			2	0.005	ug/l	106.89	32.19	1.344E-05	Pulse	0.30	3
Sn			2	0.257	ug/l	2.01	767.80	3.209E-04	Pulse	0.30	3
Se			3	0.107	ug/l	5.19	47.20	7.629E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,182,988.68	0.96	99.3	Pulse	0.10	3
1	Sc		6,270,718.24	0.39	97.8	Analog	0.10	3
1	Ge		1,219,669.23	0.98	98.0	Pulse	0.10	3
1	Ge		1,702,070.55	1.72	97.9	Pulse	0.10	3
1	Rh		9,499,889.44	0.90	98.4	Analog	0.10	3
1	In		9,691,389.76	0.95	98.9	Analog	0.10	3
1	Tb		14,527,784.78	0.37	97.5	Analog	0.10	3
1	Ho		14,700,607.28	0.46	97.8	Analog	0.10	3
1	Bi		9,394,493.40	0.98	96.6	Analog	0.10	3
2	Sc		390,960.69	1.23	98.3	Pulse	0.30	3
2	Ge		239,114.73	0.87	99.6	Pulse	0.30	3
2	Ge		358,189.99	0.55	98.6	Pulse	0.30	3
2	Rh		6,713,652.09	1.46	99.5	Analog	0.30	3
2	In		2,393,220.86	1.71	98.6	Pulse	0.30	3
2	Tb		9,147,394.64	0.98	98.5	Analog	0.30	3
2	Ho		9,336,398.79	0.80	97.9	Analog	0.30	3
2	Bi		6,499,146.55	0.14	98.5	Analog	0.30	3
3	Sc		658,557.65	0.21	95.8	Pulse	0.30	3
3	Ge		409,801.36	0.62	96.7	Pulse	0.30	3
3	Ge		618,739.47	0.41	97.5	Pulse	0.30	3
3	Rh		6,417,969.33	1.19	100.9	Analog	0.30	3
3	Tb		10,952,343.18	0.81	101.7	Analog	0.30	3

Quantitation Report

File Name	018_CCV.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 11:06
Sample Name	CCVA
Sample Type	CCV
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	49.978	ug/l	0.98	336,868.95	1.063E-01	Pulse	0.25	3
B			1	105.953	ug/l	1.95	514,448.49	1.624E-01	Pulse	0.15	3
Ca			1	5033.547	ug/l	2.42	4,163,469.00	6.628E-01	Pulse	0.10	3
Sr			1	50.900	ug/l	1.69	2,327,427.67	2.547E-01	Pulse	0.10	3
Mo			1	50.593	ug/l	0.77	433,008.45	4.739E-02	Pulse	0.10	3
Ag			1	50.651	ug/l	2.47	1,116,351.91	1.194E-01	Pulse	0.10	3
Sn			1	50.122	ug/l	1.35	701,722.00	7.503E-02	Pulse	0.10	3
Sb			1	50.648	ug/l	1.09	861,201.00	5.923E-02	Pulse	0.10	3
Ba			1	49.440	ug/l	0.75	354,138.37	2.436E-02	Pulse	0.10	3
Tl			1	49.258	ug/l	1.51	2,426,444.71	2.653E-01	Pulse	0.10	3
Pb			1	50.133	ug/l	1.64	844,329.02	9.233E-02	Pulse	0.10	3
Pb			1	50.005	ug/l	1.30	739,337.02	8.085E-02	Pulse	0.10	3
Pb			1	49.897	ug/l	1.57	3,382,531.01	3.699E-01	Pulse	0.10	3
Na			2	4979.861	ug/l	0.90	7,155,414.71	1.788E+01	Analog	0.30	3
Mg			2	4826.304	ug/l	1.12	3,360,524.94	8.397E+00	Pulse	0.30	3
Al			2	4945.188	ug/l	1.17	1,159,031.34	2.896E+00	Pulse	0.30	3
K			2	4894.329	ug/l	1.14	2,445,856.43	6.111E+00	Pulse	0.30	3
Ca			2	5120.910	ug/l	1.17	137,299.80	3.431E-01	Pulse	0.30	3
Ti			2	48.780	ug/l	1.00	9,945.27	2.485E-02	Pulse	0.30	3
V			2	48.841	ug/l	0.73	335,221.80	8.376E-01	Pulse	0.30	3
Cr			2	48.295	ug/l	0.78	430,910.39	1.077E+00	Pulse	0.30	3
Mn			2	48.375	ug/l	0.77	231,901.82	5.794E-01	Pulse	0.30	3
Fe			2	4885.800	ug/l	0.70	33,722,957.55	8.426E+01	Analog	0.30	3
Co			2	48.026	ug/l	1.75	687,351.56	1.718E+00	Pulse	0.30	3
Ni			2	47.774	ug/l	1.56	183,295.49	4.580E-01	Pulse	0.30	3
Cu			2	47.651	ug/l	0.84	517,238.82	1.292E+00	Pulse	0.30	3
Zn			2	47.172	ug/l	1.20	76,921.58	1.922E-01	Pulse	0.30	3
As			2	48.965	ug/l	1.16	40,391.65	1.009E-01	Pulse	1.00	3
Cd			2	48.437	ug/l	0.28	120,468.54	4.954E-02	Pulse	0.30	3
Sn			2	49.440	ug/l	1.01	241,683.93	9.939E-02	Pulse	0.30	3
Se			3	202.688	ug/l	0.62	51,951.56	8.259E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,168,167.68	0.69	98.9	Pulse	0.10	3
1	Sc		6,281,641.78	0.36	98.0	Analog	0.10	3
1	Ge		1,233,930.27	1.30	99.2	Pulse	0.10	3

Quantitation Report

1	Ge		1,732,085.29	2.02	99.6	Pulse	0.10	3
1	Rh		9,137,079.24	0.99	94.7	Analog	0.10	3
1	In		9,352,910.52	1.05	95.5	Analog	0.10	3
1	Tb		14,539,242.70	0.72	97.6	Analog	0.10	3
1	Ho		14,743,041.45	0.39	98.1	Analog	0.10	3
1	Bi		9,143,983.20	0.94	94.0	Analog	0.10	3
2	Sc		400,230.85	0.66	100.6	Pulse	0.30	3
2	Ge		243,485.01	0.31	101.4	Pulse	0.30	3
2	Ge		367,029.83	0.49	101.0	Pulse	0.30	3
2	Rh		6,571,731.68	1.11	97.4	Analog	0.30	3
2	In		2,431,870.59	1.04	100.2	Pulse	0.30	3
2	Tb		9,174,575.75	1.69	98.7	Analog	0.30	3
2	Ho		9,348,649.35	1.48	98.0	Analog	0.30	3
2	Bi		6,292,670.86	1.10	95.4	Analog	0.30	3
3	Sc		667,217.82	0.79	97.0	Pulse	0.30	3
3	Ge		415,760.23	0.43	98.1	Pulse	0.30	3
3	Ge		629,021.61	0.32	99.1	Pulse	0.30	3
3	Rh		6,247,854.75	1.34	98.2	Analog	0.30	3
3	Tb		10,979,259.84	1.28	101.9	Analog	0.30	3

Quantitation Report

File Name	019_CCB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 11:11
Sample Name	CCB
Sample Type	CCB
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.004	ug/l	17.45	58.67	1.846E-05	Pulse	0.25	3
B			1	3.420	ug/l	0.87	18,717.26	5.890E-03	Pulse	0.15	3
Ca			1	-0.171	ug/l	-149.56	7,458.67	1.179E-03	Pulse	0.10	3
Sr			1	0.002	ug/l	134.75	576.70	6.031E-05	Pulse	0.10	3
Mo			1	0.143	ug/l	4.21	1,330.10	1.395E-04	Pulse	0.10	3
Ag			1	0.008	ug/l	22.79	193.34	1.986E-05	Pulse	0.10	3
Sn			1	0.193	ug/l	20.84	3,890.63	3.996E-04	Pulse	0.10	3
Sb			1	0.587	ug/l	2.66	6,248.12	4.253E-04	Pulse	0.10	3
Ba			1	0.005	ug/l	61.62	56.67	3.856E-06	Pulse	0.10	3
Tl			1	0.013	ug/l	15.32	676.71	7.149E-05	Pulse	0.10	3
Pb			1	0.018	ug/l	27.75	536.70	5.669E-05	Pulse	0.10	3
Pb			1	0.006	ug/l	16.34	400.02	4.227E-05	Pulse	0.10	3
Pb			1	0.011	ug/l	13.96	2,006.81	2.121E-04	Pulse	0.10	3
Na			2	0.190	ug/l	57.77	11,668.54	2.917E-02	Pulse	0.30	3
Mg			2	0.326	ug/l	8.68	282.23	7.057E-04	Pulse	0.30	3
Al			2	0.444	ug/l	6.37	161.11	4.029E-04	Pulse	0.30	3
K			2	-0.672	ug/l	-85.13	11,813.20	2.953E-02	Pulse	0.30	3
Ca			2	-0.593	ug/l	-12.99	88.89	2.222E-04	Pulse	0.30	3
Ti			2	0.081	ug/l	51.07	40.00	9.986E-05	Pulse	0.30	3
V			2	0.005	ug/l	93.43	204.45	5.115E-04	Pulse	0.30	3
Cr			2	0.004	ug/l	117.99	418.90	1.048E-03	Pulse	0.30	3
Mn			2	0.133	ug/l	2.59	145.56	3.639E-04	Pulse	0.30	3
Fe			2	1.490	ug/l	9.89	13,006.70	3.253E-02	Pulse	0.30	3
Co			2	0.003	ug/l	52.69	91.07	2.276E-04	Pulse	0.30	3
Ni			2	0.006	ug/l	141.08	61.11	1.523E-04	Pulse	0.30	3
Cu			2	-0.224	ug/l	-7.02	14,377.53	3.594E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	-0.146	ug/l	-17.66	184.45	4.616E-04	Pulse	0.30	3
As			2	0.032	ug/l	2.89	57.33	1.433E-04	Pulse	1.00	3
Cd			2	0.011	ug/l	82.93	46.49	1.911E-05	Pulse	0.30	3
Sn			2	0.470	ug/l	4.65	1,825.69	7.507E-04	Pulse	0.30	3
Se			3	0.191	ug/l	9.93	69.53	1.104E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,177,879.74	0.26	99.2	Pulse	0.10	3
1	Sc		6,329,626.36	0.76	98.7	Analog	0.10	3
1	Ge		1,232,388.08	0.90	99.1	Pulse	0.10	3
1	Ge		1,730,763.10	1.07	99.6	Pulse	0.10	3
1	Rh		9,541,178.82	2.00	98.8	Analog	0.10	3
1	In		9,738,039.65	0.73	99.4	Analog	0.10	3
1	Tb		14,690,784.36	0.69	98.6	Analog	0.10	3
1	Ho		14,895,603.11	0.97	99.1	Analog	0.10	3
1	Bi		9,463,249.44	1.12	97.3	Analog	0.10	3
2	Sc		400,019.22	0.97	100.6	Pulse	0.30	3
2	Ge		243,097.85	0.16	101.2	Pulse	0.30	3
2	Ge		366,860.60	1.25	101.0	Pulse	0.30	3
2	Rh		6,786,307.09	0.58	100.6	Analog	0.30	3
2	In		2,432,050.07	0.46	100.2	Pulse	0.30	3
2	Tb		9,320,918.52	0.50	100.3	Analog	0.30	3
2	Ho		9,466,999.07	1.14	99.3	Analog	0.30	3
2	Bi		6,587,609.60	0.81	99.8	Analog	0.30	3
3	Sc		671,342.13	0.47	97.6	Pulse	0.30	3
3	Ge		416,584.33	0.55	98.3	Pulse	0.30	3
3	Ge		629,522.23	0.36	99.2	Pulse	0.30	3
3	Rh		6,456,218.63	0.60	101.5	Analog	0.30	3
3	Tb		10,987,867.06	0.47	102.0	Analog	0.30	3

Quantitation Report

File Name	020LCCV.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 11:16
Sample Name	CRI
Sample Type	LLCCV
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.424	ug/l	3.36	2,946.96	9.122E-04	Pulse	0.25	3
B			1	25.025	ug/l	1.30	125,551.90	3.886E-02	Pulse	0.15	3
Ca			1	242.625	ug/l	1.19	211,565.20	3.309E-02	Pulse	0.10	3
Sr			1	4.298	ug/l	1.06	206,437.27	2.156E-02	Pulse	0.10	3
Mo			1	0.931	ug/l	2.37	8,409.19	8.781E-04	Pulse	0.10	3
Ag			1	0.453	ug/l	3.93	10,413.81	1.068E-03	Pulse	0.10	3
Sn			1	4.561	ug/l	1.19	67,541.88	6.929E-03	Pulse	0.10	3
Sb			1	2.212	ug/l	2.94	34,275.00	2.335E-03	Pulse	0.10	3
Ba			1	0.902	ug/l	4.39	6,548.32	4.458E-04	Pulse	0.10	3
Tl			1	0.422	ug/l	2.30	21,556.44	2.271E-03	Pulse	0.10	3
Pb			1	0.449	ug/l	8.04	8,059.19	8.495E-04	Pulse	0.10	3
Pb			1	0.448	ug/l	7.18	7,185.37	7.568E-04	Pulse	0.10	3
Pb			1	0.448	ug/l	2.49	32,758.87	3.452E-03	Pulse	0.10	3
Na			2	236.481	ug/l	0.36	352,870.24	8.762E-01	Pulse	0.30	3
Mg			2	237.822	ug/l	0.76	166,695.03	4.139E-01	Pulse	0.30	3
Al			2	25.450	ug/l	1.92	6,060.05	1.505E-02	Pulse	0.30	3
K			2	239.003	ug/l	0.42	131,827.20	3.273E-01	Pulse	0.30	3
Ca			2	262.296	ug/l	3.12	7,177.19	1.782E-02	Pulse	0.30	3
Ti			2	1.013	ug/l	29.44	231.12	5.736E-04	Pulse	0.30	3
V			2	0.885	ug/l	1.89	6,279.04	1.559E-02	Pulse	0.30	3
Cr			2	0.892	ug/l	3.38	8,386.67	2.082E-02	Pulse	0.30	3
Mn			2	1.018	ug/l	3.20	4,422.87	1.098E-02	Pulse	0.30	3
Fe			2	24.553	ug/l	1.37	173,273.38	4.302E-01	Pulse	0.30	3
Co			2	0.443	ug/l	1.84	6,429.75	1.596E-02	Pulse	0.30	3
Ni			2	0.876	ug/l	3.55	3,421.51	8.495E-03	Pulse	0.30	3
Cu			2	1.567	ug/l	2.03	33,403.90	8.294E-02	Pulse	0.30	3
Zn			2	4.292	ug/l	1.95	7,429.55	1.845E-02	Pulse	0.30	3
As			2	0.481	ug/l	5.74	430.34	1.069E-03	Pulse	1.00	3
Cd			2	0.475	ug/l	5.03	1,214.84	4.940E-04	Pulse	0.30	3
Sn			2	4.754	ug/l	1.47	23,062.54	9.380E-03	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	0.589	ug/l	2.49	171.73	2.726E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,230,577.75	0.20	100.8	Pulse	0.10	3
1	Sc		6,393,508.45	0.70	99.7	Analog	0.10	3
1	Ge		1,254,140.87	0.92	100.8	Pulse	0.10	3
1	Ge		1,753,757.32	0.47	100.9	Pulse	0.10	3
1	Rh		9,576,786.94	0.39	99.2	Analog	0.10	3
1	In		9,748,296.19	0.33	99.5	Analog	0.10	3
1	Tb		14,684,029.36	1.32	98.5	Analog	0.10	3
1	Ho		14,847,097.28	0.63	98.8	Analog	0.10	3
1	Bi		9,492,088.81	1.18	97.6	Analog	0.10	3
2	Sc		402,747.27	0.25	101.3	Pulse	0.30	3
2	Ge		244,652.31	0.43	101.9	Pulse	0.30	3
2	Ge		369,235.82	0.78	101.7	Pulse	0.30	3
2	Rh		6,812,729.45	0.34	101.0	Analog	0.30	3
2	In		2,458,891.83	0.61	101.3	Pulse	0.30	3
2	Tb		9,253,831.30	1.72	99.6	Analog	0.30	3
2	Ho		9,529,896.29	0.48	99.9	Analog	0.30	3
2	Bi		6,590,039.18	0.41	99.9	Analog	0.30	3
3	Sc		673,785.29	0.41	98.0	Pulse	0.30	3
3	Ge		418,556.48	0.29	98.7	Pulse	0.30	3
3	Ge		629,867.08	0.59	99.3	Pulse	0.30	3
3	Rh		6,467,542.94	0.56	101.6	Analog	0.30	3
3	Tb		11,034,490.67	1.51	102.4	Analog	0.30	3

Quantitation Report

File Name	021ICSA.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 11:22
Sample Name	ICSA
Sample Type	ICSA
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.003	ug/l	84.05	52.00	1.701E-05	Pulse	0.25	3
B			1	2.323	ug/l	2.28	12,871.80	4.215E-03	Pulse	0.15	3
Ca			1	96461.869	ug/l	0.36	79,907,035.48	1.268E+01	Analog	0.10	3
Sr			1	2012.627	ug/l	0.57	83,832,980.42	1.007E+01	Analog	0.10	3
Mo			1	2106.224	ug/l	1.71	16,420,471.84	1.973E+00	Analog	0.10	3
Ag			1	0.022	ug/l	15.86	460.03	5.306E-05	Pulse	0.10	3
Sn			1	1974.339	ug/l	0.71	25,588,433.79	2.951E+00	Analog	0.10	3
Sb			1	0.560	ug/l	4.58	5,544.52	3.936E-04	Pulse	0.10	3
Ba			1	0.178	ug/l	7.46	1,256.77	8.923E-05	Pulse	0.10	3
Tl			1	0.008	ug/l	15.76	366.68	4.437E-05	Pulse	0.10	3
Pb			1	0.078	ug/l	12.25	1,383.46	1.673E-04	Pulse	0.10	3
Pb			1	0.070	ug/l	6.34	1,206.77	1.461E-04	Pulse	0.10	3
Pb			1	0.078	ug/l	6.98	5,867.41	7.102E-04	Pulse	0.10	3
Na			2	95817.167	ug/l	0.89	137,411,803.43	3.435E+02	Analog	0.30	3
Mg			2	94159.107	ug/l	0.24	65,533,624.06	1.638E+02	Analog	0.30	3
Al			2	98199.390	ug/l	0.56	23,004,645.75	5.751E+01	Analog	0.30	3
K			2	97657.547	ug/l	1.39	48,548,082.52	1.214E+02	Analog	0.30	3
Ca			2	102301.529	ug/l	0.64	2,739,809.13	6.848E+00	Pulse	0.30	3
Ti			2	1825.031	ug/l	0.47	371,066.32	9.276E-01	Pulse	0.30	3
V			2	0.030	ug/l	19.04	377.79	9.449E-04	Pulse	0.30	3
Cr			2	1.018	ug/l	1.97	9,453.91	2.363E-02	Pulse	0.30	3
Mn			2	0.596	ug/l	2.33	2,369.09	5.922E-03	Pulse	0.30	3
Fe			2	89972.194	ug/l	0.86	620,635,815.34	1.551E+03	Analog	0.30	3
Co			2	0.185	ug/l	4.28	2,691.59	6.728E-03	Pulse	0.30	3
Ni			2	0.938	ug/l	0.86	3,636.00	9.089E-03	Pulse	0.30	3
Cu			2	-0.881	ug/l	-1.79	7,475.12	1.869E-02	Pulse	0.30	3
Zn			2	0.405	ug/l	16.19	1,077.83	2.693E-03	Pulse	0.30	3
As			2	0.059	ug/l	9.86	79.33	1.983E-04	Pulse	1.00	3
Cd			2	-0.264	ug/l	-6.27	-568.11	-2.621E-04	Pulse	0.30	3
Sn			2	2034.874	ug/l	0.55	8,882,845.48	4.098E+00	Analog	0.30	3
Se			3	0.184	ug/l	10.09	63.33	1.077E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,054,196.73	0.58	95.3	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		6,301,497.41	0.89	98.3	Analog	0.10	3
1	Ge		1,162,122.82	0.99	93.4	Pulse	0.10	3
1	Ge		1,607,142.43	0.95	92.5	Pulse	0.10	3
1	Rh		8,325,157.79	1.58	86.2	Analog	0.10	3
1	In		8,671,289.32	1.48	88.5	Analog	0.10	3
1	Tb		14,084,699.79	0.27	94.5	Analog	0.10	3
1	Ho		14,309,033.12	0.81	95.2	Analog	0.10	3
1	Bi		8,262,757.59	1.20	85.0	Analog	0.10	3
2	Sc		400,048.53	1.04	100.6	Pulse	0.30	3
2	Ge		233,290.23	1.14	97.1	Pulse	0.30	3
2	Ge		346,438.42	0.82	95.4	Pulse	0.30	3
2	Rh		5,917,463.79	0.71	87.7	Analog	0.30	3
2	In		2,167,482.40	1.39	89.3	Pulse	0.30	3
2	Tb		8,846,831.31	0.21	95.2	Analog	0.30	3
2	Ho		8,958,238.81	0.43	94.0	Analog	0.30	3
2	Bi		5,413,083.12	3.61	82.0	Mix	0.30	3
3	Sc		671,507.61	0.48	97.6	Pulse	0.30	3
3	Ge		397,406.96	0.78	93.8	Pulse	0.30	3
3	Ge		588,032.98	0.36	92.7	Pulse	0.30	3
3	Rh		5,520,490.89	1.29	86.8	Analog	0.30	3
3	Tb		10,301,310.98	0.22	95.6	Analog	0.30	3

Quantitation Report

File Name	022ICSB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 11:27
Sample Name	ICSAB
Sample Type	ICSB
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.003	ug/l	86.72	52.00	1.749E-05	Pulse	0.25	3
B			1	54.307	ug/l	2.04	248,688.11	8.355E-02	Pulse	0.15	3
Ca			1	100405.233	ug/l	0.94	82,211,078.77	1.320E+01	Analog	0.10	3
Sr			1	1855.641	ug/l	1.31	77,361,925.52	9.285E+00	Analog	0.10	3
Mo			1	2175.599	ug/l	0.43	16,977,651.83	2.038E+00	Analog	0.10	3
Ag			1	19.500	ug/l	0.38	398,079.85	4.595E-02	Pulse	0.10	3
Sn			1	1944.647	ug/l	0.90	25,177,978.79	2.907E+00	Analog	0.10	3
Sb			1	0.533	ug/l	1.38	5,067.66	3.622E-04	Pulse	0.10	3
Ba			1	0.243	ug/l	11.40	1,693.48	1.210E-04	Pulse	0.10	3
Tl			1	0.005	ug/l	28.77	223.35	2.730E-05	Pulse	0.10	3
Pb			1	0.126	ug/l	8.84	2,090.23	2.559E-04	Pulse	0.10	3
Pb			1	0.107	ug/l	3.57	1,680.16	2.058E-04	Pulse	0.10	3
Pb			1	0.118	ug/l	2.52	8,164.56	9.995E-04	Pulse	0.10	3
Na			2	97006.179	ug/l	1.10	139,503,216.68	3.477E+02	Analog	0.30	3
Mg			2	94983.324	ug/l	0.31	66,297,841.81	1.653E+02	Analog	0.30	3
Al			2	99871.752	ug/l	0.42	23,463,269.07	5.849E+01	Analog	0.30	3
K			2	99043.067	ug/l	0.87	49,378,861.37	1.231E+02	Analog	0.30	3
Ca			2	104112.950	ug/l	0.44	2,796,219.47	6.970E+00	Pulse	0.30	3
Ti			2	1864.406	ug/l	0.15	380,166.11	9.476E-01	Pulse	0.30	3
V			2	19.543	ug/l	0.13	134,560.93	3.354E-01	Pulse	0.30	3
Cr			2	19.051	ug/l	0.50	170,631.08	4.253E-01	Pulse	0.30	3
Mn			2	19.107	ug/l	0.58	91,516.88	2.281E-01	Pulse	0.30	3
Fe			2	91303.346	ug/l	0.42	631,635,441.57	1.574E+03	Analog	0.30	3
Co			2	18.256	ug/l	0.80	261,946.23	6.529E-01	Pulse	0.30	3
Ni			2	17.855	ug/l	1.08	68,696.96	1.712E-01	Pulse	0.30	3
Cu			2	15.876	ug/l	0.25	183,941.67	4.585E-01	Pulse	0.30	3
Zn			2	16.310	ug/l	1.18	26,936.72	6.715E-02	Pulse	0.30	3
As			2	19.419	ug/l	0.78	16,076.94	4.007E-02	Pulse	1.00	3
Cd			2	18.478	ug/l	0.08	40,748.83	1.890E-02	Pulse	0.30	3
Sn			2	2002.024	ug/l	1.19	8,691,562.99	4.032E+00	Analog	0.30	3
Se			3	21.370	ug/l	0.57	5,185.22	8.737E-03	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,976,527.49	0.52	92.9	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		6,228,880.53	1.18	97.1	Analog	0.10	3
1	Ge		1,169,154.38	1.26	94.0	Pulse	0.10	3
1	Ge		1,612,433.78	1.28	92.8	Pulse	0.10	3
1	Rh		8,331,971.13	0.74	86.3	Analog	0.10	3
1	In		8,662,780.28	1.74	88.4	Analog	0.10	3
1	Tb		13,989,302.71	1.14	93.9	Analog	0.10	3
1	Ho		14,291,962.29	1.15	95.1	Analog	0.10	3
1	Bi		8,167,564.67	0.97	84.0	Analog	0.10	3
2	Sc		401,194.90	1.23	100.9	Pulse	0.30	3
2	Ge		233,385.47	1.28	97.2	Pulse	0.30	3
2	Ge		349,772.88	1.32	96.3	Pulse	0.30	3
2	Rh		5,905,321.29	0.92	87.5	Analog	0.30	3
2	In		2,155,801.30	1.77	88.8	Pulse	0.30	3
2	Tb		8,698,552.99	1.25	93.6	Analog	0.30	3
2	Ho		8,891,098.53	0.41	93.2	Analog	0.30	3
2	Bi		5,225,213.82	4.21	79.2	Mix	0.30	3
3	Sc		674,377.93	0.25	98.1	Pulse	0.30	3
3	Ge		399,921.25	0.94	94.4	Pulse	0.30	3
3	Ge		593,467.87	0.40	93.5	Pulse	0.30	3
3	Rh		5,548,605.61	0.48	87.2	Analog	0.30	3
3	Tb		10,343,347.92	0.19	96.0	Analog	0.30	3

Quantitation Report

File Name	023SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 11:32
Sample Name	rinseconf
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.000	ug/l	4186.56	30.67	1.033E-05	Pulse	0.25	3
B			1	1.306	ug/l	0.97	7,915.37	2.663E-03	Pulse	0.15	3
Ca			1	3.836	ug/l	13.20	10,597.18	1.705E-03	Pulse	0.10	3
Sr			1	0.058	ug/l	2.75	3,230.47	3.406E-04	Pulse	0.10	3
Mo			1	1.171	ug/l	11.86	10,467.19	1.102E-03	Pulse	0.10	3
Ag			1	0.011	ug/l	15.89	266.68	2.751E-05	Pulse	0.10	3
Sn			1	0.303	ug/l	8.64	5,461.19	5.636E-04	Pulse	0.10	3
Sb			1	0.320	ug/l	1.93	1,656.82	1.124E-04	Pulse	0.10	3
Ba			1	0.006	ug/l	34.57	63.33	4.295E-06	Pulse	0.10	3
Tl			1	0.003	ug/l	30.28	133.34	1.406E-05	Pulse	0.10	3
Pb			1	0.008	ug/l	42.69	360.02	3.807E-05	Pulse	0.10	3
Pb			1	0.003	ug/l	154.53	346.69	3.661E-05	Pulse	0.10	3
Pb			1	0.007	ug/l	15.59	1,673.44	1.768E-04	Pulse	0.10	3
Na			2	7.996	ug/l	2.31	21,751.85	5.716E-02	Pulse	0.30	3
Mg			2	3.173	ug/l	2.65	2,153.50	5.659E-03	Pulse	0.30	3
Al			2	2.911	ug/l	13.48	703.35	1.848E-03	Pulse	0.30	3
K			2	3.694	ug/l	11.69	13,304.29	3.496E-02	Pulse	0.30	3
Ca			2	2.805	ug/l	36.64	171.11	4.497E-04	Pulse	0.30	3
Ti			2	0.562	ug/l	29.44	131.11	3.445E-04	Pulse	0.30	3
V			2	0.023	ug/l	27.68	313.34	8.233E-04	Pulse	0.30	3
Cr			2	0.009	ug/l	17.50	444.45	1.168E-03	Pulse	0.30	3
Mn			2	0.141	ug/l	4.43	175.56	4.614E-04	Pulse	0.30	3
Fe			2	9.056	ug/l	3.08	62,032.48	1.630E-01	Pulse	0.30	3
Co			2	0.001	ug/l	58.84	59.83	1.572E-04	Pulse	0.30	3
Ni			2	0.006	ug/l	40.64	57.78	1.518E-04	Pulse	0.30	3
Cu			2	-1.142	ug/l	-0.77	4,508.46	1.185E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	-0.143	ug/l	-13.09	180.00	4.729E-04	Pulse	0.30	3
As			2	0.026	ug/l	33.36	49.33	1.296E-04	Pulse	1.00	3
Cd			2	0.008	ug/l	29.27	38.78	1.637E-05	Pulse	0.30	3
Sn			2	0.529	ug/l	2.21	2,056.83	8.684E-04	Pulse	0.30	3
Se			3	0.098	ug/l	9.78	46.07	7.262E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,972,137.33	0.90	92.7	Pulse	0.10	3
1	Sc		6,213,218.87	1.10	96.9	Analog	0.10	3
1	Ge		1,220,189.43	1.08	98.1	Pulse	0.10	3
1	Ge		1,715,996.74	1.03	98.7	Pulse	0.10	3
1	Rh		9,486,946.32	1.40	98.3	Analog	0.10	3
1	In		9,689,838.25	0.94	98.9	Analog	0.10	3
1	Tb		14,741,934.36	0.37	98.9	Analog	0.10	3
1	Ho		14,914,252.28	1.02	99.2	Analog	0.10	3
1	Bi		9,467,384.44	1.28	97.4	Analog	0.10	3
2	Sc		380,573.38	0.17	95.7	Pulse	0.30	3
2	Ge		237,409.92	0.10	98.9	Pulse	0.30	3
2	Ge		357,484.73	0.45	98.4	Pulse	0.30	3
2	Rh		6,748,633.34	1.02	100.0	Analog	0.30	3
2	In		2,368,502.65	0.31	97.6	Pulse	0.30	3
2	Tb		9,134,289.08	0.53	98.3	Analog	0.30	3
2	Ho		9,345,741.30	0.82	98.0	Analog	0.30	3
2	Bi		6,464,603.08	0.22	98.0	Analog	0.30	3
3	Sc		666,874.42	0.43	97.0	Pulse	0.30	3
3	Ge		419,483.85	0.21	99.0	Pulse	0.30	3
3	Ge		634,489.82	0.82	100.0	Pulse	0.30	3
3	Rh		6,544,226.69	0.58	102.8	Analog	0.30	3
3	Tb		11,231,848.44	0.77	104.2	Analog	0.30	3

Quantitation Report

File Name	024_CCV.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 11:57
Sample Name	CCVA 5
Sample Type	CCV
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	50.088	ug/l	0.79	328,667.46	1.066E-01	Pulse	0.25	3
B			1	105.049	ug/l	1.45	496,534.13	1.610E-01	Pulse	0.15	3
Ca			1	4945.251	ug/l	1.36	4,259,911.71	6.512E-01	Pulse	0.10	3
Sr			1	49.759	ug/l	2.64	2,406,202.72	2.490E-01	Pulse	0.10	3
Mo			1	49.252	ug/l	2.50	445,790.02	4.614E-02	Pulse	0.10	3
Ag			1	48.408	ug/l	2.99	1,140,701.78	1.141E-01	Pulse	0.10	3
Sn			1	48.508	ug/l	1.61	726,115.54	7.262E-02	Pulse	0.10	3
Sb			1	49.559	ug/l	2.15	897,591.60	5.795E-02	Pulse	0.10	3
Ba			1	48.156	ug/l	2.76	367,474.28	2.372E-02	Pulse	0.10	3
Tl			1	47.986	ug/l	3.02	2,502,758.14	2.585E-01	Pulse	0.10	3
Pb			1	48.744	ug/l	3.56	869,162.38	8.977E-02	Pulse	0.10	3
Pb			1	48.615	ug/l	3.06	761,003.97	7.860E-02	Pulse	0.10	3
Pb			1	48.535	ug/l	3.06	3,483,432.52	3.598E-01	Pulse	0.10	3
Na			2	4942.263	ug/l	0.45	7,572,888.59	1.774E+01	Analog	0.30	3
Mg			2	4766.565	ug/l	0.31	3,539,287.36	8.293E+00	Pulse	0.30	3
Al			2	4871.389	ug/l	0.47	1,217,546.58	2.853E+00	Pulse	0.30	3
K			2	4939.381	ug/l	0.37	2,632,133.30	6.167E+00	Pulse	0.30	3
Ca			2	5162.664	ug/l	0.48	147,605.02	3.459E-01	Pulse	0.30	3
Ti			2	48.098	ug/l	1.87	10,457.85	2.450E-02	Pulse	0.30	3
V			2	49.172	ug/l	0.71	359,888.19	8.433E-01	Pulse	0.30	3
Cr			2	48.082	ug/l	0.95	457,487.13	1.072E+00	Pulse	0.30	3
Mn			2	48.212	ug/l	0.21	246,449.76	5.775E-01	Pulse	0.30	3
Fe			2	4879.471	ug/l	1.55	35,911,989.68	8.415E+01	Analog	0.30	3
Co			2	47.915	ug/l	0.54	731,314.54	1.714E+00	Pulse	0.30	3
Ni			2	47.553	ug/l	0.96	194,566.18	4.559E-01	Pulse	0.30	3
Cu			2	46.458	ug/l	0.31	538,208.87	1.261E+00	Pulse	0.30	3
Zn			2	46.639	ug/l	0.54	81,106.82	1.900E-01	Pulse	0.30	3
As			2	49.438	ug/l	1.11	43,489.25	1.019E-01	Pulse	1.00	3
Cd			2	48.068	ug/l	0.92	126,797.78	4.916E-02	Pulse	0.30	3
Sn			2	49.269	ug/l	1.06	255,460.00	9.904E-02	Pulse	0.30	3
Se			3	202.652	ug/l	0.61	55,250.03	8.258E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,084,193.77	1.20	96.2	Pulse	0.10	3
1	Sc		6,540,973.24	0.79	102.0	Analog	0.10	3
1	Ge		1,277,748.31	2.28	102.7	Pulse	0.10	3

Quantitation Report

1	Ge		1,777,898.25	2.26	102.3	Pulse	0.10	3
1	Rh		9,663,617.98	0.68	100.1	Analog	0.10	3
1	In		10,000,241.45	0.87	102.1	Analog	0.10	3
1	Tb		15,489,671.85	0.63	104.0	Analog	0.10	3
1	Ho		15,789,674.76	0.27	105.1	Analog	0.10	3
1	Bi		9,682,235.27	0.70	99.6	Analog	0.10	3
2	Sc		426,782.80	0.19	107.3	Pulse	0.30	3
2	Ge		259,253.90	0.90	108.0	Pulse	0.30	3
2	Ge		390,936.87	1.07	107.6	Pulse	0.30	3
2	Rh		6,952,465.14	0.95	103.1	Analog	0.30	3
2	In		2,579,257.97	1.18	106.3	Pulse	0.30	3
2	Tb		9,648,472.40	0.29	103.8	Analog	0.30	3
2	Ho		9,941,733.22	0.63	104.3	Analog	0.30	3
2	Bi		6,618,128.63	0.84	100.3	Analog	0.30	3
3	Sc		729,164.23	0.96	106.0	Pulse	0.30	3
3	Ge		443,280.92	1.06	104.6	Pulse	0.30	3
3	Ge		669,090.22	1.18	105.5	Pulse	0.30	3
3	Rh		6,507,407.80	1.46	102.3	Analog	0.30	3
3	Tb		11,255,042.05	0.78	104.5	Analog	0.30	3

Quantitation Report

File Name	025_CCB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 12:02
Sample Name	CCB
Sample Type	CCB
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.008	ug/l	6.77	84.00	2.697E-05	Pulse	0.25	3
B			1	2.612	ug/l	5.25	14,499.79	4.656E-03	Pulse	0.15	3
Ca			1	0.169	ug/l	117.23	7,998.90	1.223E-03	Pulse	0.10	3
Sr			1	0.010	ug/l	20.34	986.74	9.936E-05	Pulse	0.10	3
Mo			1	0.180	ug/l	13.11	1,730.17	1.741E-04	Pulse	0.10	3
Ag			1	0.010	ug/l	32.79	263.35	2.579E-05	Pulse	0.10	3
Sn			1	0.231	ug/l	5.06	4,670.88	4.570E-04	Pulse	0.10	3
Sb			1	0.572	ug/l	3.61	6,344.90	4.078E-04	Pulse	0.10	3
Ba			1	0.011	ug/l	35.82	106.67	6.861E-06	Pulse	0.10	3
Tl			1	0.013	ug/l	6.18	690.05	6.901E-05	Pulse	0.10	3
Pb			1	0.015	ug/l	38.26	516.70	5.179E-05	Pulse	0.10	3
Pb			1	0.011	ug/l	11.72	506.70	5.070E-05	Pulse	0.10	3
Pb			1	0.011	ug/l	31.99	2,116.81	2.120E-04	Pulse	0.10	3
Na			2	2.197	ug/l	57.64	14,249.42	3.637E-02	Pulse	0.30	3
Mg			2	0.643	ug/l	35.48	486.68	1.258E-03	Pulse	0.30	3
Al			2	0.767	ug/l	43.81	228.89	5.921E-04	Pulse	0.30	3
K			2	2.177	ug/l	146.65	12,968.48	3.307E-02	Pulse	0.30	3
Ca			2	0.534	ug/l	99.59	116.67	2.977E-04	Pulse	0.30	3
Ti			2	0.026	ug/l	166.46	27.78	7.183E-05	Pulse	0.30	3
V			2	0.009	ug/l	72.64	227.78	5.844E-04	Pulse	0.30	3
Cr			2	0.012	ug/l	41.73	483.35	1.225E-03	Pulse	0.30	3
Mn			2	0.137	ug/l	3.95	161.11	4.071E-04	Pulse	0.30	3
Fe			2	2.100	ug/l	21.06	16,806.46	4.306E-02	Pulse	0.30	3
Co			2	0.002	ug/l	87.85	69.96	1.814E-04	Pulse	0.30	3
Ni			2	0.008	ug/l	102.67	67.78	1.774E-04	Pulse	0.30	3
Cu			2	-0.884	ug/l	-11.90	7,282.81	1.862E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	-0.135	ug/l	-12.60	197.78	5.045E-04	Pulse	0.30	3
As			2	0.024	ug/l	89.21	49.00	1.267E-04	Pulse	1.00	3
Cd			2	0.008	ug/l	39.70	39.79	1.656E-05	Pulse	0.30	3
Sn			2	0.540	ug/l	11.47	2,124.61	8.906E-04	Pulse	0.30	3
Se			3	0.166	ug/l	9.48	66.80	1.004E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,113,988.21	0.60	97.2	Pulse	0.10	3
1	Sc		6,539,098.03	0.25	102.0	Analog	0.10	3
1	Ge		1,302,522.61	1.87	104.7	Pulse	0.10	3
1	Ge		1,822,770.80	1.20	104.9	Pulse	0.10	3
1	Rh		9,936,283.60	1.15	102.9	Analog	0.10	3
1	In		10,219,883.96	0.38	104.3	Analog	0.10	3
1	Tb		15,558,111.85	0.56	104.4	Analog	0.10	3
1	Ho		15,725,944.77	0.61	104.6	Analog	0.10	3
1	Bi		9,993,255.27	1.52	102.8	Analog	0.10	3
2	Sc		395,501.43	11.20	99.4	Pulse	0.30	3
2	Ge		238,942.13	14.00	99.5	Pulse	0.30	3
2	Ge		360,202.05	13.88	99.2	Pulse	0.30	3
2	Rh		6,737,540.29	12.32	99.9	Analog	0.30	3
2	In		2,412,915.89	12.49	99.4	Pulse	0.30	3
2	Tb		9,079,053.53	11.92	97.7	Analog	0.30	3
2	Ho		9,280,377.96	11.39	97.3	Analog	0.30	3
2	Bi		6,276,990.72	12.93	95.1	Analog	0.30	3
3	Sc		708,903.53	1.37	103.1	Pulse	0.30	3
3	Ge		442,614.55	0.48	104.4	Pulse	0.30	3
3	Ge		665,357.18	0.39	104.9	Pulse	0.30	3
3	Rh		6,724,950.43	1.63	105.7	Analog	0.30	3
3	Tb		11,328,879.27	0.78	105.1	Analog	0.30	3

Quantitation Report

File Name	026SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 12:15
Sample Name	JD1240-1Q 4
Sample Type	Sample
Comment	
Prep Dilution	2.000
Auto Dilution	N/A
Total Dilution	2.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	-0.004	ug/l	-82.78	20.00	6.269E-06	Pulse	0.25	3
B			1	1.642	ug/l	7.86	6,139.06	1.923E-03	Pulse	0.15	3
Ca			1	65.599	ug/l	1.48	37,533.31	5.512E-03	Pulse	0.10	3
Sr			1	0.060	ug/l	11.70	2,046.88	2.007E-04	Pulse	0.10	3
Mo			1	0.152	ug/l	8.13	783.39	7.676E-05	Pulse	0.10	3
Ag			1	0.005	ug/l	77.05	80.00	7.560E-06	Pulse	0.10	3
Sn			1	0.030	ug/l	83.87	1,413.45	1.337E-04	Pulse	0.10	3
Sb			1	0.716	ug/l	2.47	2,486.96	1.567E-04	Pulse	0.10	3
Ba			1	0.035	ug/l	53.38	156.68	9.860E-06	Pulse	0.10	3
Tl			1	0.013	ug/l	23.10	343.36	3.395E-05	Pulse	0.10	3
Pb			1	0.009	ug/l	47.73	316.68	3.130E-05	Pulse	0.10	3
Pb			1	-0.009	ug/l	-28.37	260.01	2.569E-05	Pulse	0.10	3
Pb			1	-0.002	ug/l	-135.71	1,230.07	1.215E-04	Pulse	0.10	3
Na			2	12.089	ug/l	27.17	22,197.82	5.016E-02	Pulse	0.30	3
Mg			2	1.985	ug/l	1.07	825.59	1.866E-03	Pulse	0.30	3
Al			2	1.380	ug/l	29.16	242.23	5.472E-04	Pulse	0.30	3
K			2	0.266	ug/l	301.45	13,511.15	3.053E-02	Pulse	0.30	3
Ca			2	61.648	ug/l	1.31	1,028.93	2.325E-03	Pulse	0.30	3
Ti			2	0.729	ug/l	58.90	107.78	2.439E-04	Pulse	0.30	3
V			2	0.024	ug/l	85.82	278.89	6.308E-04	Pulse	0.30	3
Cr			2	0.006	ug/l	180.72	453.35	1.025E-03	Pulse	0.30	3
Mn			2	0.275	ug/l	5.35	184.45	4.166E-04	Pulse	0.30	3
Fe			2	1.581	ug/l	34.28	9,063.51	2.048E-02	Pulse	0.30	3
Co			2	0.002	ug/l	122.73	64.42	1.454E-04	Pulse	0.30	3
Ni			2	-0.001	ug/l	-413.41	41.11	9.297E-05	Pulse	0.30	3
Cu			2	-2.404	ug/l	-1.13	4,544.01	1.027E-02	Pulse	0.30	3
Zn			2	-0.298	ug/l	-6.15	198.89	4.496E-04	Pulse	0.30	3
As			2	0.055	ug/l	30.76	59.33	1.341E-04	Pulse	1.00	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Cd			2	-0.005	ug/l	-109.47	15.45	5.851E-06	Pulse	0.30	3
Sn			2	0.419	ug/l	3.18	596.69	2.260E-04	Pulse	0.30	3
Se			3	0.117	ug/l	4.90	38.73	5.666E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,193,304.66	0.72	99.6	Pulse	0.10	3
1	Sc		6,809,146.35	1.28	106.2	Analog	0.10	3
1	Ge		1,330,658.94	1.53	107.0	Pulse	0.10	3
1	Ge		1,853,925.91	1.40	106.7	Pulse	0.10	3
1	Rh		10,201,068.18	0.94	105.7	Analog	0.10	3
1	In		10,562,906.73	0.66	107.8	Analog	0.10	3
1	Tb		15,862,866.01	1.05	106.5	Analog	0.10	3
1	Ho		16,077,899.34	0.76	107.0	Analog	0.10	3
1	Bi		10,121,145.05	0.56	104.1	Analog	0.10	3
2	Sc		442,511.15	0.51	111.3	Pulse	0.30	3
2	Ge		267,771.94	0.25	111.5	Pulse	0.30	3
2	Ge		403,105.38	0.79	111.0	Pulse	0.30	3
2	Rh		7,375,778.32	1.26	109.3	Analog	0.30	3
2	In		2,639,483.30	1.03	108.8	Pulse	0.30	3
2	Tb		10,029,432.94	0.56	107.9	Analog	0.30	3
2	Ho		10,168,284.32	0.73	106.6	Analog	0.30	3
2	Bi		6,959,738.75	0.35	105.5	Analog	0.30	3
3	Sc		738,424.38	0.48	107.4	Pulse	0.30	3
3	Ge		454,422.48	0.07	107.2	Pulse	0.30	3
3	Ge		683,536.88	0.66	107.7	Pulse	0.30	3
3	Rh		6,902,944.87	0.84	108.5	Analog	0.30	3
3	Tb		11,488,220.65	0.44	106.6	Analog	0.30	3

Quantitation Report

File Name	027SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 12:20
Sample Name	JD1305-2A 5
Sample Type	Sample
Comment	
Prep Dilution	2.000
Auto Dilution	N/A
Total Dilution	2.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.030	ug/l	16.05	117.33	4.237E-05	Pulse	0.25	3
B			1	162.949	ug/l	1.71	345,970.65	1.250E-01	Pulse	0.15	3
Ca			1	88803.512	ug/l	0.76	35,348,718.64	5.838E+00	Analog	0.10	3
Sr			1	506.479	ug/l	0.55	10,769,145.26	1.267E+00	Analog	0.10	3
Mo			1	1.497	ug/l	2.67	6,008.04	7.069E-04	Pulse	0.10	3
Ag			1	0.028	ug/l	15.82	313.35	3.441E-05	Pulse	0.10	3
Sn			1	1.086	ug/l	7.07	8,402.55	9.228E-04	Pulse	0.10	3
Sb			1	1.572	ug/l	1.20	9,539.88	6.593E-04	Pulse	0.10	3
Ba			1	127.236	ug/l	1.23	453,439.69	3.134E-02	Pulse	0.10	3
Tl			1	3.384	ug/l	2.62	79,313.32	9.115E-03	Pulse	0.10	3
Pb			1	0.269	ug/l	11.95	2,356.95	2.707E-04	Pulse	0.10	3
Pb			1	0.275	ug/l	15.72	2,216.94	2.550E-04	Pulse	0.10	3
Pb			1	0.260	ug/l	8.91	9,488.22	1.091E-03	Pulse	0.10	3
Na			2	97999.695	ug/l	0.82	67,987,683.96	1.757E+02	Analog	0.30	3
Mg			2	40021.444	ug/l	0.61	13,474,053.91	3.481E+01	Analog	0.30	3
Al			2	27.077	ug/l	6.95	3,123.82	8.071E-03	Pulse	0.30	3
K			2	10266.818	ug/l	0.36	2,480,208.30	6.408E+00	Pulse	0.30	3
Ca			2	88479.452	ug/l	0.21	1,146,253.56	2.962E+00	Pulse	0.30	3
Ti			2	0.786	ug/l	28.16	100.00	2.584E-04	Pulse	0.30	3
V			2	15.822	ug/l	1.10	52,643.23	1.360E-01	Pulse	0.30	3
Cr			2	5.869	ug/l	2.41	25,667.87	6.632E-02	Pulse	0.30	3
Mn			2	9034.409	ug/l	0.66	20,984,159.17	5.422E+01	Analog	0.30	3
Fe			2	13349.163	ug/l	0.48	44,546,817.12	1.151E+02	Analog	0.30	3
Co			2	405.443	ug/l	0.48	2,805,693.64	7.249E+00	Pulse	0.30	3
Ni			2	30.820	ug/l	1.05	57,201.17	1.478E-01	Pulse	0.30	3
Cu			2	22.391	ug/l	0.97	129,899.09	3.356E-01	Pulse	0.30	3
Zn			2	38.909	ug/l	0.82	30,918.13	7.989E-02	Pulse	0.30	3
As			2	11.458	ug/l	2.53	4,596.66	1.188E-02	Pulse	1.00	3
Cd			2	0.961	ug/l	0.42	1,148.42	4.997E-04	Pulse	0.30	3
Sn			2	1.531	ug/l	7.30	3,093.68	1.346E-03	Pulse	0.30	3
Se			3	1.428	ug/l	1.01	201.53	3.236E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,767,585.42	0.86	86.4	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		6,055,742.41	1.18	94.4	Analog	0.10	3
1	Ge		1,171,540.97	1.93	94.2	Pulse	0.10	3
1	Ge		1,630,915.55	1.13	93.8	Pulse	0.10	3
1	Rh		8,498,578.00	1.46	88.0	Analog	0.10	3
1	In		9,105,716.06	0.26	92.9	Analog	0.10	3
1	Tb		14,468,282.70	1.35	97.1	Analog	0.10	3
1	Ho		14,763,029.78	1.05	98.2	Analog	0.10	3
1	Bi		8,702,534.66	0.91	89.5	Analog	0.10	3
2	Sc		387,022.82	0.12	97.3	Pulse	0.30	3
2	Ge		238,357.22	0.49	99.3	Pulse	0.30	3
2	Ge		358,599.60	0.53	98.7	Pulse	0.30	3
2	Rh		6,238,919.33	0.92	92.5	Analog	0.30	3
2	In		2,298,364.96	0.85	94.7	Pulse	0.30	3
2	Tb		9,018,140.48	1.42	97.1	Analog	0.30	3
2	Ho		9,294,015.46	0.31	97.5	Analog	0.30	3
2	Bi		5,973,135.87	1.10	90.5	Analog	0.30	3
3	Sc		680,169.73	0.40	98.9	Pulse	0.30	3
3	Ge		411,441.22	0.77	97.1	Pulse	0.30	3
3	Ge		622,777.89	0.97	98.2	Pulse	0.30	3
3	Rh		6,013,368.23	0.53	94.5	Analog	0.30	3
3	Tb		11,026,524.00	0.79	102.3	Analog	0.30	3

Quantitation Report

File Name	028SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 12:25
Sample Name	JD1305-2FA
Sample Type	Sample
Comment	
Prep Dilution	2.000
Auto Dilution	N/A
Total Dilution	2.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.010	ug/l	69.48	57.33	2.042E-05	Pulse	0.25	3
B			1	160.264	ug/l	1.05	345,371.94	1.230E-01	Pulse	0.15	3
Ca			1	91013.996	ug/l	0.55	35,780,828.63	5.983E+00	Analog	0.10	3
Sr			1	511.002	ug/l	3.06	10,873,073.59	1.278E+00	Analog	0.10	3
Mo			1	1.269	ug/l	4.81	5,107.70	6.000E-04	Pulse	0.10	3
Ag			1	0.020	ug/l	25.61	226.68	2.499E-05	Pulse	0.10	3
Sn			1	0.586	ug/l	5.80	4,980.98	5.493E-04	Pulse	0.10	3
Sb			1	1.180	ug/l	2.62	6,288.19	4.292E-04	Pulse	0.10	3
Ba			1	96.485	ug/l	2.00	348,218.19	2.377E-02	Pulse	0.10	3
Tl			1	3.179	ug/l	0.42	75,198.36	8.561E-03	Pulse	0.10	3
Pb			1	0.042	ug/l	33.69	546.70	6.231E-05	Pulse	0.10	3
Pb			1	0.030	ug/l	52.95	500.03	5.699E-05	Pulse	0.10	3
Pb			1	0.040	ug/l	7.17	2,436.85	2.776E-04	Pulse	0.10	3
Na			2	98238.009	ug/l	0.39	67,380,410.66	1.761E+02	Analog	0.30	3
Mg			2	40623.231	ug/l	0.76	13,521,310.02	3.534E+01	Analog	0.30	3
Al			2	2.843	ug/l	8.78	373.34	9.756E-04	Pulse	0.30	3
K			2	10095.729	ug/l	0.85	2,411,374.69	6.302E+00	Pulse	0.30	3
Ca			2	89785.986	ug/l	0.76	1,149,979.08	3.005E+00	Pulse	0.30	3
Ti			2	0.261	ug/l	40.99	47.78	1.250E-04	Pulse	0.30	3
V			2	2.584	ug/l	1.26	8,636.83	2.257E-02	Pulse	0.30	3
Cr			2	2.013	ug/l	2.09	8,948.06	2.338E-02	Pulse	0.30	3
Mn			2	8555.425	ug/l	0.89	19,645,969.78	5.135E+01	Analog	0.30	3
Fe			2	10963.875	ug/l	0.92	36,172,183.01	9.454E+01	Analog	0.30	3
Co			2	380.222	ug/l	1.86	2,601,201.26	6.798E+00	Pulse	0.30	3
Ni			2	30.278	ug/l	1.74	55,559.07	1.452E-01	Pulse	0.30	3
Cu			2	12.491	ug/l	2.70	78,711.37	2.057E-01	Pulse	0.30	3
Zn			2	39.687	ug/l	1.99	31,169.70	8.146E-02	Pulse	0.30	3
As			2	4.041	ug/l	6.15	1,621.42	4.238E-03	Pulse	1.00	3
Cd			2	0.999	ug/l	6.14	1,190.73	5.192E-04	Pulse	0.30	3
Sn			2	0.964	ug/l	1.73	1,775.68	7.742E-04	Pulse	0.30	3
Se			3	0.737	ug/l	1.44	114.33	1.829E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,808,656.95	0.05	87.6	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		5,980,647.62	0.53	93.3	Analog	0.10	3
1	Ge		1,184,229.12	1.40	95.2	Pulse	0.10	3
1	Ge		1,664,675.70	0.98	95.8	Pulse	0.10	3
1	Rh		8,508,524.46	2.17	88.1	Analog	0.10	3
1	In		9,067,030.63	0.33	92.5	Analog	0.10	3
1	Tb		14,649,606.03	1.13	98.3	Analog	0.10	3
1	Ho		14,874,740.20	0.29	99.0	Analog	0.10	3
1	Bi		8,782,955.70	1.59	90.3	Analog	0.10	3
2	Sc		382,638.14	0.53	96.2	Pulse	0.30	3
2	Ge		236,874.46	1.08	98.6	Pulse	0.30	3
2	Ge		357,910.89	1.19	98.5	Pulse	0.30	3
2	Rh		6,220,203.09	0.62	92.2	Analog	0.30	3
2	In		2,293,711.18	0.65	94.5	Pulse	0.30	3
2	Tb		8,968,384.64	0.72	96.5	Analog	0.30	3
2	Ho		9,294,392.69	0.32	97.5	Analog	0.30	3
2	Bi		5,869,112.82	0.49	89.0	Analog	0.30	3
3	Sc		682,164.02	0.35	99.2	Pulse	0.30	3
3	Ge		416,186.22	0.77	98.2	Pulse	0.30	3
3	Ge		625,104.75	0.59	98.5	Pulse	0.30	3
3	Rh		6,129,484.76	0.38	96.3	Analog	0.30	3
3	Tb		11,137,779.28	0.69	103.4	Analog	0.30	3

Quantitation Report

File Name	029SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 12:30
Sample Name	MP19163-MB1CONF
Sample Type	Sample
Comment	
Prep Dilution	2.000
Auto Dilution	N/A
Total Dilution	2.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.013	ug/l	49.20	72.00	2.447E-05	Pulse	0.25	3
B			1	5.217	ug/l	4.93	13,705.79	4.651E-03	Pulse	0.15	3
Ca			1	25.539	ug/l	3.62	18,056.98	2.879E-03	Pulse	0.10	3
Sr			1	0.047	ug/l	15.16	1,600.16	1.684E-04	Pulse	0.10	3
Mo			1	0.052	ug/l	28.79	286.68	3.011E-05	Pulse	0.10	3
Ag			1	0.020	ug/l	2.41	243.34	2.485E-05	Pulse	0.10	3
Sn			1	0.525	ug/l	4.34	4,934.33	5.037E-04	Pulse	0.10	3
Sb			1	0.883	ug/l	1.35	3,863.98	2.547E-04	Pulse	0.10	3
Ba			1	0.081	ug/l	25.78	323.35	2.132E-05	Pulse	0.10	3
Tl			1	0.008	ug/l	6.99	203.34	2.104E-05	Pulse	0.10	3
Pb			1	0.025	ug/l	19.51	450.02	4.659E-05	Pulse	0.10	3
Pb			1	0.002	ug/l	54.08	333.35	3.450E-05	Pulse	0.10	3
Pb			1	0.009	ug/l	12.45	1,570.10	1.625E-04	Pulse	0.10	3
Na			2	20.310	ug/l	3.12	25,826.41	6.489E-02	Pulse	0.30	3
Mg			2	3.448	ug/l	6.04	1,248.95	3.138E-03	Pulse	0.30	3
Al			2	3.328	ug/l	22.79	444.46	1.118E-03	Pulse	0.30	3
K			2	3.435	ug/l	39.25	12,937.34	3.250E-02	Pulse	0.30	3
Ca			2	21.850	ug/l	21.42	395.57	9.932E-04	Pulse	0.30	3
Ti			2	0.318	ug/l	21.65	55.55	1.396E-04	Pulse	0.30	3
V			2	0.130	ug/l	11.37	614.47	1.544E-03	Pulse	0.30	3
Cr			2	0.576	ug/l	3.31	2,936.97	7.380E-03	Pulse	0.30	3
Mn			2	0.718	ug/l	1.29	1,224.51	3.077E-03	Pulse	0.30	3
Fe			2	7.534	ug/l	3.92	28,579.35	7.180E-02	Pulse	0.30	3
Co			2	0.018	ug/l	10.01	174.37	4.383E-04	Pulse	0.30	3
Ni			2	0.049	ug/l	9.59	132.23	3.323E-04	Pulse	0.30	3
Cu			2	3.199	ug/l	2.68	33,350.61	8.379E-02	Pulse	0.30	3
Zn			2	-0.053	ug/l	-88.80	376.68	9.466E-04	Pulse	0.30	3
As			2	0.151	ug/l	26.99	92.33	2.322E-04	Pulse	1.00	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Cd			2	0.022	ug/l	32.33	46.63	1.928E-05	Pulse	0.30	3
Sn			2	0.932	ug/l	6.66	1,794.57	7.424E-04	Pulse	0.30	3
Se			3	0.268	ug/l	4.57	58.53	8.744E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,946,539.70	0.79	91.9	Pulse	0.10	3
1	Sc		6,271,271.16	0.41	97.8	Analog	0.10	3
1	Ge		1,266,279.49	1.36	101.8	Pulse	0.10	3
1	Ge		1,759,446.43	0.90	101.2	Pulse	0.10	3
1	Rh		9,504,177.77	1.23	98.5	Analog	0.10	3
1	In		9,794,882.41	1.51	100.0	Analog	0.10	3
1	Tb		15,171,806.85	0.38	101.8	Analog	0.10	3
1	Ho		15,499,318.10	0.86	103.1	Analog	0.10	3
1	Bi		9,660,511.32	0.52	99.4	Analog	0.10	3
2	Sc		398,003.31	0.73	100.1	Pulse	0.30	3
2	Ge		248,962.83	0.76	103.7	Pulse	0.30	3
2	Ge		375,937.90	0.39	103.5	Pulse	0.30	3
2	Rh		6,889,950.14	0.49	102.1	Analog	0.30	3
2	In		2,417,437.72	0.44	99.6	Pulse	0.30	3
2	Tb		9,360,007.41	0.70	100.7	Analog	0.30	3
2	Ho		9,710,049.61	0.68	101.8	Analog	0.30	3
2	Bi		6,567,310.85	0.34	99.5	Analog	0.30	3
3	Sc		710,448.58	0.45	103.3	Pulse	0.30	3
3	Ge		444,792.64	0.61	104.9	Pulse	0.30	3
3	Ge		669,408.77	0.56	105.5	Pulse	0.30	3
3	Rh		6,884,747.37	0.45	108.2	Analog	0.30	3
3	Tb		11,743,413.42	0.82	109.0	Analog	0.30	3

Quantitation Report

File Name	030SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 12:35
Sample Name	MP19163-B2CONF
Sample Type	Sample
Comment	
Prep Dilution	2.000
Auto Dilution	N/A
Total Dilution	2.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	72.318	ug/l	1.60	222,275.34	7.693E-02	Pulse	0.25	3
B			1	87.046	ug/l	1.35	193,846.43	6.709E-02	Pulse	0.15	3
Ca			1	3998.691	ug/l	0.41	1,627,028.15	2.640E-01	Pulse	0.10	3
Sr			1	73.505	ug/l	1.71	1,704,819.51	1.839E-01	Pulse	0.10	3
Mo			1	77.878	ug/l	1.51	338,054.61	3.648E-02	Pulse	0.10	3
Ag			1	75.817	ug/l	2.53	863,313.14	8.934E-02	Pulse	0.10	3
Sn			1	76.228	ug/l	3.53	551,590.44	5.708E-02	Pulse	0.10	3
Sb			1	76.822	ug/l	2.37	669,872.06	4.486E-02	Pulse	0.10	3
Ba			1	72.291	ug/l	1.57	265,929.31	1.781E-02	Pulse	0.10	3
Tl			1	71.976	ug/l	1.17	1,827,780.39	1.939E-01	Pulse	0.10	3
Pb			1	80.704	ug/l	0.58	700,677.00	7.432E-02	Pulse	0.10	3
Pb			1	80.089	ug/l	0.24	610,451.49	6.475E-02	Pulse	0.10	3
Pb			1	80.206	ug/l	1.12	2,803,039.25	2.973E-01	Pulse	0.10	3
Na			2	3960.501	ug/l	0.60	2,802,448.99	7.127E+00	Pulse	0.30	3
Mg			2	3848.611	ug/l	0.92	1,316,528.63	3.348E+00	Pulse	0.30	3
Al			2	3825.660	ug/l	0.84	440,530.66	1.120E+00	Pulse	0.30	3
K			2	3912.341	ug/l	0.48	967,682.11	2.461E+00	Pulse	0.30	3
Ca			2	4213.640	ug/l	1.36	55,563.35	1.413E-01	Pulse	0.30	3
Ti			2	75.640	ug/l	1.07	7,581.81	1.928E-02	Pulse	0.30	3
V			2	74.350	ug/l	0.71	250,729.97	6.376E-01	Pulse	0.30	3
Cr			2	74.408	ug/l	0.81	326,234.01	8.296E-01	Pulse	0.30	3
Mn			2	72.531	ug/l	1.05	170,685.60	4.341E-01	Pulse	0.30	3
Fe			2	3988.782	ug/l	1.30	13,525,723.91	3.440E+01	Analog	0.30	3
Co			2	74.168	ug/l	0.57	521,523.13	1.326E+00	Pulse	0.30	3
Ni			2	73.315	ug/l	0.54	138,208.26	3.515E-01	Pulse	0.30	3
Cu			2	76.202	ug/l	0.84	409,651.57	1.042E+00	Pulse	0.30	3
Zn			2	65.446	ug/l	2.37	52,554.94	1.337E-01	Pulse	0.30	3
As			2	72.346	ug/l	0.32	29,327.86	7.458E-02	Pulse	1.00	3
Cd			2	71.025	ug/l	0.50	87,838.15	3.632E-02	Pulse	0.30	3
Sn			2	77.884	ug/l	0.21	189,210.78	7.824E-02	Pulse	0.30	3
Se			3	346.428	ug/l	0.26	47,425.59	7.059E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,889,503.43	1.47	90.2	Pulse	0.10	3
1	Sc		6,162,958.87	0.97	96.1	Analog	0.10	3
1	Ge		1,238,914.88	1.54	99.6	Pulse	0.10	3

Quantitation Report

1	Ge		1,737,952.74	1.69	100.0	Pulse	0.10	3
1	Rh		9,268,009.65	0.38	96.0	Analog	0.10	3
1	In		9,665,061.30	0.82	98.7	Analog	0.10	3
1	Tb		14,932,662.70	0.64	100.2	Analog	0.10	3
1	Ho		15,168,739.36	0.90	100.9	Analog	0.10	3
1	Bi		9,427,534.23	1.26	97.0	Analog	0.10	3
2	Sc		393,241.16	0.74	98.9	Pulse	0.30	3
2	Ge		247,021.86	0.28	102.9	Pulse	0.30	3
2	Ge		373,430.55	0.82	102.8	Pulse	0.30	3
2	Rh		6,729,567.09	0.46	99.8	Analog	0.30	3
2	In		2,418,355.71	0.82	99.7	Pulse	0.30	3
2	Tb		9,295,496.58	0.20	100.0	Analog	0.30	3
2	Ho		9,449,755.74	0.19	99.1	Analog	0.30	3
2	Bi		6,332,216.55	0.53	96.0	Analog	0.30	3
3	Sc		711,157.87	0.64	103.4	Pulse	0.30	3
3	Ge		443,188.12	0.73	104.6	Pulse	0.30	3
3	Ge		671,879.57	0.19	105.9	Pulse	0.30	3
3	Rh		6,688,912.51	0.68	105.1	Analog	0.30	3
3	Tb		11,655,746.21	0.59	108.2	Analog	0.30	3

Quantitation Report

File Name	031SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 12:40
Sample Name	JD1172-1
Sample Type	Sample
Comment	
Prep Dilution	2.000
Auto Dilution	N/A
Total Dilution	2.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.003	ug/l	48.67	38.67	1.400E-05	Pulse	0.25	3
B			1	113.091	ug/l	1.66	240,314.88	8.697E-02	Pulse	0.15	3
Ca			1	38940.704	ug/l	1.06	15,206,121.02	2.560E+00	Analog	0.10	3
Sr			1	281.886	ug/l	3.32	6,131,760.11	7.053E-01	Analog	0.10	3
Mo			1	0.424	ug/l	6.40	1,773.51	2.041E-04	Pulse	0.10	3
Ag			1	0.022	ug/l	22.19	256.68	2.765E-05	Pulse	0.10	3
Sn			1	1.237	ug/l	7.23	9,635.75	1.035E-03	Pulse	0.10	3
Sb			1	1.009	ug/l	3.76	4,804.24	3.286E-04	Pulse	0.10	3
Ba			1	13.204	ug/l	2.80	47,557.72	3.254E-03	Pulse	0.10	3
Tl			1	0.012	ug/l	12.61	303.35	3.355E-05	Pulse	0.10	3
Pb			1	0.265	ug/l	4.56	2,420.29	2.677E-04	Pulse	0.10	3
Pb			1	0.264	ug/l	10.83	2,226.93	2.463E-04	Pulse	0.10	3
Pb			1	0.250	ug/l	5.22	9,524.91	1.053E-03	Pulse	0.10	3
Na			2	23516.069	ug/l	1.39	15,882,983.82	4.218E+01	Analog	0.30	3
Mg			2	5192.129	ug/l	0.24	1,701,029.03	4.517E+00	Pulse	0.30	3
Al			2	4.126	ug/l	3.09	508.91	1.351E-03	Pulse	0.30	3
K			2	7223.402	ug/l	0.42	1,701,434.55	4.518E+00	Pulse	0.30	3
Ca			2	39007.149	ug/l	0.88	491,783.09	1.306E+00	Pulse	0.30	3
Ti			2	0.837	ug/l	31.29	102.22	2.713E-04	Pulse	0.30	3
V			2	0.183	ug/l	20.23	751.14	1.995E-03	Pulse	0.30	3
Cr			2	0.830	ug/l	1.96	3,842.72	1.020E-02	Pulse	0.30	3
Mn			2	24.616	ug/l	0.53	55,173.94	1.465E-01	Pulse	0.30	3
Fe			2	653.952	ug/l	0.76	2,126,017.27	5.645E+00	Pulse	0.30	3
Co			2	0.386	ug/l	1.76	2,638.95	7.007E-03	Pulse	0.30	3
Ni			2	4.979	ug/l	0.13	9,023.68	2.396E-02	Pulse	0.30	3
Cu			2	21.021	ug/l	0.77	119,632.89	3.177E-01	Pulse	0.30	3
Zn			2	18.286	ug/l	1.79	14,349.74	3.810E-02	Pulse	0.30	3
As			2	25.840	ug/l	2.44	10,051.11	2.669E-02	Pulse	1.00	3
Cd			2	0.008	ug/l	143.42	28.71	1.239E-05	Pulse	0.30	3
Sn			2	1.526	ug/l	3.57	3,099.23	1.340E-03	Pulse	0.30	3
Se			3	0.366	ug/l	14.95	69.60	1.072E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,763,456.69	0.92	86.2	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		5,939,084.70	0.74	92.6	Analog	0.10	3
1	Ge		1,200,837.20	0.99	96.5	Pulse	0.10	3
1	Ge		1,684,974.25	0.26	96.9	Pulse	0.10	3
1	Rh		8,696,829.25	1.56	90.1	Analog	0.10	3
1	In		9,301,723.47	1.59	94.9	Analog	0.10	3
1	Tb		14,617,647.28	0.74	98.1	Analog	0.10	3
1	Ho		14,885,822.69	1.71	99.0	Analog	0.10	3
1	Bi		9,042,507.58	0.22	93.0	Analog	0.10	3
2	Sc		376,605.14	0.35	94.7	Pulse	0.30	3
2	Ge		240,374.28	0.98	100.1	Pulse	0.30	3
2	Ge		363,250.20	1.05	100.0	Pulse	0.30	3
2	Rh		6,471,742.52	1.00	95.9	Analog	0.30	3
2	In		2,312,272.12	0.66	95.3	Pulse	0.30	3
2	Tb		8,922,428.26	0.49	96.0	Analog	0.30	3
2	Ho		9,182,729.08	0.82	96.3	Analog	0.30	3
2	Bi		6,131,824.76	0.21	92.9	Analog	0.30	3
3	Sc		688,886.76	0.63	100.2	Pulse	0.30	3
3	Ge		429,167.73	1.01	101.3	Pulse	0.30	3
3	Ge		649,670.79	1.39	102.4	Pulse	0.30	3
3	Rh		6,497,807.66	0.98	102.1	Analog	0.30	3
3	Tb		11,487,273.43	0.70	106.6	Analog	0.30	3

Quantitation Report

File Name	032SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 12:45
Sample Name	MP19189A-MB1CONF
Sample Type	Sample
Comment	
Prep Dilution	2.000
Auto Dilution	N/A
Total Dilution	2.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.006	ug/l	140.43	45.33	1.628E-05	Pulse	0.25	3
B			1	5.095	ug/l	2.84	12,720.61	4.558E-03	Pulse	0.15	3
Ca			1	32.826	ug/l	3.61	20,626.75	3.358E-03	Pulse	0.10	3
Sr			1	0.053	ug/l	7.36	1,710.15	1.838E-04	Pulse	0.10	3
Mo			1	0.051	ug/l	20.73	273.35	2.939E-05	Pulse	0.10	3
Ag			1	0.015	ug/l	17.22	186.68	1.932E-05	Pulse	0.10	3
Sn			1	0.471	ug/l	9.02	4,470.80	4.629E-04	Pulse	0.10	3
Sb			1	0.812	ug/l	1.21	3,147.11	2.132E-04	Pulse	0.10	3
Ba			1	0.070	ug/l	10.36	273.34	1.851E-05	Pulse	0.10	3
Tl			1	0.008	ug/l	33.98	210.01	2.202E-05	Pulse	0.10	3
Pb			1	0.019	ug/l	45.64	386.69	4.059E-05	Pulse	0.10	3
Pb			1	0.009	ug/l	71.99	376.69	3.953E-05	Pulse	0.10	3
Pb			1	0.012	ug/l	31.65	1,646.77	1.728E-04	Pulse	0.10	3
Na			2	17.408	ug/l	2.69	23,491.92	5.969E-02	Pulse	0.30	3
Mg			2	2.737	ug/l	9.59	991.15	2.520E-03	Pulse	0.30	3
Al			2	3.897	ug/l	19.04	505.58	1.284E-03	Pulse	0.30	3
K			2	3.329	ug/l	35.63	12,765.02	3.244E-02	Pulse	0.30	3
Ca			2	30.461	ug/l	4.32	504.46	1.281E-03	Pulse	0.30	3
Ti			2	0.269	ug/l	23.34	50.00	1.271E-04	Pulse	0.30	3
V			2	0.153	ug/l	6.76	684.47	1.739E-03	Pulse	0.30	3
Cr			2	0.587	ug/l	4.66	2,951.42	7.498E-03	Pulse	0.30	3
Mn			2	0.444	ug/l	6.70	562.24	1.429E-03	Pulse	0.30	3
Fe			2	5.841	ug/l	1.38	22,514.38	5.720E-02	Pulse	0.30	3
Co			2	0.007	ug/l	15.21	94.39	2.398E-04	Pulse	0.30	3
Ni			2	0.029	ug/l	44.89	92.22	2.346E-04	Pulse	0.30	3
Cu			2	5.323	ug/l	4.14	43,944.12	1.117E-01	Pulse	0.30	3
Zn			2	-0.145	ug/l	-41.65	298.90	7.602E-04	Pulse	0.30	3
As			2	0.129	ug/l	18.58	82.67	2.099E-04	Pulse	1.00	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Cd			2	0.005	ug/l	314.13	25.51	1.069E-05	Pulse	0.30	3
Sn			2	0.856	ug/l	3.73	1,584.56	6.653E-04	Pulse	0.30	3
Se			3	0.211	ug/l	25.98	51.20	7.567E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,791,302.38	1.36	87.1	Pulse	0.10	3
1	Sc		6,143,570.54	1.80	95.8	Analog	0.10	3
1	Ge		1,240,601.49	1.22	99.7	Pulse	0.10	3
1	Ge		1,730,292.74	1.50	99.5	Pulse	0.10	3
1	Rh		9,301,743.82	0.36	96.4	Analog	0.10	3
1	In		9,660,079.79	1.17	98.6	Analog	0.10	3
1	Tb		14,757,175.61	0.99	99.0	Analog	0.10	3
1	Ho		15,159,996.86	1.25	100.9	Analog	0.10	3
1	Bi		9,530,572.98	0.49	98.0	Analog	0.10	3
2	Sc		393,593.96	1.04	99.0	Pulse	0.30	3
2	Ge		247,779.19	1.40	103.2	Pulse	0.30	3
2	Ge		373,399.57	1.18	102.8	Pulse	0.30	3
2	Rh		6,914,927.92	0.54	102.5	Analog	0.30	3
2	In		2,381,869.82	0.54	98.2	Pulse	0.30	3
2	Tb		9,336,554.07	1.24	100.5	Analog	0.30	3
2	Ho		9,554,198.23	0.80	100.2	Analog	0.30	3
2	Bi		6,537,065.02	0.01	99.1	Analog	0.30	3
3	Sc		719,526.15	0.58	104.6	Pulse	0.30	3
3	Ge		447,858.23	0.26	105.7	Pulse	0.30	3
3	Ge		676,749.68	0.27	106.7	Pulse	0.30	3
3	Rh		6,939,902.64	1.95	109.1	Analog	0.30	3
3	Tb		11,793,342.59	0.09	109.5	Analog	0.30	3

Quantitation Report

File Name	033_CCV.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 12:50
Sample Name	CCVA
Sample Type	CCV
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	51.301	ug/l	0.69	341,182.28	1.091E-01	Pulse	0.25	3
B			1	110.249	ug/l	0.91	528,074.13	1.689E-01	Pulse	0.15	3
Ca			1	5057.379	ug/l	2.16	4,540,810.66	6.660E-01	Pulse	0.10	3
Sr			1	51.260	ug/l	1.27	2,556,560.90	2.565E-01	Pulse	0.10	3
Mo			1	50.945	ug/l	1.51	475,564.37	4.772E-02	Pulse	0.10	3
Ag			1	50.140	ug/l	2.13	1,221,651.15	1.182E-01	Pulse	0.10	3
Sn			1	49.694	ug/l	1.28	769,088.87	7.439E-02	Pulse	0.10	3
Sb			1	51.748	ug/l	1.94	947,426.00	6.052E-02	Pulse	0.10	3
Ba			1	50.565	ug/l	1.58	389,958.43	2.491E-02	Pulse	0.10	3
Tl			1	50.133	ug/l	1.98	2,642,309.39	2.701E-01	Pulse	0.10	3
Pb			1	50.763	ug/l	1.89	914,718.11	9.349E-02	Pulse	0.10	3
Pb			1	50.799	ug/l	1.13	803,616.89	8.213E-02	Pulse	0.10	3
Pb			1	50.691	ug/l	1.53	3,676,703.51	3.758E-01	Pulse	0.10	3
Na			2	5042.995	ug/l	0.45	7,971,619.13	1.811E+01	Analog	0.30	3
Mg			2	4824.909	ug/l	0.58	3,696,024.85	8.394E+00	Pulse	0.30	3
Al			2	4829.355	ug/l	0.90	1,245,244.57	2.828E+00	Pulse	0.30	3
K			2	4953.128	ug/l	0.85	2,722,947.46	6.184E+00	Pulse	0.30	3
Ca			2	5158.271	ug/l	0.84	152,150.52	3.456E-01	Pulse	0.30	3
Ti			2	49.033	ug/l	0.85	10,998.21	2.498E-02	Pulse	0.30	3
V			2	50.053	ug/l	0.67	377,933.58	8.584E-01	Pulse	0.30	3
Cr			2	49.176	ug/l	0.38	482,694.65	1.096E+00	Pulse	0.30	3
Mn			2	48.674	ug/l	0.39	256,695.49	5.830E-01	Pulse	0.30	3
Fe			2	4891.650	ug/l	0.13	37,142,319.64	8.436E+01	Analog	0.30	3
Co			2	49.328	ug/l	0.43	776,715.48	1.764E+00	Pulse	0.30	3
Ni			2	48.741	ug/l	0.82	205,739.69	4.673E-01	Pulse	0.30	3
Cu			2	47.651	ug/l	1.02	569,029.06	1.292E+00	Pulse	0.30	3
Zn			2	47.544	ug/l	1.06	85,289.89	1.937E-01	Pulse	0.30	3
As			2	49.772	ug/l	1.05	45,168.76	1.026E-01	Pulse	1.00	3
Cd			2	49.186	ug/l	0.57	132,309.59	5.030E-02	Pulse	0.30	3
Sn			2	49.922	ug/l	0.18	263,968.53	1.004E-01	Pulse	0.30	3
Se			3	201.856	ug/l	0.86	58,248.55	8.225E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,125,993.29	0.39	97.5	Pulse	0.10	3
1	Sc		6,819,887.19	1.46	106.4	Analog	0.10	3
1	Ge		1,351,081.85	1.49	108.6	Pulse	0.10	3

Quantitation Report

1	Ge		1,899,912.26	1.96	109.3	Pulse	0.10	3
1	Rh		9,965,752.14	0.30	103.2	Analog	0.10	3
1	In		10,338,443.91	0.45	105.5	Analog	0.10	3
1	Tb		15,652,978.10	0.69	105.1	Analog	0.10	3
1	Ho		16,017,616.84	1.03	106.6	Analog	0.10	3
1	Bi		9,784,704.85	0.36	100.6	Analog	0.10	3
2	Sc		440,300.21	0.49	110.7	Pulse	0.30	3
2	Ge		273,369.21	0.38	113.8	Pulse	0.30	3
2	Ge		408,114.38	1.04	112.4	Pulse	0.30	3
2	Rh		7,156,240.83	0.96	106.1	Analog	0.30	3
2	In		2,630,314.30	0.51	108.4	Pulse	0.30	3
2	Tb		9,768,831.56	0.82	105.1	Analog	0.30	3
2	Ho		10,024,995.43	0.42	105.1	Analog	0.30	3
2	Bi		6,598,861.13	0.32	100.0	Analog	0.30	3
3	Sc		761,102.85	0.63	110.7	Pulse	0.30	3
3	Ge		469,633.56	1.28	110.8	Pulse	0.30	3
3	Ge		708,205.48	1.06	111.6	Pulse	0.30	3
3	Rh		6,930,994.03	1.10	108.9	Analog	0.30	3
3	Tb		11,876,863.97	1.62	110.2	Analog	0.30	3

Quantitation Report

File Name	034_CCB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 12:55
Sample Name	CCB
Sample Type	CCB
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.001	ug/l	459.85	42.67	1.347E-05	Pulse	0.25	3
B			1	3.212	ug/l	2.22	17,716.19	5.572E-03	Pulse	0.15	3
Ca			1	0.269	ug/l	117.65	8,402.43	1.236E-03	Pulse	0.10	3
Sr			1	0.005	ug/l	33.79	773.39	7.595E-05	Pulse	0.10	3
Mo			1	0.152	ug/l	15.92	1,510.13	1.483E-04	Pulse	0.10	3
Ag			1	0.011	ug/l	30.59	276.68	2.678E-05	Pulse	0.10	3
Sn			1	0.230	ug/l	13.16	4,700.90	4.551E-04	Pulse	0.10	3
Sb			1	0.559	ug/l	4.45	6,128.11	3.925E-04	Pulse	0.10	3
Ba			1	0.010	ug/l	39.51	96.67	6.185E-06	Pulse	0.10	3
Tl			1	0.012	ug/l	10.60	630.04	6.292E-05	Pulse	0.10	3
Pb			1	0.008	ug/l	30.50	390.02	3.894E-05	Pulse	0.10	3
Pb			1	0.004	ug/l	32.68	396.69	3.961E-05	Pulse	0.10	3
Pb			1	0.006	ug/l	18.28	1,746.78	1.744E-04	Pulse	0.10	3
Na			2	1.044	ug/l	14.71	13,994.78	3.223E-02	Pulse	0.30	3
Mg			2	0.287	ug/l	11.11	276.67	6.373E-04	Pulse	0.30	3
Al			2	0.359	ug/l	20.59	153.34	3.532E-04	Pulse	0.30	3
K			2	0.220	ug/l	166.27	13,304.27	3.064E-02	Pulse	0.30	3
Ca			2	-1.657	ug/l	-7.14	65.55	1.509E-04	Pulse	0.30	3
Ti			2	-0.035	ug/l	-91.56	17.78	4.101E-05	Pulse	0.30	3
V			2	0.005	ug/l	54.74	220.00	5.069E-04	Pulse	0.30	3
Cr			2	0.005	ug/l	17.48	462.24	1.065E-03	Pulse	0.30	3
Mn			2	0.140	ug/l	7.04	195.56	4.506E-04	Pulse	0.30	3
Fe			2	1.567	ug/l	4.72	14,701.10	3.386E-02	Pulse	0.30	3
Co			2	0.001	ug/l	95.15	65.51	1.510E-04	Pulse	0.30	3
Ni			2	0.003	ug/l	120.76	55.55	1.280E-04	Pulse	0.30	3
Cu			2	-0.769	ug/l	-2.04	9,387.21	2.162E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	-0.164	ug/l	-2.90	168.89	3.890E-04	Pulse	0.30	3
As			2	-0.001	ug/l	-63.25	32.67	7.524E-05	Pulse	1.00	3
Cd			2	-0.001	ug/l	-209.53	19.81	7.646E-06	Pulse	0.30	3
Sn			2	0.494	ug/l	5.45	2,067.94	7.982E-04	Pulse	0.30	3
Se			3	0.084	ug/l	5.11	46.80	6.715E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,179,476.84	0.59	99.2	Pulse	0.10	3
1	Sc		6,796,887.40	0.46	106.0	Analog	0.10	3
1	Ge		1,343,454.62	0.33	108.0	Pulse	0.10	3
1	Ge		1,883,023.10	0.62	108.3	Pulse	0.10	3
1	Rh		10,171,040.27	1.81	105.4	Analog	0.10	3
1	In		10,329,978.42	0.05	105.4	Analog	0.10	3
1	Tb		15,614,502.27	0.55	104.8	Analog	0.10	3
1	Ho		15,743,541.02	0.76	104.8	Analog	0.10	3
1	Bi		10,018,446.72	0.87	103.0	Analog	0.10	3
2	Sc		434,179.50	0.61	109.2	Pulse	0.30	3
2	Ge		266,353.69	0.57	110.9	Pulse	0.30	3
2	Ge		401,466.23	0.68	110.5	Pulse	0.30	3
2	Rh		7,350,149.71	0.33	109.0	Analog	0.30	3
2	In		2,590,492.36	0.27	106.7	Pulse	0.30	3
2	Tb		9,765,382.11	0.89	105.1	Analog	0.30	3
2	Ho		9,981,030.71	0.55	104.7	Analog	0.30	3
2	Bi		6,866,283.20	0.14	104.1	Analog	0.30	3
3	Sc		749,596.90	0.98	109.0	Pulse	0.30	3
3	Ge		464,018.83	0.93	109.5	Pulse	0.30	3
3	Ge		696,932.07	0.44	109.8	Pulse	0.30	3
3	Rh		7,153,695.83	1.39	112.4	Analog	0.30	3
3	Tb		11,869,575.64	0.42	110.2	Analog	0.30	3

Quantitation Report

File Name	035SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 13:00
Sample Name	MP19193-MB1 1
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.000	ug/l	-684.64	32.00	9.923E-06	Pulse	0.25	3
B			1	1.840	ug/l	7.28	11,221.74	3.478E-03	Pulse	0.15	3
Ca			1	1.938	ug/l	16.46	10,300.22	1.456E-03	Pulse	0.10	3
Sr			1	0.006	ug/l	14.45	816.72	7.880E-05	Pulse	0.10	3
Mo			1	0.035	ug/l	37.12	403.36	3.890E-05	Pulse	0.10	3
Ag			1	0.006	ug/l	32.35	156.67	1.470E-05	Pulse	0.10	3
Sn			1	0.073	ug/l	15.85	2,350.26	2.206E-04	Pulse	0.10	3
Sb			1	0.383	ug/l	0.74	2,943.73	1.865E-04	Pulse	0.10	3
Ba			1	0.011	ug/l	57.89	103.34	6.564E-06	Pulse	0.10	3
Tl			1	0.004	ug/l	6.76	236.68	2.364E-05	Pulse	0.10	3
Pb			1	0.013	ug/l	17.16	480.03	4.794E-05	Pulse	0.10	3
Pb			1	0.004	ug/l	136.31	390.02	3.896E-05	Pulse	0.10	3
Pb			1	0.008	ug/l	18.13	1,883.46	1.881E-04	Pulse	0.10	3
Na			2	1.378	ug/l	28.24	14,419.57	3.343E-02	Pulse	0.30	3
Mg			2	0.435	ug/l	10.90	385.57	8.950E-04	Pulse	0.30	3
Al			2	1.610	ug/l	11.38	468.90	1.086E-03	Pulse	0.30	3
K			2	1.289	ug/l	59.86	13,795.83	3.197E-02	Pulse	0.30	3
Ca			2	0.702	ug/l	71.87	133.33	3.089E-04	Pulse	0.30	3
Ti			2	-0.054	ug/l	-60.89	13.33	3.125E-05	Pulse	0.30	3
V			2	0.002	ug/l	164.31	196.67	4.557E-04	Pulse	0.30	3
Cr			2	0.003	ug/l	101.56	441.12	1.022E-03	Pulse	0.30	3
Mn			2	0.134	ug/l	1.50	161.12	3.736E-04	Pulse	0.30	3
Fe			2	1.251	ug/l	1.80	12,266.90	2.841E-02	Pulse	0.30	3
Co			2	0.000	ug/l	36.04	53.30	1.234E-04	Pulse	0.30	3
Ni			2	0.007	ug/l	31.18	71.11	1.651E-04	Pulse	0.30	3
Cu			2	-0.763	ug/l	-4.46	9,393.87	2.178E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	-0.010	ug/l	-99.32	436.68	1.011E-03	Pulse	0.30	3
As			2	-0.009	ug/l	-102.18	25.33	5.913E-05	Pulse	1.00	3
Cd			2	-0.006	ug/l	-22.21	6.61	2.557E-06	Pulse	0.30	3
Sn			2	0.279	ug/l	1.37	944.49	3.655E-04	Pulse	0.30	3
Se			3	0.018	ug/l	33.40	28.13	4.020E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,226,307.63	0.25	100.7	Pulse	0.10	3
1	Sc		7,076,021.77	0.70	110.3	Analog	0.10	3
1	Ge		1,371,767.43	0.90	110.3	Pulse	0.10	3
1	Ge		1,915,314.50	0.65	110.2	Pulse	0.10	3
1	Rh		10,364,787.35	0.19	107.4	Analog	0.10	3
1	In		10,654,567.98	0.74	108.8	Analog	0.10	3
1	Tb		15,779,553.10	0.99	105.9	Analog	0.10	3
1	Ho		16,099,153.93	0.88	107.1	Analog	0.10	3
1	Bi		10,011,059.23	0.32	103.0	Analog	0.10	3
2	Sc		431,781.07	3.86	108.6	Pulse	0.30	3
2	Ge		267,887.07	1.61	111.6	Pulse	0.30	3
2	Ge		402,593.53	1.72	110.8	Pulse	0.30	3
2	Rh		7,319,591.93	3.58	108.5	Analog	0.30	3
2	In		2,585,645.96	3.38	106.6	Pulse	0.30	3
2	Tb		9,661,866.01	3.47	104.0	Analog	0.30	3
2	Ho		9,915,991.83	3.18	104.0	Analog	0.30	3
2	Bi		6,728,094.73	2.15	102.0	Analog	0.30	3
3	Sc		751,025.44	0.93	109.2	Pulse	0.30	3
3	Ge		465,340.23	0.72	109.8	Pulse	0.30	3
3	Ge		699,885.20	0.47	110.3	Pulse	0.30	3
3	Rh		7,119,594.44	1.18	111.9	Analog	0.30	3
3	Tb		11,838,513.14	0.83	109.9	Analog	0.30	3

Quantitation Report

File Name	036SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 13:05
Sample Name	MP19193-B1
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	71.070	ug/l	0.22	494,724.03	1.512E-01	Pulse	0.25	3
B			1	76.480	ug/l	0.83	384,115.96	1.174E-01	Pulse	0.15	3
Ca			1	1914.317	ug/l	1.23	1,772,314.14	2.528E-01	Pulse	0.10	3
Sr			1	71.034	ug/l	1.61	3,668,419.84	3.555E-01	Pulse	0.10	3
Mo			1	72.749	ug/l	1.77	703,213.85	6.814E-02	Pulse	0.10	3
Ag			1	74.196	ug/l	1.59	1,834,868.98	1.748E-01	Pulse	0.10	3
Sn			1	72.298	ug/l	1.41	1,135,172.92	1.082E-01	Pulse	0.10	3
Sb			1	74.572	ug/l	1.38	1,392,890.76	8.733E-02	Pulse	0.10	3
Ba			1	70.619	ug/l	2.12	554,908.65	3.479E-02	Pulse	0.10	3
Tl			1	70.223	ug/l	1.93	3,772,372.97	3.783E-01	Pulse	0.10	3
Pb			1	78.249	ug/l	2.76	1,436,982.58	1.441E-01	Pulse	0.10	3
Pb			1	78.257	ug/l	2.26	1,261,586.91	1.265E-01	Pulse	0.10	3
Pb			1	77.841	ug/l	2.14	5,753,621.42	5.770E-01	Pulse	0.10	3
Na			2	1861.216	ug/l	0.14	2,999,435.37	6.700E+00	Pulse	0.30	3
Mg			2	1825.998	ug/l	0.26	1,422,248.07	3.177E+00	Pulse	0.30	3
Al			2	1826.775	ug/l	0.99	478,970.36	1.070E+00	Pulse	0.30	3
K			2	1860.960	ug/l	0.52	1,048,699.37	2.343E+00	Pulse	0.30	3
Ca			2	2140.800	ug/l	0.39	64,272.31	1.436E-01	Pulse	0.30	3
Ti			2	70.850	ug/l	1.00	16,145.75	3.607E-02	Pulse	0.30	3
V			2	70.425	ug/l	0.31	540,586.65	1.208E+00	Pulse	0.30	3
Cr			2	69.486	ug/l	0.32	693,302.99	1.549E+00	Pulse	0.30	3
Mn			2	68.692	ug/l	0.34	368,563.47	8.233E-01	Pulse	0.30	3
Fe			2	1850.438	ug/l	1.41	14,287,525.54	3.192E+01	Analog	0.30	3
Co			2	69.137	ug/l	0.19	1,106,844.85	2.472E+00	Pulse	0.30	3
Ni			2	68.356	ug/l	0.91	293,350.07	6.553E-01	Pulse	0.30	3
Cu			2	67.692	ug/l	0.49	814,027.05	1.818E+00	Pulse	0.30	3
Zn			2	67.782	ug/l	0.99	123,431.84	2.757E-01	Pulse	0.30	3
As			2	71.749	ug/l	0.70	66,188.41	1.479E-01	Pulse	1.00	3
Cd			2	69.242	ug/l	1.38	189,226.48	7.081E-02	Pulse	0.30	3
Sn			2	72.529	ug/l	0.19	389,859.95	1.459E-01	Pulse	0.30	3
Se			3	190.135	ug/l	0.36	54,379.08	7.748E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,272,032.99	0.11	102.1	Pulse	0.10	3
1	Sc		7,009,880.31	0.30	109.3	Analog	0.10	3
1	Ge		1,387,771.75	1.60	111.5	Pulse	0.10	3

Quantitation Report

1	Ge		1,950,030.86	1.81	112.2	Pulse	0.10	3
1	Rh		10,319,938.39	0.13	106.9	Analog	0.10	3
1	In		10,493,318.20	0.82	107.1	Analog	0.10	3
1	Tb		15,949,098.93	0.79	107.0	Analog	0.10	3
1	Ho		16,125,046.84	0.32	107.3	Analog	0.10	3
1	Bi		9,972,352.56	0.60	102.6	Analog	0.10	3
2	Sc		447,673.25	0.16	112.6	Pulse	0.30	3
2	Ge		274,487.06	1.11	114.3	Pulse	0.30	3
2	Ge		414,108.95	0.23	114.0	Pulse	0.30	3
2	Rh		7,303,938.60	0.51	108.3	Analog	0.30	3
2	In		2,672,260.92	0.28	110.1	Pulse	0.30	3
2	Tb		9,872,951.55	0.20	106.3	Analog	0.30	3
2	Ho		10,041,769.04	1.09	105.3	Analog	0.30	3
2	Bi		6,829,331.54	1.37	103.5	Analog	0.30	3
3	Sc		751,716.53	0.92	109.3	Pulse	0.30	3
3	Ge		462,183.47	0.72	109.0	Pulse	0.30	3
3	Ge		701,856.97	0.30	110.6	Pulse	0.30	3
3	Rh		6,932,299.44	1.18	108.9	Analog	0.30	3
3	Tb		11,784,512.87	0.87	109.4	Analog	0.30	3

Quantitation Report

File Name	037SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 13:10
Sample Name	MP19193-S1
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	70.858	ug/l	1.78	493,270.38	1.507E-01	Pulse	0.25	3
B			1	79.690	ug/l	1.83	400,153.99	1.223E-01	Pulse	0.15	3
Ca			1	225.456	ug/l	0.86	208,605.89	3.084E-02	Pulse	0.10	3
Sr			1	77.580	ug/l	1.48	3,871,664.84	3.882E-01	Pulse	0.10	3
Mo			1	0.208	ug/l	18.71	2,000.22	2.003E-04	Pulse	0.10	3
Ag			1	0.009	ug/l	20.82	236.68	2.292E-05	Pulse	0.10	3
Sn			1	0.231	ug/l	7.63	4,717.57	4.565E-04	Pulse	0.10	3
Sb			1	0.427	ug/l	3.02	3,670.57	2.380E-04	Pulse	0.10	3
Ba			1	128.323	ug/l	1.60	975,138.08	6.322E-02	Pulse	0.10	3
Tl			1	68.868	ug/l	2.36	3,702,717.03	3.710E-01	Pulse	0.10	3
Pb			1	77.635	ug/l	1.78	1,426,928.21	1.430E-01	Pulse	0.10	3
Pb			1	77.026	ug/l	2.13	1,242,802.77	1.245E-01	Pulse	0.10	3
Pb			1	77.121	ug/l	1.97	5,705,325.10	5.716E-01	Pulse	0.10	3
Na			2	1821.364	ug/l	0.41	2,837,914.20	6.557E+00	Pulse	0.30	3
Mg			2	727.720	ug/l	0.92	548,014.96	1.266E+00	Pulse	0.30	3
Al			2	8.138	ug/l	1.05	2,124.61	4.909E-03	Pulse	0.30	3
K			2	666.152	ug/l	1.56	371,336.05	8.580E-01	Pulse	0.30	3
Ca			2	513.670	ug/l	2.82	14,993.55	3.465E-02	Pulse	0.30	3
Ti			2	0.021	ug/l	330.02	30.00	6.941E-05	Pulse	0.30	3
V			2	70.593	ug/l	1.46	523,839.13	1.210E+00	Pulse	0.30	3
Cr			2	69.587	ug/l	1.22	671,212.72	1.551E+00	Pulse	0.30	3
Mn			2	74.453	ug/l	1.58	386,221.62	8.924E-01	Pulse	0.30	3
Fe			2	9.691	ug/l	2.20	75,277.07	1.739E-01	Pulse	0.30	3
Co			2	70.166	ug/l	1.13	1,085,947.22	2.509E+00	Pulse	0.30	3
Ni			2	69.750	ug/l	0.95	289,380.07	6.686E-01	Pulse	0.30	3
Cu			2	92.258	ug/l	1.09	1,065,975.03	2.463E+00	Pulse	0.30	3
Zn			2	74.464	ug/l	0.97	131,044.76	3.028E-01	Pulse	0.30	3
As			2	0.032	ug/l	19.88	62.33	1.440E-04	Pulse	1.00	3
Cd			2	69.823	ug/l	0.46	189,960.11	7.140E-02	Pulse	0.30	3
Sn			2	0.446	ug/l	4.74	1,870.14	7.027E-04	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	81.102	ug/l	1.06	22,767.50	3.307E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,272,254.16	0.75	102.1	Pulse	0.10	3
1	Sc		6,764,846.36	0.82	105.5	Analog	0.10	3
1	Ge		1,349,950.97	1.91	108.5	Pulse	0.10	3
1	Ge		1,887,774.97	2.50	108.6	Pulse	0.10	3
1	Rh		9,971,676.10	1.39	103.3	Analog	0.10	3
1	In		10,331,239.26	0.65	105.5	Analog	0.10	3
1	Tb		15,424,599.77	0.84	103.5	Analog	0.10	3
1	Ho		15,709,203.52	0.90	104.5	Analog	0.10	3
1	Bi		9,980,711.10	0.21	102.6	Analog	0.10	3
2	Sc		432,800.98	0.72	108.8	Pulse	0.30	3
2	Ge		270,732.74	0.45	112.7	Pulse	0.30	3
2	Ge		406,716.46	0.22	112.0	Pulse	0.30	3
2	Rh		7,204,103.60	0.74	106.8	Analog	0.30	3
2	In		2,660,435.41	0.92	109.6	Pulse	0.30	3
2	Tb		9,657,924.62	0.65	103.9	Analog	0.30	3
2	Ho		9,982,645.44	0.16	104.7	Analog	0.30	3
2	Bi		6,806,870.84	0.51	103.2	Analog	0.30	3
3	Sc		723,195.70	1.11	105.2	Pulse	0.30	3
3	Ge		455,073.91	1.10	107.4	Pulse	0.30	3
3	Ge		688,550.75	0.92	108.5	Pulse	0.30	3
3	Rh		6,825,804.04	2.26	107.3	Analog	0.30	3
3	Tb		11,558,734.26	1.38	107.3	Analog	0.30	3

Quantitation Report

File Name	038SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 13:14
Sample Name	MP19193-S2
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	70.301	ug/l	0.80	497,922.83	1.496E-01	Pulse	0.25	3
B			1	80.061	ug/l	1.16	408,989.60	1.229E-01	Pulse	0.15	3
Ca			1	221.710	ug/l	0.71	210,588.25	3.034E-02	Pulse	0.10	3
Sr			1	78.463	ug/l	1.49	3,928,786.82	3.926E-01	Pulse	0.10	3
Mo			1	0.103	ug/l	4.41	1,026.73	1.026E-04	Pulse	0.10	3
Ag			1	0.009	ug/l	33.59	230.03	2.220E-05	Pulse	0.10	3
Sn			1	0.085	ug/l	15.35	2,453.63	2.374E-04	Pulse	0.10	3
Sb			1	0.327	ug/l	1.94	1,866.84	1.204E-04	Pulse	0.10	3
Ba			1	128.887	ug/l	2.35	985,026.26	6.349E-02	Pulse	0.10	3
Tl			1	68.250	ug/l	2.06	3,677,561.72	3.677E-01	Pulse	0.10	3
Pb			1	77.336	ug/l	1.91	1,424,589.15	1.424E-01	Pulse	0.10	3
Pb			1	77.404	ug/l	1.78	1,251,658.11	1.251E-01	Pulse	0.10	3
Pb			1	77.209	ug/l	1.64	5,724,467.83	5.723E-01	Pulse	0.10	3
Na			2	1815.086	ug/l	1.08	2,839,785.79	6.535E+00	Pulse	0.30	3
Mg			2	728.174	ug/l	1.01	550,604.39	1.267E+00	Pulse	0.30	3
Al			2	7.953	ug/l	4.38	2,085.71	4.800E-03	Pulse	0.30	3
K			2	668.126	ug/l	1.39	373,939.49	8.605E-01	Pulse	0.30	3
Ca			2	512.583	ug/l	1.74	15,025.78	3.457E-02	Pulse	0.30	3
Ti			2	0.025	ug/l	207.14	31.11	7.156E-05	Pulse	0.30	3
V			2	70.910	ug/l	0.97	528,379.70	1.216E+00	Pulse	0.30	3
Cr			2	69.524	ug/l	1.52	673,364.07	1.550E+00	Pulse	0.30	3
Mn			2	74.615	ug/l	0.52	388,690.15	8.944E-01	Pulse	0.30	3
Fe			2	9.263	ug/l	0.32	72,392.18	1.666E-01	Pulse	0.30	3
Co			2	70.759	ug/l	0.97	1,099,678.06	2.530E+00	Pulse	0.30	3
Ni			2	70.329	ug/l	0.55	293,000.81	6.742E-01	Pulse	0.30	3
Cu			2	93.062	ug/l	1.52	1,079,574.85	2.484E+00	Pulse	0.30	3
Zn			2	75.632	ug/l	1.18	133,641.17	3.075E-01	Pulse	0.30	3
As			2	0.032	ug/l	36.63	62.00	1.428E-04	Pulse	1.00	3
Cd			2	69.085	ug/l	0.58	189,021.20	7.065E-02	Pulse	0.30	3
Sn			2	0.257	ug/l	0.65	861.15	3.219E-04	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	81.237	ug/l	0.43	22,638.98	3.312E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,329,113.78	1.20	103.9	Pulse	0.10	3
1	Sc		6,940,439.48	1.08	108.2	Analog	0.10	3
1	Ge		1,373,354.30	1.05	110.4	Pulse	0.10	3
1	Ge		1,915,513.67	1.81	110.2	Pulse	0.10	3
1	Rh		10,006,143.18	0.23	103.7	Analog	0.10	3
1	In		10,330,554.37	1.42	105.4	Analog	0.10	3
1	Tb		15,515,330.60	0.78	104.1	Analog	0.10	3
1	Ho		15,700,461.02	0.97	104.5	Analog	0.10	3
1	Bi		10,002,556.31	0.50	102.9	Analog	0.10	3
2	Sc		434,595.37	0.83	109.3	Pulse	0.30	3
2	Ge		273,227.20	1.29	113.8	Pulse	0.30	3
2	Ge		411,279.19	0.34	113.2	Pulse	0.30	3
2	Rh		7,170,138.33	0.72	106.3	Analog	0.30	3
2	In		2,675,523.66	0.25	110.3	Pulse	0.30	3
2	Tb		9,640,571.28	1.20	103.8	Analog	0.30	3
2	Ho		9,911,270.72	0.62	103.9	Analog	0.30	3
2	Bi		6,839,760.28	0.89	103.7	Analog	0.30	3
3	Sc		714,440.51	1.02	103.9	Pulse	0.30	3
3	Ge		450,849.86	1.32	106.4	Pulse	0.30	3
3	Ge		683,504.71	0.82	107.7	Pulse	0.30	3
3	Rh		6,846,423.48	1.02	107.6	Analog	0.30	3
3	Tb		11,525,991.21	1.46	107.0	Analog	0.30	3

Quantitation Report

File Name	039SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 13:19
Sample Name	JD1295-1
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.022	ug/l	29.24	188.00	5.675E-05	Pulse	0.25	3
B			1	9.597	ug/l	0.41	50,813.78	1.532E-02	Pulse	0.15	3
Ca			1	207.115	ug/l	2.07	196,982.73	2.842E-02	Pulse	0.10	3
Sr			1	6.879	ug/l	0.71	350,159.34	3.447E-02	Pulse	0.10	3
Mo			1	0.031	ug/l	18.63	350.02	3.444E-05	Pulse	0.10	3
Ag			1	0.003	ug/l	70.29	90.00	8.631E-06	Pulse	0.10	3
Sn			1	0.027	ug/l	82.06	1,583.46	1.516E-04	Pulse	0.10	3
Sb			1	0.285	ug/l	6.87	1,100.08	7.122E-05	Pulse	0.10	3
Ba			1	56.766	ug/l	0.53	432,090.33	2.797E-02	Pulse	0.10	3
Tl			1	0.033	ug/l	5.22	1,783.51	1.774E-04	Pulse	0.10	3
Pb			1	0.674	ug/l	2.06	12,712.56	1.265E-03	Pulse	0.10	3
Pb			1	0.652	ug/l	3.59	10,924.47	1.087E-03	Pulse	0.10	3
Pb			1	0.650	ug/l	0.73	49,714.31	4.946E-03	Pulse	0.10	3
Na			2	1822.095	ug/l	0.61	2,860,180.17	6.560E+00	Pulse	0.30	3
Mg			2	727.291	ug/l	0.31	551,760.78	1.265E+00	Pulse	0.30	3
Al			2	7.433	ug/l	1.74	1,960.14	4.496E-03	Pulse	0.30	3
K			2	664.933	ug/l	0.65	373,454.22	8.565E-01	Pulse	0.30	3
Ca			2	227.095	ug/l	2.87	6,742.55	1.546E-02	Pulse	0.30	3
Ti			2	0.015	ug/l	381.78	28.89	6.625E-05	Pulse	0.30	3
V			2	0.000	ug/l	-1971.36	185.56	4.256E-04	Pulse	0.30	3
Cr			2	0.072	ug/l	6.11	1,120.05	2.569E-03	Pulse	0.30	3
Mn			2	5.202	ug/l	1.38	26,686.15	6.120E-02	Pulse	0.30	3
Fe			2	6.840	ug/l	1.62	54,413.63	1.248E-01	Pulse	0.30	3
Co			2	0.333	ug/l	0.57	5,247.43	1.203E-02	Pulse	0.30	3
Ni			2	0.577	ug/l	6.60	2,454.66	5.630E-03	Pulse	0.30	3
Cu			2	22.355	ug/l	1.25	274,044.51	6.285E-01	Pulse	0.30	3
Zn			2	3.374	ug/l	1.18	6,420.22	1.472E-02	Pulse	0.30	3
As			2	0.011	ug/l	23.77	43.33	9.939E-05	Pulse	1.00	3
Cd			2	0.028	ug/l	9.71	96.62	3.655E-05	Pulse	0.30	3
Sn			2	0.221	ug/l	4.79	658.91	2.492E-04	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	0.124	ug/l	11.40	56.73	8.334E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,317,365.97	0.88	103.5	Pulse	0.10	3
1	Sc		6,930,610.94	1.30	108.1	Analog	0.10	3
1	Ge		1,366,102.27	1.01	109.8	Pulse	0.10	3
1	Ge		1,909,587.42	0.81	109.9	Pulse	0.10	3
1	Rh		10,157,808.60	0.77	105.2	Analog	0.10	3
1	In		10,458,253.96	1.53	106.8	Analog	0.10	3
1	Tb		15,450,889.77	0.67	103.7	Analog	0.10	3
1	Ho		15,568,563.10	1.45	103.6	Analog	0.10	3
1	Bi		10,050,666.52	1.01	103.4	Analog	0.10	3
2	Sc		436,012.79	0.11	109.6	Pulse	0.30	3
2	Ge		269,831.40	0.34	112.4	Pulse	0.30	3
2	Ge		408,710.32	0.09	112.5	Pulse	0.30	3
2	Rh		7,311,675.26	0.24	108.4	Analog	0.30	3
2	In		2,644,090.57	0.88	109.0	Pulse	0.30	3
2	Tb		9,784,137.39	1.03	105.3	Analog	0.30	3
2	Ho		10,044,309.60	0.54	105.3	Analog	0.30	3
2	Bi		6,899,732.23	0.68	104.6	Analog	0.30	3
3	Sc		720,074.47	0.67	104.7	Pulse	0.30	3
3	Ge		452,271.63	0.92	106.7	Pulse	0.30	3
3	Ge		680,994.04	0.98	107.3	Pulse	0.30	3
3	Rh		6,814,589.73	0.20	107.1	Analog	0.30	3
3	Tb		11,508,322.04	0.58	106.8	Analog	0.30	3

Quantitation Report

File Name	040SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 13:24
Sample Name	JD1295-2
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.002	ug/l	129.97	48.00	1.456E-05	Pulse	0.25	3
B			1	6.830	ug/l	3.25	36,557.39	1.109E-02	Pulse	0.15	3
Ca			1	22581.929	ug/l	1.29	20,162,736.37	2.969E+00	Analog	0.10	3
Sr			1	17.831	ug/l	1.01	879,848.50	8.927E-02	Pulse	0.10	3
Mo			1	0.030	ug/l	6.82	330.02	3.349E-05	Pulse	0.10	3
Ag			1	0.002	ug/l	26.70	73.33	7.169E-06	Pulse	0.10	3
Sn			1	0.024	ug/l	5.53	1,506.79	1.471E-04	Pulse	0.10	3
Sb			1	0.277	ug/l	0.15	936.73	6.132E-05	Pulse	0.10	3
Ba			1	40.850	ug/l	2.24	307,402.23	2.013E-02	Pulse	0.10	3
Tl			1	0.012	ug/l	9.14	650.04	6.687E-05	Pulse	0.10	3
Pb			1	0.021	ug/l	21.16	610.03	6.279E-05	Pulse	0.10	3
Pb			1	0.007	ug/l	101.75	426.69	4.387E-05	Pulse	0.10	3
Pb			1	0.014	ug/l	9.68	2,260.15	2.326E-04	Pulse	0.10	3
Na			2	1790.850	ug/l	0.28	2,758,211.21	6.448E+00	Pulse	0.30	3
Mg			2	934.657	ug/l	0.48	695,664.41	1.626E+00	Pulse	0.30	3
Al			2	3.756	ug/l	6.43	1,002.27	2.343E-03	Pulse	0.30	3
K			2	647.026	ug/l	0.67	356,883.56	8.343E-01	Pulse	0.30	3
Ca			2	22192.054	ug/l	0.39	635,596.50	1.486E+00	Pulse	0.30	3
Ti			2	-0.039	ug/l	-68.69	16.66	3.896E-05	Pulse	0.30	3
V			2	0.074	ug/l	10.30	728.92	1.704E-03	Pulse	0.30	3
Cr			2	0.055	ug/l	13.68	933.37	2.182E-03	Pulse	0.30	3
Mn			2	0.193	ug/l	5.33	461.12	1.078E-03	Pulse	0.30	3
Fe			2	0.996	ug/l	1.53	10,273.28	2.402E-02	Pulse	0.30	3
Co			2	0.018	ug/l	15.13	326.64	7.637E-04	Pulse	0.30	3
Ni			2	0.174	ug/l	6.65	754.47	1.764E-03	Pulse	0.30	3
Cu			2	-1.321	ug/l	-1.10	3,061.44	7.156E-03	Pulse	0.30	3
Zn			2	6.979	ug/l	1.18	12,548.27	2.933E-02	Pulse	0.30	3
As			2	0.017	ug/l	32.40	47.67	1.114E-04	Pulse	1.00	3
Cd			2	0.012	ug/l	55.52	53.30	2.062E-05	Pulse	0.30	3
Sn			2	0.197	ug/l	3.58	516.68	1.996E-04	Pulse	0.30	3
Se			3	0.027	ug/l	59.74	28.93	4.381E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,294,601.33	0.86	102.8	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		6,790,508.44	0.75	105.9	Analog	0.10	3
1	Ge		1,327,768.16	0.55	106.7	Pulse	0.10	3
1	Ge		1,855,430.60	1.01	106.7	Pulse	0.10	3
1	Rh		9,856,196.52	0.75	102.1	Analog	0.10	3
1	In		10,239,078.16	1.66	104.5	Analog	0.10	3
1	Tb		15,276,994.77	1.23	102.5	Analog	0.10	3
1	Ho		15,555,013.94	0.95	103.5	Analog	0.10	3
1	Bi		9,717,912.98	0.59	99.9	Analog	0.10	3
2	Sc		427,774.13	0.16	107.6	Pulse	0.30	3
2	Ge		262,881.22	1.32	109.5	Pulse	0.30	3
2	Ge		396,313.03	0.24	109.1	Pulse	0.30	3
2	Rh		6,951,934.58	1.12	103.1	Analog	0.30	3
2	In		2,587,089.67	1.36	106.6	Pulse	0.30	3
2	Tb		9,588,009.90	0.80	103.2	Analog	0.30	3
2	Ho		9,839,775.16	0.59	103.2	Analog	0.30	3
2	Bi		6,622,715.29	0.83	100.4	Analog	0.30	3
3	Sc		700,575.09	1.22	101.9	Pulse	0.30	3
3	Ge		439,185.49	0.99	103.6	Pulse	0.30	3
3	Ge		661,082.82	1.35	104.2	Pulse	0.30	3
3	Rh		6,587,725.02	1.14	103.5	Analog	0.30	3
3	Tb		11,418,240.93	1.04	106.0	Analog	0.30	3

Quantitation Report

File Name	041SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 13:29
Sample Name	JD1295-3
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.006	ug/l	14.71	77.33	2.398E-05	Pulse	0.25	3
B			1	3.297	ug/l	4.75	18,388.11	5.702E-03	Pulse	0.15	3
Ca			1	22418.956	ug/l	1.90	19,430,245.54	2.948E+00	Analog	0.10	3
Sr			1	17.960	ug/l	0.79	862,724.34	8.991E-02	Pulse	0.10	3
Mo			1	0.019	ug/l	37.95	223.34	2.327E-05	Pulse	0.10	3
Ag			1	0.001	ug/l	35.08	46.67	4.671E-06	Pulse	0.10	3
Sn			1	-0.008	ug/l	-44.13	990.07	9.916E-05	Pulse	0.10	3
Sb			1	0.272	ug/l	2.82	843.39	5.619E-05	Pulse	0.10	3
Ba			1	37.417	ug/l	0.60	276,683.79	1.843E-02	Pulse	0.10	3
Tl			1	0.007	ug/l	10.74	343.35	3.585E-05	Pulse	0.10	3
Pb			1	0.020	ug/l	24.05	576.70	6.021E-05	Pulse	0.10	3
Pb			1	0.014	ug/l	39.18	533.36	5.571E-05	Pulse	0.10	3
Pb			1	0.015	ug/l	16.15	2,270.15	2.371E-04	Pulse	0.10	3
Na			2	1800.856	ug/l	0.73	2,689,344.61	6.484E+00	Pulse	0.30	3
Mg			2	934.889	ug/l	1.04	674,696.17	1.627E+00	Pulse	0.30	3
Al			2	6.206	ug/l	7.84	1,566.76	3.777E-03	Pulse	0.30	3
K			2	654.606	ug/l	1.35	349,937.79	8.437E-01	Pulse	0.30	3
Ca			2	21933.139	ug/l	1.02	609,119.78	1.468E+00	Pulse	0.30	3
Ti			2	-0.068	ug/l	-23.41	10.00	2.411E-05	Pulse	0.30	3
V			2	0.014	ug/l	9.89	277.78	6.698E-04	Pulse	0.30	3
Cr			2	0.031	ug/l	23.15	682.25	1.645E-03	Pulse	0.30	3
Mn			2	0.204	ug/l	1.67	501.13	1.208E-03	Pulse	0.30	3
Fe			2	0.885	ug/l	3.24	9,170.44	2.211E-02	Pulse	0.30	3
Co			2	0.022	ug/l	13.87	369.99	8.925E-04	Pulse	0.30	3
Ni			2	0.165	ug/l	3.19	696.69	1.680E-03	Pulse	0.30	3
Cu			2	-1.345	ug/l	-0.99	2,700.26	6.511E-03	Pulse	0.30	3
Zn			2	6.321	ug/l	0.60	11,061.62	2.667E-02	Pulse	0.30	3
As			2	0.019	ug/l	61.11	48.33	1.165E-04	Pulse	1.00	3
Cd			2	-0.006	ug/l	-12.26	5.54	2.172E-06	Pulse	0.30	3
Sn			2	0.176	ug/l	3.21	404.45	1.589E-04	Pulse	0.30	3
Se			3	0.019	ug/l	7.22	26.13	4.045E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,225,926.79	1.00	100.7	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		6,590,824.49	1.05	102.8	Analog	0.10	3
1	Ge		1,298,179.62	1.06	104.3	Pulse	0.10	3
1	Ge		1,814,418.25	1.12	104.4	Pulse	0.10	3
1	Rh		9,594,925.90	0.51	99.4	Analog	0.10	3
1	In		9,983,371.66	0.45	101.9	Analog	0.10	3
1	Tb		15,009,299.78	0.13	100.7	Analog	0.10	3
1	Ho		15,234,096.85	0.10	101.4	Analog	0.10	3
1	Bi		9,574,361.94	0.73	98.5	Analog	0.10	3
2	Sc		414,795.62	0.75	104.3	Pulse	0.30	3
2	Ge		257,279.19	0.51	107.1	Pulse	0.30	3
2	Ge		386,729.43	0.68	106.5	Pulse	0.30	3
2	Rh		6,925,941.12	0.59	102.7	Analog	0.30	3
2	In		2,545,004.62	0.74	104.9	Pulse	0.30	3
2	Tb		9,466,982.40	0.47	101.9	Analog	0.30	3
2	Ho		9,656,090.45	1.29	101.3	Analog	0.30	3
2	Bi		6,643,859.32	0.87	100.7	Analog	0.30	3
3	Sc		687,037.09	0.63	99.9	Pulse	0.30	3
3	Ge		429,067.83	0.88	101.2	Pulse	0.30	3
3	Ge		646,033.91	0.41	101.8	Pulse	0.30	3
3	Rh		6,478,140.30	1.02	101.8	Analog	0.30	3
3	Tb		11,371,232.05	1.17	105.5	Analog	0.30	3

Quantitation Report

File Name	042SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 13:34
Sample Name	JD1295-4
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.017	ug/l	27.73	145.33	4.614E-05	Pulse	0.25	3
B			1	7.435	ug/l	0.78	37,887.12	1.202E-02	Pulse	0.15	3
Ca			1	21984.942	ug/l	0.82	18,499,949.31	2.891E+00	Analog	0.10	3
Sr			1	17.595	ug/l	1.23	820,007.49	8.809E-02	Pulse	0.10	3
Mo			1	0.020	ug/l	21.08	226.68	2.434E-05	Pulse	0.10	3
Ag			1	0.003	ug/l	99.14	73.34	7.605E-06	Pulse	0.10	3
Sn			1	0.008	ug/l	73.67	1,190.10	1.233E-04	Pulse	0.10	3
Sb			1	0.260	ug/l	2.14	606.70	4.140E-05	Pulse	0.10	3
Ba			1	57.373	ug/l	1.89	414,459.85	2.827E-02	Pulse	0.10	3
Tl			1	0.015	ug/l	7.66	776.72	8.304E-05	Pulse	0.10	3
Pb			1	0.475	ug/l	1.44	8,402.76	8.982E-04	Pulse	0.10	3
Pb			1	0.421	ug/l	2.64	6,671.72	7.133E-04	Pulse	0.10	3
Pb			1	0.442	ug/l	1.10	31,824.54	3.402E-03	Pulse	0.10	3
Na			2	1825.236	ug/l	0.63	2,639,112.26	6.571E+00	Pulse	0.30	3
Mg			2	953.137	ug/l	0.67	666,040.30	1.658E+00	Pulse	0.30	3
Al			2	3.985	ug/l	8.50	994.49	2.477E-03	Pulse	0.30	3
K			2	659.326	ug/l	0.95	341,195.15	8.496E-01	Pulse	0.30	3
Ca			2	21554.623	ug/l	0.18	579,617.48	1.443E+00	Pulse	0.30	3
Ti			2	-0.023	ug/l	-223.36	18.89	4.716E-05	Pulse	0.30	3
V			2	0.175	ug/l	2.05	1,377.85	3.431E-03	Pulse	0.30	3
Cr			2	0.066	ug/l	14.85	975.60	2.430E-03	Pulse	0.30	3
Mn			2	9.563	ug/l	0.95	45,603.82	1.136E-01	Pulse	0.30	3
Fe			2	23.825	ug/l	0.95	167,747.89	4.177E-01	Pulse	0.30	3
Co			2	0.318	ug/l	4.14	4,615.81	1.149E-02	Pulse	0.30	3
Ni			2	0.687	ug/l	3.38	2,682.48	6.680E-03	Pulse	0.30	3
Cu			2	30.981	ug/l	0.81	343,358.25	8.549E-01	Pulse	0.30	3
Zn			2	10.102	ug/l	1.37	16,864.37	4.199E-02	Pulse	0.30	3
As			2	0.013	ug/l	28.08	41.33	1.029E-04	Pulse	1.00	3
Cd			2	0.021	ug/l	21.51	73.32	2.975E-05	Pulse	0.30	3
Sn			2	0.199	ug/l	4.41	505.57	2.052E-04	Pulse	0.30	3
Se			3	0.012	ug/l	129.26	23.87	3.757E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,152,950.15	0.72	98.4	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		6,399,304.07	0.90	99.8	Analog	0.10	3
1	Ge		1,247,205.29	1.26	100.2	Pulse	0.10	3
1	Ge		1,749,419.09	0.68	100.6	Pulse	0.10	3
1	Rh		9,309,560.07	0.57	96.4	Analog	0.10	3
1	In		9,658,960.02	0.69	98.6	Analog	0.10	3
1	Tb		14,663,746.45	0.79	98.4	Analog	0.10	3
1	Ho		14,808,459.78	0.89	98.5	Analog	0.10	3
1	Bi		9,354,741.11	0.93	96.2	Analog	0.10	3
2	Sc		401,631.24	0.75	101.0	Pulse	0.30	3
2	Ge		249,375.63	0.51	103.8	Pulse	0.30	3
2	Ge		374,575.18	0.92	103.1	Pulse	0.30	3
2	Rh		6,663,755.85	1.02	98.8	Analog	0.30	3
2	In		2,464,308.15	0.22	101.6	Pulse	0.30	3
2	Tb		9,223,019.63	1.36	99.3	Analog	0.30	3
2	Ho		9,415,771.30	0.17	98.7	Analog	0.30	3
2	Bi		6,408,611.55	0.40	97.1	Analog	0.30	3
3	Sc		672,602.18	1.39	97.8	Pulse	0.30	3
3	Ge		423,404.84	1.41	99.9	Pulse	0.30	3
3	Ge		635,422.13	0.91	100.2	Pulse	0.30	3
3	Rh		6,404,031.41	1.04	100.6	Analog	0.30	3
3	Tb		11,239,123.16	2.04	104.3	Analog	0.30	3

Quantitation Report

File Name	043_CCV.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 13:39
Sample Name	CCVA
Sample Type	CCV
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	50.056	ug/l	1.44	320,212.78	1.065E-01	Pulse	0.25	3
B			1	104.797	ug/l	0.52	482,943.97	1.606E-01	Pulse	0.15	3
Ca			1	5005.848	ug/l	1.76	4,050,706.29	6.592E-01	Pulse	0.10	3
Sr			1	51.035	ug/l	1.28	2,287,755.18	2.554E-01	Pulse	0.10	3
Mo			1	50.678	ug/l	0.82	425,205.33	4.747E-02	Pulse	0.10	3
Ag			1	49.449	ug/l	1.81	1,093,369.52	1.165E-01	Pulse	0.10	3
Sn			1	49.504	ug/l	1.46	695,291.47	7.410E-02	Pulse	0.10	3
Sb			1	51.065	ug/l	2.23	861,301.03	5.972E-02	Pulse	0.10	3
Ba			1	49.235	ug/l	2.02	349,824.56	2.426E-02	Pulse	0.10	3
Tl			1	49.732	ug/l	2.81	2,417,166.16	2.679E-01	Pulse	0.10	3
Pb			1	50.910	ug/l	3.35	845,910.04	9.376E-02	Pulse	0.10	3
Pb			1	50.535	ug/l	2.51	737,225.87	8.171E-02	Pulse	0.10	3
Pb			1	50.646	ug/l	2.78	3,387,429.22	3.754E-01	Pulse	0.10	3
Na			2	5610.370	ug/l	10.29	7,285,554.71	2.014E+01	Analog	0.30	3
Mg			2	5351.018	ug/l	10.12	3,368,260.91	9.310E+00	Pulse	0.30	3
Al			2	5339.605	ug/l	9.79	1,131,592.56	3.127E+00	Pulse	0.30	3
K			2	5362.007	ug/l	10.23	2,421,228.03	6.692E+00	Pulse	0.30	3
Ca			2	5645.293	ug/l	11.34	136,714.37	3.782E-01	Pulse	0.30	3
Ti			2	52.736	ug/l	9.58	9,721.82	2.686E-02	Pulse	0.30	3
V			2	54.217	ug/l	10.90	336,211.22	9.297E-01	Pulse	0.30	3
Cr			2	53.412	ug/l	9.78	430,868.70	1.191E+00	Pulse	0.30	3
Mn			2	53.523	ug/l	10.37	231,949.10	6.412E-01	Pulse	0.30	3
Fe			2	5338.707	ug/l	11.16	33,287,688.68	9.207E+01	Analog	0.30	3
Co			2	53.024	ug/l	11.33	685,533.88	1.896E+00	Pulse	0.30	3
Ni			2	52.964	ug/l	10.63	183,647.19	5.078E-01	Pulse	0.30	3
Cu			2	52.221	ug/l	11.41	510,668.45	1.412E+00	Pulse	0.30	3
Zn			2	52.088	ug/l	10.05	76,751.83	2.121E-01	Pulse	0.30	3
As			2	54.022	ug/l	10.20	40,280.69	1.113E-01	Pulse	1.00	3
Cd			2	53.558	ug/l	10.88	121,486.77	5.477E-02	Pulse	0.30	3
Sn			2	54.099	ug/l	11.18	241,208.79	1.088E-01	Pulse	0.30	3
Se			3	203.696	ug/l	0.45	52,818.34	8.300E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,006,931.55	0.44	93.8	Pulse	0.10	3
1	Sc		6,145,368.87	1.00	95.8	Analog	0.10	3
1	Ge		1,197,340.53	2.50	96.2	Pulse	0.10	3

Quantitation Report

1	Ge		1,681,993.72	2.14	96.8	Pulse	0.10	3
1	Rh		8,957,014.24	1.17	92.8	Analog	0.10	3
1	In		9,382,508.14	1.10	95.8	Analog	0.10	3
1	Tb		14,421,923.95	0.25	96.8	Analog	0.10	3
1	Ho		14,624,672.70	1.21	97.3	Analog	0.10	3
1	Bi		9,024,475.28	1.23	92.8	Analog	0.10	3
2	Sc		364,105.96	9.39	91.5	Pulse	0.30	3
2	Ge		226,343.17	9.54	94.3	Pulse	0.30	3
2	Ge		340,587.01	10.12	93.8	Pulse	0.30	3
2	Rh		6,043,537.95	9.84	89.6	Analog	0.30	3
2	In		2,233,736.17	9.71	92.0	Pulse	0.30	3
2	Tb		8,494,435.77	9.50	91.4	Analog	0.30	3
2	Ho		8,688,248.54	8.77	91.1	Analog	0.30	3
2	Bi		5,781,458.24	10.38	87.6	Analog	0.30	3
3	Sc		676,509.50	0.88	98.4	Pulse	0.30	3
3	Ge		420,143.77	0.39	99.1	Pulse	0.30	3
3	Ge		636,352.23	0.56	100.3	Pulse	0.30	3
3	Rh		6,356,160.72	1.02	99.9	Analog	0.30	3
3	Tb		11,140,629.83	0.57	103.4	Analog	0.30	3

Quantitation Report

File Name	044_CCB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 13:44
Sample Name	CCB
Sample Type	CCB
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.004	ug/l	32.05	57.33	1.884E-05	Pulse	0.25	3
B			1	3.448	ug/l	2.25	18,047.67	5.932E-03	Pulse	0.15	3
Ca			1	0.866	ug/l	22.35	8,255.70	1.315E-03	Pulse	0.10	3
Sr			1	0.003	ug/l	20.86	626.71	6.716E-05	Pulse	0.10	3
Mo			1	0.132	ug/l	3.77	1,203.43	1.289E-04	Pulse	0.10	3
Ag			1	0.010	ug/l	36.30	246.68	2.556E-05	Pulse	0.10	3
Sn			1	0.243	ug/l	4.50	4,590.85	4.746E-04	Pulse	0.10	3
Sb			1	0.626	ug/l	0.90	6,865.10	4.720E-04	Pulse	0.10	3
Ba			1	0.008	ug/l	96.05	76.67	5.265E-06	Pulse	0.10	3
Tl			1	0.012	ug/l	16.57	590.04	6.229E-05	Pulse	0.10	3
Pb			1	0.019	ug/l	12.23	556.70	5.879E-05	Pulse	0.10	3
Pb			1	0.009	ug/l	23.02	440.03	4.649E-05	Pulse	0.10	3
Pb			1	0.012	ug/l	22.78	2,073.47	2.191E-04	Pulse	0.10	3
Na			2	1.394	ug/l	11.32	13,121.84	3.349E-02	Pulse	0.30	3
Mg			2	0.391	ug/l	2.37	321.12	8.195E-04	Pulse	0.30	3
Al			2	0.332	ug/l	42.16	132.22	3.375E-04	Pulse	0.30	3
K			2	1.339	ug/l	53.19	12,551.47	3.203E-02	Pulse	0.30	3
Ca			2	-0.229	ug/l	-526.84	96.67	2.466E-04	Pulse	0.30	3
Ti			2	-0.071	ug/l	-36.24	8.89	2.270E-05	Pulse	0.30	3
V			2	0.004	ug/l	107.18	191.11	4.878E-04	Pulse	0.30	3
Cr			2	0.003	ug/l	35.86	403.34	1.029E-03	Pulse	0.30	3
Mn			2	0.132	ug/l	1.05	136.67	3.488E-04	Pulse	0.30	3
Fe			2	1.519	ug/l	5.53	12,942.97	3.303E-02	Pulse	0.30	3
Co			2	0.001	ug/l	99.70	64.41	1.644E-04	Pulse	0.30	3
Ni			2	0.007	ug/l	82.20	64.44	1.645E-04	Pulse	0.30	3
Cu			2	-0.807	ug/l	-2.09	8,088.74	2.064E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	-0.143	ug/l	-14.32	185.56	4.736E-04	Pulse	0.30	3
As			2	0.005	ug/l	148.40	34.00	8.679E-05	Pulse	1.00	3
Cd			2	-0.001	ug/l	-244.57	17.60	7.363E-06	Pulse	0.30	3
Sn			2	0.488	ug/l	5.90	1,883.47	7.869E-04	Pulse	0.30	3
Se			3	0.084	ug/l	8.77	42.60	6.701E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,042,772.90	0.68	94.9	Pulse	0.10	3
1	Sc		6,279,024.91	0.77	97.9	Analog	0.10	3
1	Ge		1,215,428.86	0.97	97.7	Pulse	0.10	3
1	Ge		1,698,689.30	1.39	97.7	Pulse	0.10	3
1	Rh		9,336,334.86	1.34	96.7	Analog	0.10	3
1	In		9,673,630.54	1.14	98.7	Analog	0.10	3
1	Tb		14,544,530.20	1.09	97.6	Analog	0.10	3
1	Ho		14,826,336.03	1.18	98.7	Analog	0.10	3
1	Bi		9,465,302.98	0.80	97.3	Analog	0.10	3
2	Sc		391,831.48	0.21	98.5	Pulse	0.30	3
2	Ge		240,007.74	0.51	99.9	Pulse	0.30	3
2	Ge		364,810.18	0.96	100.4	Pulse	0.30	3
2	Rh		6,773,157.51	1.03	100.4	Analog	0.30	3
2	In		2,393,628.49	0.73	98.6	Pulse	0.30	3
2	Tb		9,207,448.52	0.48	99.1	Analog	0.30	3
2	Ho		9,458,847.12	1.80	99.2	Analog	0.30	3
2	Bi		6,480,601.55	0.61	98.2	Analog	0.30	3
3	Sc		681,963.36	0.35	99.2	Pulse	0.30	3
3	Ge		423,556.15	0.98	99.9	Pulse	0.30	3
3	Ge		635,852.65	0.50	100.2	Pulse	0.30	3
3	Rh		6,566,145.30	0.12	103.2	Analog	0.30	3
3	Tb		11,332,272.88	0.77	105.2	Analog	0.30	3

Quantitation Report

File Name	045SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 13:49
Sample Name	JD1295-5
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.036	ug/l	8.39	272.01	8.753E-05	Pulse	0.25	3
B			1	7.723	ug/l	1.30	38,704.58	1.246E-02	Pulse	0.15	3
Ca			1	553.497	ug/l	0.73	468,715.10	7.395E-02	Pulse	0.10	3
Sr			1	6.413	ug/l	1.98	303,057.40	3.214E-02	Pulse	0.10	3
Mo			1	0.087	ug/l	12.54	820.06	8.694E-05	Pulse	0.10	3
Ag			1	0.005	ug/l	18.99	126.67	1.307E-05	Pulse	0.10	3
Sn			1	0.137	ug/l	10.70	3,057.09	3.154E-04	Pulse	0.10	3
Sb			1	0.337	ug/l	1.74	1,953.53	1.320E-04	Pulse	0.10	3
Ba			1	24.477	ug/l	1.20	178,483.75	1.206E-02	Pulse	0.10	3
Tl			1	0.023	ug/l	18.94	1,183.43	1.235E-04	Pulse	0.10	3
Pb			1	1.943	ug/l	2.30	34,504.46	3.602E-03	Pulse	0.10	3
Pb			1	1.881	ug/l	2.35	29,440.29	3.073E-03	Pulse	0.10	3
Pb			1	1.874	ug/l	2.17	134,292.90	1.402E-02	Pulse	0.10	3
Na			2	2561.470	ug/l	0.68	3,696,955.83	9.210E+00	Pulse	0.30	3
Mg			2	519.218	ug/l	0.64	362,652.59	9.035E-01	Pulse	0.30	3
Al			2	813.512	ug/l	0.50	191,294.83	4.765E-01	Pulse	0.30	3
K			2	822.062	ug/l	0.39	422,184.76	1.052E+00	Pulse	0.30	3
Ca			2	561.996	ug/l	2.08	15,204.83	3.788E-02	Pulse	0.30	3
Ti			2	-0.006	ug/l	-161.13	22.22	5.539E-05	Pulse	0.30	3
V			2	0.040	ug/l	9.01	450.02	1.121E-03	Pulse	0.30	3
Cr			2	0.165	ug/l	6.05	1,859.02	4.630E-03	Pulse	0.30	3
Mn			2	5.171	ug/l	1.16	24,422.65	6.084E-02	Pulse	0.30	3
Fe			2	89.377	ug/l	1.24	621,359.89	1.548E+00	Pulse	0.30	3
Co			2	0.606	ug/l	0.50	8,747.40	2.179E-02	Pulse	0.30	3
Ni			2	2.287	ug/l	2.79	8,838.02	2.202E-02	Pulse	0.30	3
Cu			2	104.094	ug/l	0.76	1,113,385.62	2.774E+00	Pulse	0.30	3
Zn			2	20.069	ug/l	2.04	33,067.81	8.238E-02	Pulse	0.30	3
As			2	0.080	ug/l	19.59	96.67	2.410E-04	Pulse	1.00	3
Cd			2	0.075	ug/l	21.13	209.93	8.486E-05	Pulse	0.30	3
Sn			2	0.310	ug/l	2.10	1,058.94	4.275E-04	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	0.115	ug/l	14.66	50.87	7.954E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,107,205.02	0.54	97.0	Pulse	0.10	3
1	Sc		6,337,861.99	0.40	98.8	Analog	0.10	3
1	Ge		1,249,235.16	1.21	100.4	Pulse	0.10	3
1	Ge		1,740,218.10	0.57	100.1	Pulse	0.10	3
1	Rh		9,429,969.65	0.64	97.7	Analog	0.10	3
1	In		9,695,133.11	0.63	99.0	Analog	0.10	3
1	Tb		14,800,674.78	0.28	99.3	Analog	0.10	3
1	Ho		15,097,033.94	0.55	100.5	Analog	0.10	3
1	Bi		9,581,100.90	0.44	98.5	Analog	0.10	3
2	Sc		401,413.86	0.96	100.9	Pulse	0.30	3
2	Ge		250,224.75	1.18	104.2	Pulse	0.30	3
2	Ge		377,312.38	0.56	103.9	Pulse	0.30	3
2	Rh		6,757,012.65	0.40	100.2	Analog	0.30	3
2	In		2,476,943.26	0.97	102.1	Pulse	0.30	3
2	Tb		9,294,990.74	1.04	100.0	Analog	0.30	3
2	Ho		9,520,381.01	1.20	99.8	Analog	0.30	3
2	Bi		6,551,058.77	0.38	99.3	Analog	0.30	3
3	Sc		673,376.69	0.96	97.9	Pulse	0.30	3
3	Ge		423,197.83	0.69	99.8	Pulse	0.30	3
3	Ge		639,594.87	0.58	100.8	Pulse	0.30	3
3	Rh		6,412,812.80	0.72	100.8	Analog	0.30	3
3	Tb		11,046,797.34	0.51	102.5	Analog	0.30	3

Quantitation Report

File Name	046SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 13:54
Sample Name	JD1302-1
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	-0.002	ug/l	-88.96	18.67	5.972E-06	Pulse	0.25	3
B			1	82.397	ug/l	1.91	393,443.93	1.264E-01	Pulse	0.15	3
Ca			1	52197.959	ug/l	0.75	43,827,324.35	6.862E+00	Analog	0.10	3
Sr			1	154.830	ug/l	2.04	6,921,616.15	7.748E-01	Analog	0.10	3
Mo			1	0.449	ug/l	3.32	3,807.26	4.259E-04	Pulse	0.10	3
Ag			1	0.026	ug/l	21.81	590.03	6.229E-05	Pulse	0.10	3
Sn			1	0.085	ug/l	29.22	2,253.59	2.384E-04	Pulse	0.10	3
Sb			1	0.368	ug/l	3.37	2,476.96	1.690E-04	Pulse	0.10	3
Ba			1	28.010	ug/l	1.08	202,263.88	1.380E-02	Pulse	0.10	3
Tl			1	0.006	ug/l	14.04	300.01	3.365E-05	Pulse	0.10	3
Pb			1	1.691	ug/l	0.20	27,930.74	3.137E-03	Pulse	0.10	3
Pb			1	1.621	ug/l	3.56	23,626.18	2.652E-03	Pulse	0.10	3
Pb			1	1.628	ug/l	1.28	108,571.52	1.219E-02	Pulse	0.10	3
Na			2	42621.786	ug/l	0.54	63,127,995.27	1.528E+02	Analog	0.30	3
Mg			2	12151.448	ug/l	0.56	8,733,989.65	2.114E+01	Analog	0.30	3
Al			2	1.349	ug/l	11.09	385.56	9.330E-04	Pulse	0.30	3
K			2	2362.191	ug/l	0.66	1,225,015.12	2.965E+00	Pulse	0.30	3
Ca			2	52361.057	ug/l	0.73	1,448,135.98	3.505E+00	Pulse	0.30	3
Ti			2	0.059	ug/l	142.89	36.67	8.885E-05	Pulse	0.30	3
V			2	0.877	ug/l	3.54	6,384.64	1.545E-02	Pulse	0.30	3
Cr			2	0.366	ug/l	1.43	3,761.58	9.106E-03	Pulse	0.30	3
Mn			2	0.647	ug/l	0.74	2,699.14	6.533E-03	Pulse	0.30	3
Fe			2	5.324	ug/l	2.39	40,750.16	9.865E-02	Pulse	0.30	3
Co			2	0.143	ug/l	3.44	2,153.39	5.213E-03	Pulse	0.30	3
Ni			2	4.403	ug/l	2.27	17,478.29	4.230E-02	Pulse	0.30	3
Cu			2	144.843	ug/l	0.83	1,587,687.75	3.843E+00	Pulse	0.30	3
Zn			2	351.455	ug/l	0.59	588,773.50	1.425E+00	Pulse	0.30	3
As			2	0.646	ug/l	1.79	581.34	1.407E-03	Pulse	1.00	3
Cd			2	0.080	ug/l	5.94	221.86	9.008E-05	Pulse	0.30	3
Sn			2	0.242	ug/l	2.84	717.80	2.914E-04	Pulse	0.30	3
Se			3	0.081	ug/l	17.81	41.27	6.594E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,112,605.20	1.29	97.1	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		6,387,007.82	1.00	99.6	Analog	0.10	3
1	Ge		1,226,937.35	1.55	98.6	Pulse	0.10	3
1	Ge		1,721,722.32	0.88	99.1	Pulse	0.10	3
1	Rh		8,935,856.53	1.76	92.6	Analog	0.10	3
1	In		9,463,447.50	0.98	96.6	Analog	0.10	3
1	Tb		14,656,708.95	0.50	98.4	Analog	0.10	3
1	Ho		14,997,109.78	1.07	99.8	Analog	0.10	3
1	Bi		8,904,752.58	1.20	91.6	Analog	0.10	3
2	Sc		413,121.56	0.59	103.9	Pulse	0.30	3
2	Ge		248,265.49	0.72	103.4	Pulse	0.30	3
2	Ge		375,434.86	1.48	103.4	Pulse	0.30	3
2	Rh		6,396,840.58	0.97	94.8	Analog	0.30	3
2	In		2,463,760.92	0.79	101.5	Pulse	0.30	3
2	Tb		9,187,569.08	0.52	98.9	Analog	0.30	3
2	Ho		9,548,726.29	0.56	100.1	Analog	0.30	3
2	Bi		6,136,835.73	0.79	93.0	Analog	0.30	3
3	Sc		678,221.41	0.93	98.6	Pulse	0.30	3
3	Ge		416,720.34	0.51	98.3	Pulse	0.30	3
3	Ge		625,808.57	0.10	98.6	Pulse	0.30	3
3	Rh		6,069,988.51	0.62	95.4	Analog	0.30	3
3	Tb		10,970,183.73	0.50	101.8	Analog	0.30	3

Quantitation Report

File Name	047SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 13:59
Sample Name	JD1302-3
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.010	ug/l	68.93	100.00	3.162E-05	Pulse	0.25	3
B			1	3.694	ug/l	3.12	19,974.32	6.307E-03	Pulse	0.15	3
Ca			1	189.919	ug/l	1.04	165,980.46	2.616E-02	Pulse	0.10	3
Sr			1	2.652	ug/l	1.50	124,284.40	1.332E-02	Pulse	0.10	3
Mo			1	0.039	ug/l	10.00	390.02	4.180E-05	Pulse	0.10	3
Ag			1	0.014	ug/l	10.55	323.35	3.344E-05	Pulse	0.10	3
Sn			1	0.011	ug/l	69.35	1,236.76	1.281E-04	Pulse	0.10	3
Sb			1	0.271	ug/l	2.33	796.72	5.499E-05	Pulse	0.10	3
Ba			1	2.612	ug/l	5.14	18,641.79	1.288E-03	Pulse	0.10	3
Tl			1	0.015	ug/l	17.07	726.71	7.829E-05	Pulse	0.10	3
Pb			1	0.016	ug/l	13.11	493.36	5.307E-05	Pulse	0.10	3
Pb			1	0.008	ug/l	63.51	416.69	4.487E-05	Pulse	0.10	3
Pb			1	0.011	ug/l	8.24	1,946.81	2.095E-04	Pulse	0.10	3
Na			2	36.978	ug/l	0.41	63,967.64	1.610E-01	Pulse	0.30	3
Mg			2	6.640	ug/l	4.20	4,642.92	1.169E-02	Pulse	0.30	3
Al			2	2.908	ug/l	11.52	733.36	1.846E-03	Pulse	0.30	3
K			2	21.002	ug/l	2.41	22,428.45	5.646E-02	Pulse	0.30	3
Ca			2	193.911	ug/l	2.16	5,259.79	1.324E-02	Pulse	0.30	3
Ti			2	-0.011	ug/l	-687.86	21.11	5.305E-05	Pulse	0.30	3
V			2	-0.011	ug/l	-25.74	96.67	2.435E-04	Pulse	0.30	3
Cr			2	0.073	ug/l	9.04	1,027.82	2.587E-03	Pulse	0.30	3
Mn			2	0.388	ug/l	7.44	1,358.96	3.420E-03	Pulse	0.30	3
Fe			2	1.415	ug/l	3.97	12,409.22	3.124E-02	Pulse	0.30	3
Co			2	0.075	ug/l	6.08	1,115.58	2.808E-03	Pulse	0.30	3
Ni			2	1.051	ug/l	3.74	4,038.33	1.017E-02	Pulse	0.30	3
Cu			2	8.170	ug/l	0.95	101,779.69	2.562E-01	Pulse	0.30	3
Zn			2	2.256	ug/l	2.69	4,049.44	1.019E-02	Pulse	0.30	3
As			2	0.001	ug/l	148.40	31.33	7.888E-05	Pulse	1.00	3
Cd			2	-0.002	ug/l	-151.04	15.52	6.376E-06	Pulse	0.30	3
Sn			2	0.185	ug/l	0.95	431.12	1.772E-04	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	0.028	ug/l	29.29	27.47	4.438E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,167,480.27	1.01	98.8	Pulse	0.10	3
1	Sc		6,344,027.82	1.00	98.9	Analog	0.10	3
1	Ge		1,244,373.06	0.55	100.0	Pulse	0.10	3
1	Ge		1,733,669.87	0.65	99.7	Pulse	0.10	3
1	Rh		9,328,033.20	1.66	96.6	Analog	0.10	3
1	In		9,664,432.81	1.37	98.6	Analog	0.10	3
1	Tb		14,476,713.53	0.97	97.2	Analog	0.10	3
1	Ho		14,679,999.36	1.24	97.7	Analog	0.10	3
1	Bi		9,292,386.11	1.07	95.6	Analog	0.10	3
2	Sc		397,214.55	0.50	99.9	Pulse	0.30	3
2	Ge		245,129.22	1.01	102.1	Pulse	0.30	3
2	Ge		368,507.57	0.53	101.4	Pulse	0.30	3
2	Rh		6,632,268.62	0.75	98.3	Analog	0.30	3
2	In		2,433,463.96	0.79	100.3	Pulse	0.30	3
2	Tb		9,164,729.36	1.58	98.6	Analog	0.30	3
2	Ho		9,384,057.68	1.15	98.4	Analog	0.30	3
2	Bi		6,493,158.77	1.13	98.4	Analog	0.30	3
3	Sc		650,281.38	0.80	94.6	Pulse	0.30	3
3	Ge		409,378.77	1.12	96.6	Pulse	0.30	3
3	Ge		618,782.07	0.46	97.5	Pulse	0.30	3
3	Rh		6,314,636.69	1.50	99.2	Analog	0.30	3
3	Tb		10,890,752.35	0.69	101.1	Analog	0.30	3

Quantitation Report

File Name	048LCCV.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 14:04
Sample Name	CRI
Sample Type	LLCCV
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.432	ug/l	4.37	2,764.27	9.290E-04	Pulse	0.25	3
B			1	25.343	ug/l	0.91	117,119.32	3.935E-02	Pulse	0.15	3
Ca			1	249.037	ug/l	0.98	204,578.90	3.394E-02	Pulse	0.10	3
Sr			1	4.433	ug/l	0.96	200,726.96	2.223E-02	Pulse	0.10	3
Mo			1	0.911	ug/l	2.70	7,755.51	8.586E-04	Pulse	0.10	3
Ag			1	0.454	ug/l	7.76	10,080.23	1.072E-03	Pulse	0.10	3
Sn			1	4.557	ug/l	2.33	65,078.82	6.922E-03	Pulse	0.10	3
Sb			1	2.202	ug/l	1.23	32,881.94	2.323E-03	Pulse	0.10	3
Ba			1	0.946	ug/l	6.98	6,614.99	4.674E-04	Pulse	0.10	3
Tl			1	0.436	ug/l	3.03	21,299.38	2.350E-03	Pulse	0.10	3
Pb			1	0.460	ug/l	0.84	7,885.72	8.700E-04	Pulse	0.10	3
Pb			1	0.416	ug/l	2.79	6,384.95	7.043E-04	Pulse	0.10	3
Pb			1	0.438	ug/l	1.74	30,607.00	3.377E-03	Pulse	0.10	3
Na			2	244.800	ug/l	0.82	347,155.08	9.060E-01	Pulse	0.30	3
Mg			2	241.259	ug/l	0.06	160,894.34	4.199E-01	Pulse	0.30	3
Al			2	24.971	ug/l	4.12	5,658.80	1.477E-02	Pulse	0.30	3
K			2	241.591	ug/l	0.14	126,658.57	3.305E-01	Pulse	0.30	3
Ca			2	262.456	ug/l	1.93	6,832.60	1.783E-02	Pulse	0.30	3
Ti			2	1.037	ug/l	26.17	224.45	5.856E-04	Pulse	0.30	3
V			2	0.965	ug/l	5.03	6,503.58	1.698E-02	Pulse	0.30	3
Cr			2	0.892	ug/l	1.24	7,984.25	2.084E-02	Pulse	0.30	3
Mn			2	1.036	ug/l	0.78	4,292.82	1.120E-02	Pulse	0.30	3
Fe			2	24.551	ug/l	0.91	164,840.17	4.302E-01	Pulse	0.30	3
Co			2	0.454	ug/l	3.58	6,263.05	1.635E-02	Pulse	0.30	3
Ni			2	0.890	ug/l	2.31	3,304.82	8.624E-03	Pulse	0.30	3
Cu			2	0.749	ug/l	5.43	23,559.21	6.148E-02	Pulse	0.30	3
Zn			2	4.441	ug/l	2.43	7,298.38	1.905E-02	Pulse	0.30	3
As			2	0.423	ug/l	6.23	363.67	9.493E-04	Pulse	1.00	3
Cd			2	0.417	ug/l	6.05	1,019.31	4.351E-04	Pulse	0.30	3
Sn			2	4.856	ug/l	2.27	22,457.22	9.585E-03	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	0.509	ug/l	6.17	150.20	2.401E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,976,572.85	1.50	92.9	Pulse	0.10	3
1	Sc		6,028,565.53	0.41	94.0	Analog	0.10	3
1	Ge		1,182,345.40	0.96	95.0	Pulse	0.10	3
1	Ge		1,653,425.18	1.66	95.1	Pulse	0.10	3
1	Rh		9,030,337.99	1.23	93.6	Analog	0.10	3
1	In		9,401,621.69	0.33	96.0	Analog	0.10	3
1	Tb		14,153,904.79	0.38	95.0	Analog	0.10	3
1	Ho		14,528,638.53	1.23	96.7	Analog	0.10	3
1	Bi		9,063,555.28	1.40	93.2	Analog	0.10	3
2	Sc		383,192.63	0.63	96.3	Pulse	0.30	3
2	Ge		233,652.65	0.32	97.3	Pulse	0.30	3
2	Ge		353,585.66	0.40	97.3	Pulse	0.30	3
2	Rh		6,623,007.38	1.54	98.2	Analog	0.30	3
2	In		2,342,929.20	0.15	96.5	Pulse	0.30	3
2	Tb		9,080,004.36	0.65	97.7	Analog	0.30	3
2	Ho		9,311,003.24	1.01	97.7	Analog	0.30	3
2	Bi		6,382,784.05	0.30	96.7	Analog	0.30	3
3	Sc		664,556.66	0.38	96.6	Pulse	0.30	3
3	Ge		415,461.16	0.96	98.0	Pulse	0.30	3
3	Ge		625,663.24	0.92	98.6	Pulse	0.30	3
3	Rh		6,500,135.02	0.72	102.1	Analog	0.30	3
3	Tb		11,257,548.72	0.94	104.5	Analog	0.30	3

Quantitation Report

File Name	049_CCV.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 14:09
Sample Name	CCVA
Sample Type	CCV
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	50.319	ug/l	1.14	314,691.99	1.071E-01	Pulse	0.25	3
B			1	105.980	ug/l	0.28	477,420.54	1.624E-01	Pulse	0.15	3
Ca			1	4981.028	ug/l	0.73	4,017,850.67	6.559E-01	Pulse	0.10	3
Sr			1	50.704	ug/l	1.56	2,254,276.43	2.538E-01	Pulse	0.10	3
Mo			1	50.668	ug/l	2.50	421,654.24	4.746E-02	Pulse	0.10	3
Ag			1	49.972	ug/l	1.68	1,080,320.92	1.178E-01	Pulse	0.10	3
Sn			1	49.821	ug/l	1.56	684,172.73	7.458E-02	Pulse	0.10	3
Sb			1	50.298	ug/l	0.48	844,618.69	5.882E-02	Pulse	0.10	3
Ba			1	49.271	ug/l	1.73	348,579.23	2.427E-02	Pulse	0.10	3
Tl			1	49.323	ug/l	2.19	2,381,420.33	2.657E-01	Pulse	0.10	3
Pb			1	50.656	ug/l	1.83	836,177.15	9.329E-02	Pulse	0.10	3
Pb			1	50.018	ug/l	1.85	724,835.35	8.087E-02	Pulse	0.10	3
Pb			1	50.106	ug/l	1.85	3,329,145.81	3.714E-01	Pulse	0.10	3
Na			2	5104.512	ug/l	0.94	7,171,643.60	1.833E+01	Analog	0.30	3
Mg			2	4899.793	ug/l	0.39	3,336,059.52	8.525E+00	Pulse	0.30	3
Al			2	4908.513	ug/l	0.25	1,124,929.36	2.875E+00	Pulse	0.30	3
K			2	4927.366	ug/l	0.44	2,407,702.54	6.152E+00	Pulse	0.30	3
Ca			2	5150.119	ug/l	0.89	135,012.17	3.450E-01	Pulse	0.30	3
Ti			2	48.900	ug/l	2.57	9,748.51	2.491E-02	Pulse	0.30	3
V			2	49.142	ug/l	0.88	329,781.23	8.427E-01	Pulse	0.30	3
Cr			2	48.735	ug/l	0.43	425,163.01	1.086E+00	Pulse	0.30	3
Mn			2	48.647	ug/l	0.34	228,018.41	5.827E-01	Pulse	0.30	3
Fe			2	4889.500	ug/l	0.98	32,995,398.69	8.432E+01	Analog	0.30	3
Co			2	48.671	ug/l	0.24	681,138.07	1.741E+00	Pulse	0.30	3
Ni			2	48.410	ug/l	0.76	181,611.65	4.641E-01	Pulse	0.30	3
Cu			2	47.166	ug/l	0.73	500,757.86	1.280E+00	Pulse	0.30	3
Zn			2	47.612	ug/l	0.47	75,913.51	1.940E-01	Pulse	0.30	3
As			2	49.421	ug/l	0.76	39,861.34	1.019E-01	Pulse	1.00	3
Cd			2	49.267	ug/l	0.58	119,502.31	5.039E-02	Pulse	0.30	3
Sn			2	50.325	ug/l	0.65	239,940.03	1.012E-01	Pulse	0.30	3
Se			3	204.014	ug/l	0.56	52,496.71	8.313E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,939,467.93	0.57	91.7	Pulse	0.10	3
1	Sc		6,125,384.91	0.56	95.5	Analog	0.10	3
1	Ge		1,189,617.33	1.45	95.6	Pulse	0.10	3

Quantitation Report

1	Ge		1,661,913.57	1.31	95.6	Pulse	0.10	3
1	Rh		8,885,060.28	1.75	92.0	Analog	0.10	3
1	In		9,174,196.67	1.36	93.6	Analog	0.10	3
1	Tb		14,359,390.62	0.96	96.4	Analog	0.10	3
1	Ho		14,747,731.03	0.95	98.1	Analog	0.10	3
1	Bi		8,962,308.20	0.56	92.2	Analog	0.10	3
2	Sc		391,331.77	0.81	98.4	Pulse	0.30	3
2	Ge		238,764.21	1.23	99.4	Pulse	0.30	3
2	Ge		361,165.33	0.57	99.4	Pulse	0.30	3
2	Rh		6,408,131.27	0.94	95.0	Analog	0.30	3
2	In		2,371,735.61	0.50	97.7	Pulse	0.30	3
2	Tb		9,013,623.81	1.01	97.0	Analog	0.30	3
2	Ho		9,228,043.24	0.73	96.8	Analog	0.30	3
2	Bi		6,203,132.53	1.08	94.0	Analog	0.30	3
3	Sc		675,256.78	0.59	98.2	Pulse	0.30	3
3	Ge		417,613.39	0.24	98.5	Pulse	0.30	3
3	Ge		631,485.60	0.17	99.5	Pulse	0.30	3
3	Rh		6,331,473.77	0.26	99.5	Analog	0.30	3
3	Tb		11,130,332.89	1.37	103.3	Analog	0.30	3

Quantitation Report

File Name	050_CCB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Method File	
Method Path	
Acq Time	1/10/2020 14:13
Sample Name	CCB
Sample Type	CCB
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/10/2020 11:59
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.003	ug/l	104.95	53.33	1.769E-05	Pulse	0.25	3
B			1	3.802	ug/l	2.61	19,547.09	6.472E-03	Pulse	0.15	3
Ca			1	0.980	ug/l	28.85	8,155.67	1.330E-03	Pulse	0.10	3
Sr			1	0.007	ug/l	19.77	800.05	8.626E-05	Pulse	0.10	3
Mo			1	0.140	ug/l	9.22	1,266.77	1.366E-04	Pulse	0.10	3
Ag			1	0.012	ug/l	33.00	293.35	3.041E-05	Pulse	0.10	3
Sn			1	0.401	ug/l	64.59	6,861.45	7.104E-04	Pulse	0.10	3
Sb			1	0.645	ug/l	4.22	7,111.90	4.933E-04	Pulse	0.10	3
Ba			1	0.012	ug/l	18.39	103.34	7.165E-06	Pulse	0.10	3
Tl			1	0.012	ug/l	22.27	576.70	6.218E-05	Pulse	0.10	3
Pb			1	0.021	ug/l	29.00	570.04	6.132E-05	Pulse	0.10	3
Pb			1	0.013	ug/l	25.06	500.03	5.393E-05	Pulse	0.10	3
Pb			1	0.014	ug/l	13.95	2,156.82	2.323E-04	Pulse	0.10	3
Na			2	1.571	ug/l	11.87	13,445.45	3.412E-02	Pulse	0.30	3
Mg			2	0.409	ug/l	8.67	334.45	8.499E-04	Pulse	0.30	3
Al			2	0.366	ug/l	23.48	141.12	3.572E-04	Pulse	0.30	3
K			2	0.458	ug/l	234.15	12,184.55	3.094E-02	Pulse	0.30	3
Ca			2	-1.142	ug/l	-43.89	73.34	1.854E-04	Pulse	0.30	3
Ti			2	-0.010	ug/l	-55.79	21.11	5.348E-05	Pulse	0.30	3
V			2	0.015	ug/l	81.46	267.78	6.813E-04	Pulse	0.30	3
Cr			2	0.002	ug/l	531.94	392.23	9.974E-04	Pulse	0.30	3
Mn			2	0.125	ug/l	1.78	103.33	2.617E-04	Pulse	0.30	3
Fe			2	1.691	ug/l	14.25	14,177.76	3.601E-02	Pulse	0.30	3
Co			2	0.001	ug/l	69.77	62.18	1.585E-04	Pulse	0.30	3
Ni			2	0.006	ug/l	58.11	61.11	1.557E-04	Pulse	0.30	3
Cu			2	-1.014	ug/l	-1.55	5,985.60	1.519E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	-0.144	ug/l	-5.45	185.56	4.703E-04	Pulse	0.30	3
As			2	0.012	ug/l	96.17	40.33	1.022E-04	Pulse	1.00	3
Cd			2	-0.003	ug/l	-140.39	13.18	5.546E-06	Pulse	0.30	3
Sn			2	0.510	ug/l	2.03	2,015.71	8.315E-04	Pulse	0.30	3
Se			3	0.101	ug/l	11.93	46.13	7.408E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,020,374.10	0.68	94.2	Pulse	0.10	3
1	Sc		6,134,788.66	1.92	95.7	Analog	0.10	3
1	Ge		1,202,280.24	0.87	96.6	Pulse	0.10	3
1	Ge		1,676,443.98	0.72	96.4	Pulse	0.10	3
1	Rh		9,272,976.11	0.56	96.1	Analog	0.10	3
1	In		9,641,364.63	0.54	98.4	Analog	0.10	3
1	Tb		14,427,935.62	1.55	96.8	Analog	0.10	3
1	Ho		14,694,968.12	1.72	97.8	Analog	0.10	3
1	Bi		9,284,188.40	1.99	95.5	Analog	0.10	3
2	Sc		394,231.10	3.63	99.1	Pulse	0.30	3
2	Ge		240,587.92	2.10	100.2	Pulse	0.30	3
2	Ge		362,775.98	1.66	99.9	Pulse	0.30	3
2	Rh		6,829,009.31	3.00	101.2	Analog	0.30	3
2	In		2,423,163.32	4.17	99.9	Pulse	0.30	3
2	Tb		9,264,341.30	3.71	99.7	Analog	0.30	3
2	Ho		9,574,502.95	4.44	100.4	Analog	0.30	3
2	Bi		6,463,451.27	3.18	98.0	Analog	0.30	3
3	Sc		659,810.77	0.47	95.9	Pulse	0.30	3
3	Ge		413,894.02	0.81	97.6	Pulse	0.30	3
3	Ge		622,836.22	0.49	98.2	Pulse	0.30	3
3	Rh		6,421,242.66	1.36	100.9	Analog	0.30	3
3	Tb		11,092,450.95	0.68	103.0	Analog	0.30	3

Current Signal

[1]

Mass	Range	Count	Avg. Count	RSD [%]
7	5000	2305	2345.6	1.50
59	5000	2901	2958.4	2.72
89	10000	4905	5000.9	2.65
140	10000	5567	5390.5	2.52
205	5000	4417	4211.7	4.27
156/140	1	0.826 %	0.667 %	23.57
70/140	2	1.222 %	1.175 %	19.98
9	20	3	3.5	16.50
11	1000	509	548.1	9.82
88	100	37	47.0	24.99
95	20	6	5.5	23.47
107	20	3	3.5	71.90
121	20	18	15.3	22.32
137	50	14	17.0	22.53
208	50	26	28.5	7.30
Integration Time [sec]		0.10		

Plasma Parameters

RF Power	1500	W	Nebulizer Pump	0.10	rps
RF Matching	1.80	V	S/C Temp	2	℃
Smpl Depth	7.8	mm	Gas Switch	Dilution Gas	
Carrier Gas	0.55	L/min	Makeup/Dilution Gas	0.55	L/min
Option Gas	0.0	%			

Lenses Parameters

Extract 1	0.0	V	Cell Entrance	-40	V
Extract 2	-165.0	V	Cell Exit	-58	V
Omega Bias	-80	V	Deflect	15.2	V
Omega Lens	7.8	V	Plate Bias	-45	V

Cell Parameters

Use Gas	false		OctP Bias	-8.0	V
He Flow	0.0	mL/min	OctP RF	200	V
H2 Flow	0.0	mL/min	Energy Discrimination	5.0	V
3rd Gas Flow	0	%			

Meters

IF/BK Press	2.65E+2	Pa	TMP Revolution	100.0	%
Analyzer Press	1.29E-4	Pa	Water Temp	23.4	℃
Reflected Power	1	W			

US EPA Tune Check Sample Report

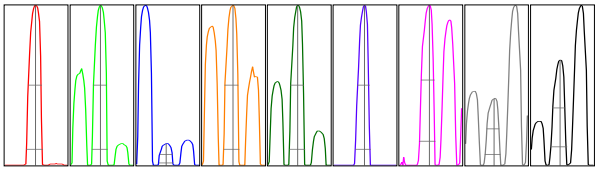
Batch Folder C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Report Comment
Instrument Name G3281A JP10340551

[1]

Mass	Count (Mean)	RSD% (Actual)	RSD% (Required)	RSD% (Flag)
9	80502	0.70	5.00	
24	328047	0.97	5.00	
25	43711	0.24	5.00	
26	51083	0.86	5.00	
59	402787	0.37	5.00	
115	628370	0.39	5.00	
206	192538	0.29	5.00	
207	178990	0.55	5.00	
208	420188	1.04	5.00	

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	79717	80782	81080	80128	80805
24	322570	329023	328501	329298	330844
25	43582	43801	43829	43645	43698
26	51821	50719	50990	50777	51106
59	402100	404649	400881	403862	402443
115	624044	629860	629570	629663	628711
206	191882	192252	193285	192362	192910
207	177833	180508	178671	179269	178670
208	415691	421629	425357	422667	415593

Integration Time [sec] = 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	Width-X% (Actual)	Width-X% (Required)	Width-X% (Flag)
9	13665	9.00	8.9 - 9.1		0.747	0.900	
24	56377	23.95	23.9 - 24.1		0.716	0.900	
25	7578	24.95	24.9 - 25.1		0.686	0.900	
26	8759	26.00	25.9 - 26.1		0.717	0.900	
59	70727	58.95	58.9 - 59.1		0.715	0.900	
115	120299	115.00	114.9 - 115.1		0.699	0.900	
206	33770	205.95	205.9 - 206.1		0.723	0.900	
207	30496	206.90	206.9 - 207.1		0.713	0.900	
208	73042	207.90	207.9 - 208.1		0.720	0.900	

X% = 10 **Integration Time [sec] =** 0.1 **Acquisition Time [sec] =** 235 **Y Axis =** Linear

Tune Parameters

Plasma Paramters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
RF Power	1500	W	Carrier Gas	0.55	L/min			
RF Matching	1.80	V	Option Gas	0.0	%			
Smpl Depth	7.8	mm	Nebulizer Pump	0.10	rps			
S/C Temp	2	℃						

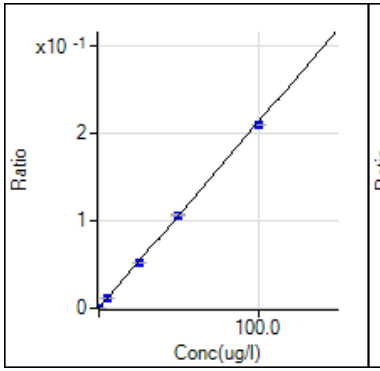
Lenses Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Extract 1	0.0	V	Omega Lens	7.8	V			
Extract 2	-165.0	V	Cell Entrance	-40	V			
Omega Bias	-80	V	Cell Exit	-58	V			
Deflect	15.2	V						

Cell Parameters

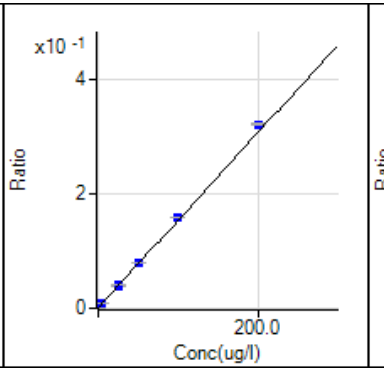
ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Use Gas	false		3rd Gas Flow	0	%			
He Flow	0.0	mL/min	OctP Bias	-8.0	V			
H2 Flow	0.0	mL/min	OctP RF	200	V			
Energy Discrimination	5.0	V						

Calibration for C:\Agilent\ICPMH\1\DATA\xa011020m1.b\001CALB.d



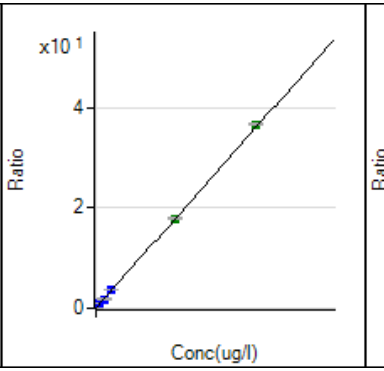
9 Be [1] / ISTD: 6 Li
y = 2.127E-3 x + 1.029E-5

R	1.0000
DL	0.002708
BEC	0.004836



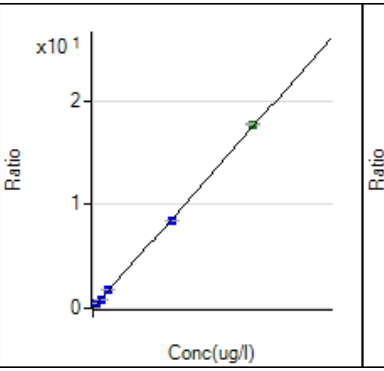
11 B [1] / ISTD: 6 Li
y = 1.526E-3 x + 6.696E-4

R	0.9999
DL	0.09271
BEC	0.4388



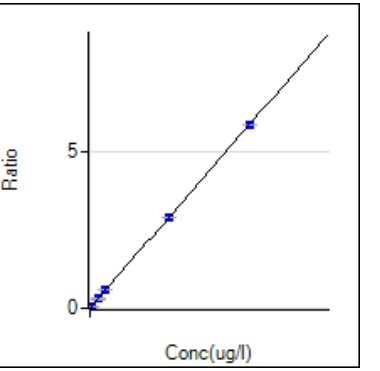
23 Na [2] / ISTD: 45 Sc
y = 3.585E-3 x + 2.849E-2

R	0.9999
DL	0.204
BEC	7.949



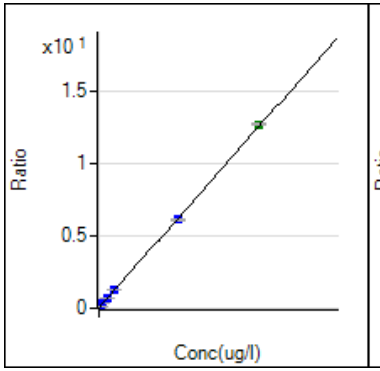
24 Mg [2] / ISTD: 45 Sc
y = 1.740E-3 x + 1.387E-4

R	0.9997
DL	0.08404
BEC	0.07973



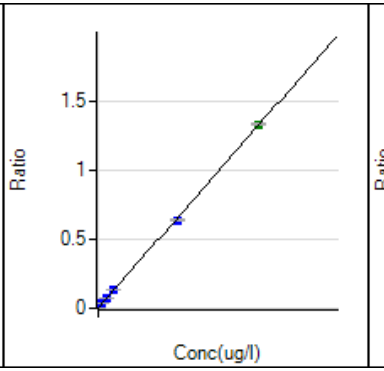
27 Al [2] / ISTD: 45 Sc
y = 5.856E-4 x + 1.431E-4

R	1.0000
DL	0.07537
BEC	0.2444



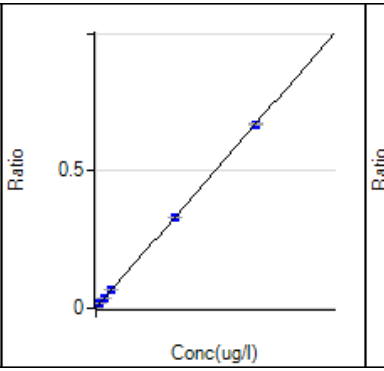
39 K [2] / ISTD: 45 Sc
y = 1.242E-3 x + 3.037E-2

R	0.9998
DL	2.315
BEC	24.44



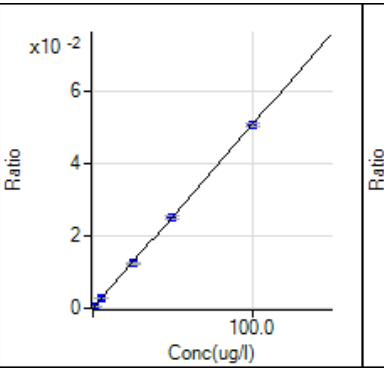
44 Ca [1] / ISTD: 45 Sc
y = 1.314E-4 x + 1.201E-3

R	0.9998
DL	1.294
BEC	9.137



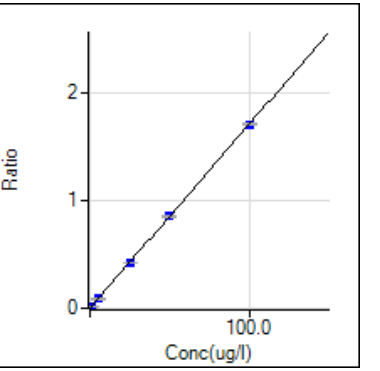
44 Ca [2] / ISTD: 45 Sc
y = 6.694E-5 x + 2.619E-4

R	1.0000
DL	3.474
BEC	3.912



47 Ti [2] / ISTD: 45 Sc
y = 5.082E-4 x + 5.867E-5

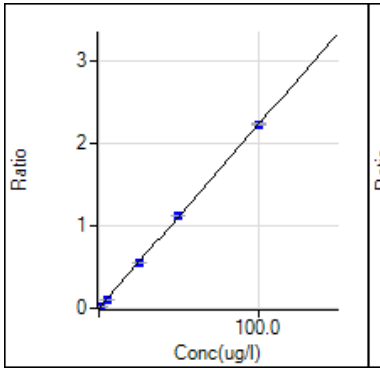
R	1.0000
DL	0.04945
BEC	0.1154



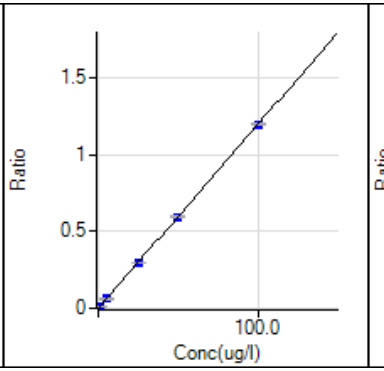
51 V [2] / ISTD: 45 Sc
y = 1.714E-2 x + 4.274E-4

R	1.0000
DL	0.008977
BEC	0.02493

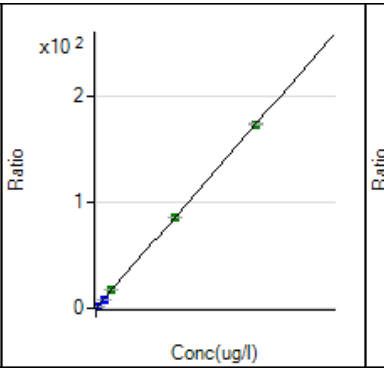
Calibration for C:\Agilent\ICPMH\1\DATA\xa011020m1.b\001CALB.d



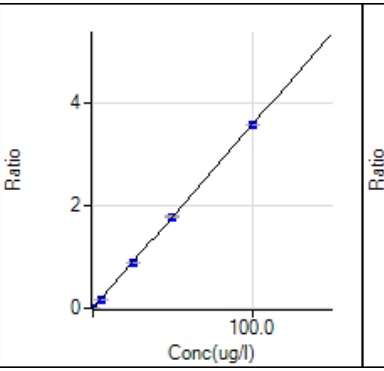
52 Cr [2] / ISTD: 45 Sc
y = 2.227E-2 x + 9.621E-4
R 1.0000
DL 0.01271
BEC 0.04319



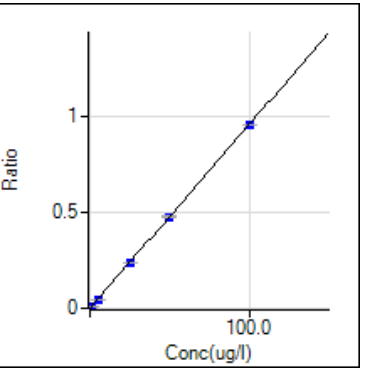
55 Mn [2] / ISTD: 45 Sc
y = 1.200E-2 x - 1.235E-3
R 1.0000
DL 0.01298
BEC -0.1029



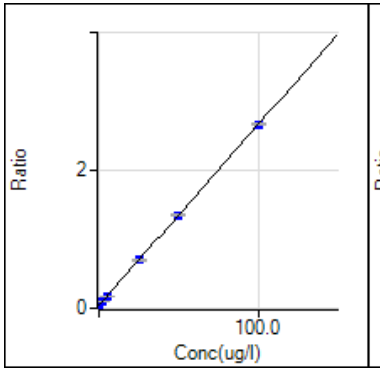
56 Fe [2] / ISTD: 45 Sc
y = 1.724E-2 x + 6.843E-3
R 1.0000
DL 0.05372
BEC 0.3969



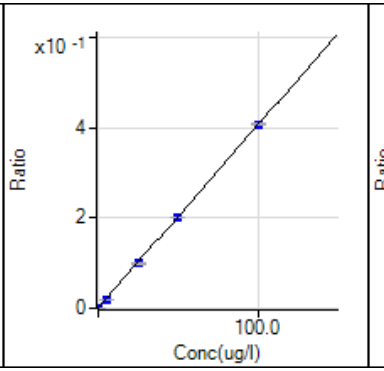
59 Co [2] / ISTD: 45 Sc
y = 3.576E-2 x + 1.122E-4
R 1.0000
DL 0.002104
BEC 0.003138



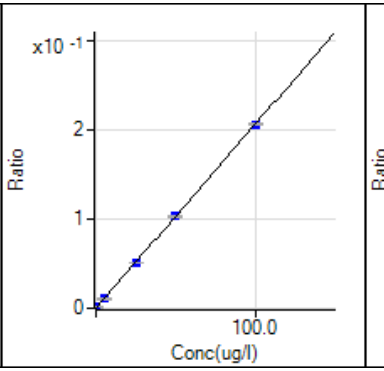
60 Ni [2] / ISTD: 45 Sc
y = 9.585E-3 x + 9.767E-5
R 1.0000
DL 0.01699
BEC 0.01019



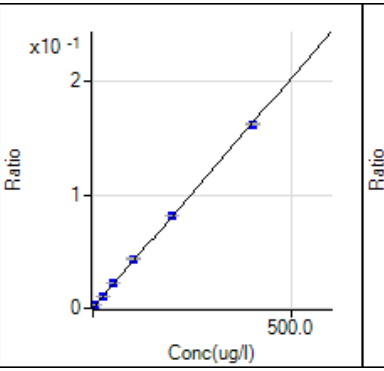
63 Cu [2] / ISTD: 45 Sc
y = 2.624E-2 x + 4.182E-2
R 1.0000
DL 0.07106
BEC 1.593



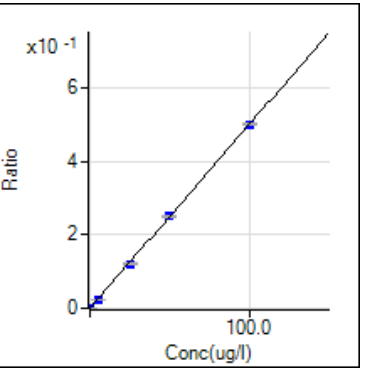
66 Zn [2] / ISTD: 45 Sc
y = 4.052E-3 x + 1.053E-3
R 1.0000
DL 0.08717
BEC 0.2599



75 As [2] / ISTD: 45 Sc
y = 2.060E-3 x + 7.710E-5
R 1.0000
DL 0.01039
BEC 0.03743

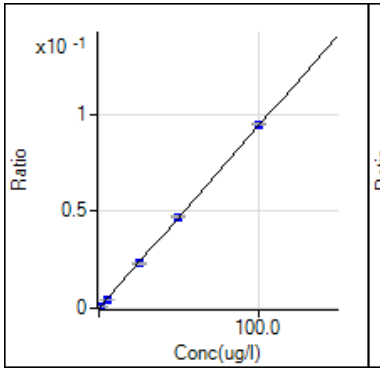


78 Se [3] / ISTD: 74 Ge
y = 4.073E-4 x + 3.279E-5
R 0.9998
DL 0.03265
BEC 0.08051



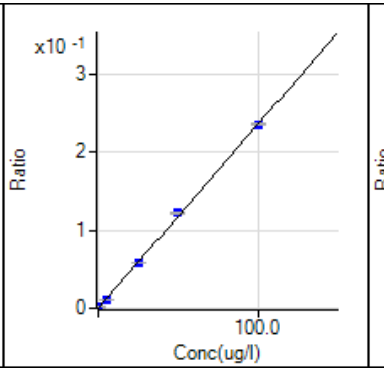
88 Sr [1] / ISTD: 103 Rh
y = 5.004E-3 x + 5.005E-5
R 1.0000
DL 0.003573
BEC 0.01

Calibration for C:\Agilent\ICPMH\1\DATA\xa011020m1.b\001CALB.d



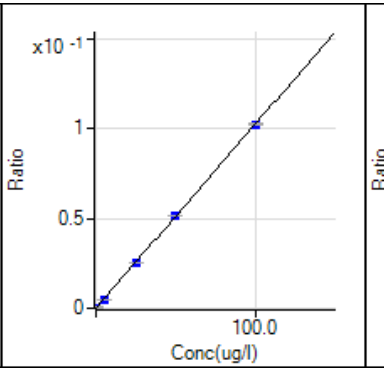
95 Mo [1] / ISTD: 103 Rh
y = 9.366E-4 x + 5.683E-6

R	1.0000
DL	0.00894
BEC	0.006068



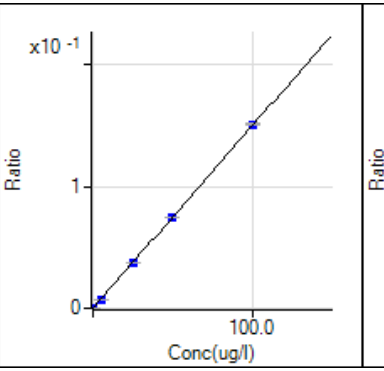
107 Ag [1] / ISTD: 115 In
y = 2.357E-3 x + 1.442E-6

R	0.9998
DL	0.002005
BEC	0.000612



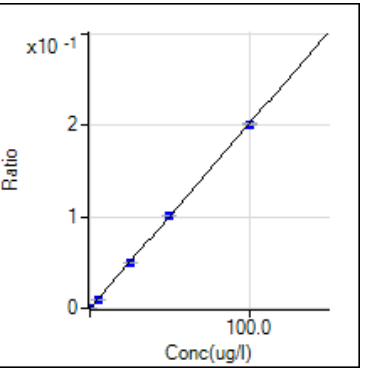
111 Cd [2] / ISTD: 115 In
y = 1.023E-3 x + 8.253E-6

R	1.0000
DL	0.01075
BEC	0.008071



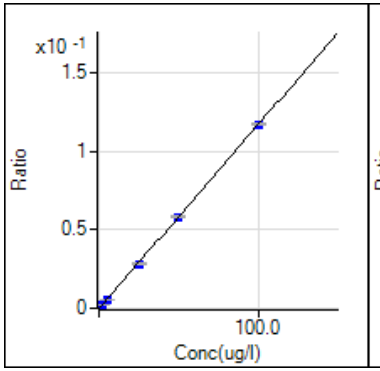
118 Sn [1] / ISTD: 115 In
y = 1.495E-3 x + 1.110E-4

R	1.0000
DL	0.04498
BEC	0.07426



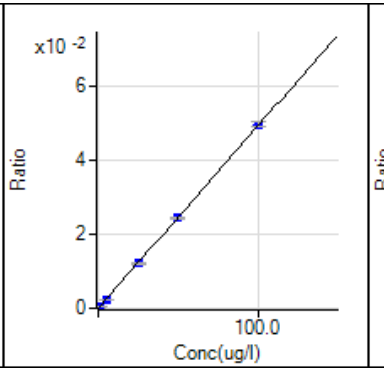
118 Sn [2] / ISTD: 115 In
y = 2.014E-3 x - 1.963E-4

R	1.0000
DL	0.03224
BEC	-0.09744



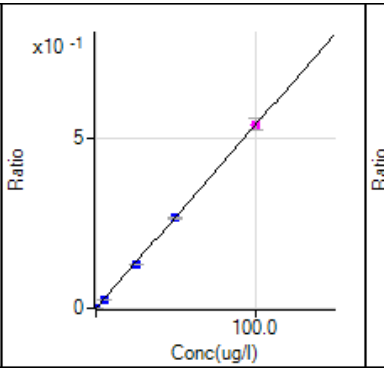
121 Sb [1] / ISTD: 159 Tb
y = 1.175E-3 x - 2.638E-4

R	1.0000
DL	0.02684
BEC	-0.2246



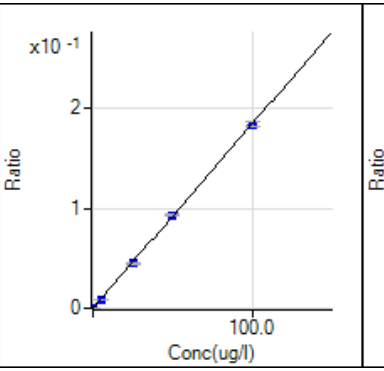
137 Ba [1] / ISTD: 159 Tb
y = 4.926E-4 x + 1.311E-6

R	1.0000
DL	0.002365
BEC	0.002661



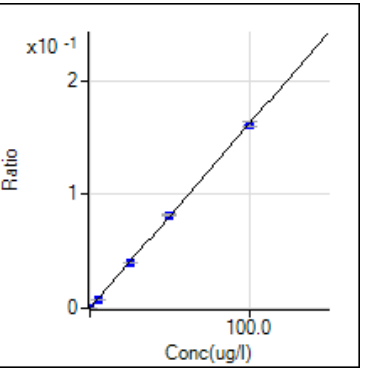
205 Tl [1] / ISTD: 209 Bi
y = 5.387E-3 x

R	0.9999
DL	0.00284
BEC	0



206 Pb [1] / ISTD: 209 Bi
y = 1.841E-3 x + 2.331E-5

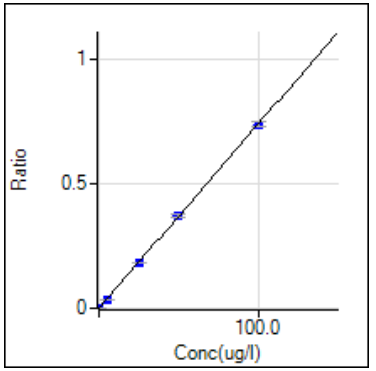
R	1.0000
DL	0.01085
BEC	0.01266



207 Pb [1] / ISTD: 209 Bi
y = 1.616E-3 x + 3.257E-5

R	1.0000
DL	0.004916
BEC	0.02015

Calibration for C:\Agilent\ICPMH\1\DATA\xa011020m1.b\001CALB.d



208 Pb [1] / ISTD: 209 Bi

y = 7.410E-3 x + 1.286E-4

R	1.0000
DL	0.0005179
BEC	0.01735

Quantitation Report

File Name	001CALB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 14:28
Sample Name	STDA 5
Sample Type	CalBlk
Comment	0
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	-0.001	ug/l	-229.17	29.33	9.794E-06	Pulse	0.25	3
B			1	0.365	ug/l	8.58	8,446.76	2.815E-03	Pulse	0.15	3
Ca			1	-0.635	ug/l	-75.75	8,239.00	1.309E-03	Pulse	0.10	3
Sr			1	-0.001	ug/l	-65.10	576.70	6.152E-05	Pulse	0.10	3
Mo			1	0.001	ug/l	554.49	96.67	1.035E-05	Pulse	0.10	3
Ag			1	0.004	ug/l	11.68	133.34	1.382E-05	Pulse	0.10	3
Sn			1	0.022	ug/l	3.71	1,413.45	1.466E-04	Pulse	0.10	3
Sb			1	0.288	ug/l	5.53	2,860.38	1.959E-04	Pulse	0.10	3
Ba			1	-0.003	ug/l	-54.21	40.00	2.748E-06	Pulse	0.10	3
Tl			1	0.003	ug/l	53.42	163.34	1.744E-05	Pulse	0.10	3
Pb			1	-0.003	ug/l	-98.24	260.01	2.769E-05	Pulse	0.10	3
Pb			1	0.000	ug/l	1222.31	256.68	2.733E-05	Pulse	0.10	3
Pb			1	0.000	ug/l	316.52	1,193.40	1.270E-04	Pulse	0.10	3
Na			2	-0.192	ug/l	-104.68	12,962.87	3.243E-02	Pulse	0.30	3
Mg			2	0.014	ug/l	425.68	221.12	5.532E-04	Pulse	0.30	3
Al			2	0.059	ug/l	82.55	60.00	1.502E-04	Pulse	0.30	3
K			2	0.682	ug/l	94.22	13,354.33	3.341E-02	Pulse	0.30	3
Ca			2	0.759	ug/l	55.72	122.22	3.059E-04	Pulse	0.30	3
Ti			2	0.020	ug/l	246.74	22.22	5.561E-05	Pulse	0.30	3
V			2	0.000	ug/l	2056.54	244.45	6.118E-04	Pulse	0.30	3
Cr			2	0.005	ug/l	60.58	414.45	1.037E-03	Pulse	0.30	3
Mn			2	-0.057	ug/l	-9.46	115.56	2.890E-04	Pulse	0.30	3
Fe			2	0.007	ug/l	411.26	4,472.88	1.119E-02	Pulse	0.30	3
Co			2	0.000	ug/l	-147.72	44.43	1.111E-04	Pulse	0.30	3
Ni			2	0.000	ug/l	-1010.42	41.11	1.028E-04	Pulse	0.30	3
Cu			2	-0.001	ug/l	-1170.54	5,910.03	1.479E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	-0.025	ug/l	-79.71	281.12	7.030E-04	Pulse	0.30	3
As			2	0.000	ug/l	22955.58	31.67	7.922E-05	Pulse	1.00	3
Cd			2	0.004	ug/l	123.61	26.65	1.098E-05	Pulse	0.30	3
Sn			2	0.169	ug/l	9.16	610.02	2.510E-04	Pulse	0.30	3
Se			3	0.000	ug/l	-3731.20	27.33	4.279E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,000,363.70	0.75	100.0	Pulse	0.10	3
1	Sc		6,295,093.24	0.45	100.0	Analog	0.10	3
1	Ge		1,203,171.57	0.21	100.0	Pulse	0.10	3
1	Ge		1,681,529.77	1.02	100.0	Pulse	0.10	3
1	Rh		9,372,950.90	1.20	100.0	Analog	0.10	3
1	In		9,644,326.96	0.66	100.0	Analog	0.10	3
1	Tb		14,591,459.37	1.38	100.0	Analog	0.10	3
1	Ho		14,818,757.28	0.49	100.0	Analog	0.10	3
1	Bi		9,400,966.11	1.11	100.0	Analog	0.10	3
2	Sc		399,720.69	0.49	100.0	Pulse	0.30	3
2	Ge		244,236.56	1.11	100.0	Pulse	0.30	3
2	Ge		368,417.48	0.14	100.0	Pulse	0.30	3
2	Rh		6,875,610.42	1.07	100.0	Analog	0.30	3
2	In		2,429,444.16	0.45	100.0	Pulse	0.30	3
2	Tb		9,359,055.74	0.96	100.0	Analog	0.30	3
2	Ho		9,660,064.06	1.55	100.0	Analog	0.30	3
2	Bi		6,560,423.49	0.89	100.0	Analog	0.30	3
3	Sc		684,760.95	0.27	100.0	Pulse	0.30	3
3	Ge		425,179.08	0.07	100.0	Pulse	0.30	3
3	Ge		638,624.25	0.56	100.0	Pulse	0.30	3
3	Rh		6,549,963.77	1.01	100.0	Analog	0.30	3
3	Tb		11,145,680.95	1.25	100.0	Analog	0.30	3

Quantitation Report

File Name	002CALB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 14:32
Sample Name	STDA
Sample Type	CalBlk
Comment	0
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.000	ug/l	-461.02	33.33	1.104E-05	Pulse	0.25	3
B			1	0.154	ug/l	32.40	7,508.50	2.489E-03	Pulse	0.15	3
Ca			1	-0.897	ug/l	-11.95	7,972.23	1.274E-03	Pulse	0.10	3
Sr			1	-0.003	ug/l	-29.52	483.36	5.180E-05	Pulse	0.10	3
Mo			1	0.000	ug/l	485.12	93.34	9.998E-06	Pulse	0.10	3
Ag			1	0.004	ug/l	72.79	126.67	1.310E-05	Pulse	0.10	3
Sn			1	0.014	ug/l	30.16	1,303.44	1.352E-04	Pulse	0.10	3
Sb			1	0.271	ug/l	6.56	2,550.30	1.748E-04	Pulse	0.10	3
Ba			1	0.005	ug/l	43.44	93.33	6.389E-06	Pulse	0.10	3
Tl			1	0.001	ug/l	37.53	66.67	7.154E-06	Pulse	0.10	3
Pb			1	-0.004	ug/l	-52.79	233.34	2.506E-05	Pulse	0.10	3
Pb			1	0.000	ug/l	948.39	256.68	2.754E-05	Pulse	0.10	3
Pb			1	0.000	ug/l	-257.55	1,133.40	1.217E-04	Pulse	0.10	3
Na			2	-0.553	ug/l	-53.19	12,533.66	3.111E-02	Pulse	0.30	3
Mg			2	-0.151	ug/l	-29.67	107.78	2.673E-04	Pulse	0.30	3
Al			2	-0.057	ug/l	-56.44	32.22	8.005E-05	Pulse	0.30	3
K			2	-1.093	ug/l	-25.12	12,569.27	3.120E-02	Pulse	0.30	3
Ca			2	-0.065	ug/l	-679.03	101.11	2.510E-04	Pulse	0.30	3
Ti			2	0.041	ug/l	1.56	26.67	6.621E-05	Pulse	0.30	3
V			2	0.002	ug/l	170.62	255.56	6.342E-04	Pulse	0.30	3
Cr			2	0.002	ug/l	279.54	386.68	9.600E-04	Pulse	0.30	3
Mn			2	-0.059	ug/l	-10.42	106.67	2.649E-04	Pulse	0.30	3
Fe			2	-0.103	ug/l	-13.42	3,742.70	9.291E-03	Pulse	0.30	3
Co			2	-0.001	ug/l	-107.90	43.32	1.076E-04	Pulse	0.30	3
Ni			2	-0.002	ug/l	-159.68	35.55	8.823E-05	Pulse	0.30	3
Cu			2	-0.002	ug/l	-208.03	5,946.69	1.476E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	-0.111	ug/l	-5.56	142.23	3.531E-04	Pulse	0.30	3
As			2	-0.006	ug/l	-120.14	27.00	6.698E-05	Pulse	1.00	3
Cd			2	-0.003	ug/l	-86.98	8.88	3.657E-06	Pulse	0.30	3
Sn			2	0.160	ug/l	6.68	564.46	2.323E-04	Pulse	0.30	3
Se			3	0.008	ug/l	65.23	29.33	4.594E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,016,569.00	0.33	100.0	Pulse	0.10	3
1	Sc		6,258,680.32	2.28	100.0	Analog	0.10	3
1	Ge		1,216,302.69	1.60	100.0	Pulse	0.10	3
1	Ge		1,685,260.29	1.11	100.0	Pulse	0.10	3
1	Rh		9,330,012.36	0.96	100.0	Analog	0.10	3
1	In		9,636,434.27	1.05	100.0	Analog	0.10	3
1	Tb		14,598,084.36	0.75	100.0	Analog	0.10	3
1	Ho		14,910,878.53	1.44	100.0	Analog	0.10	3
1	Bi		9,314,224.03	0.43	100.0	Analog	0.10	3
2	Sc		402,844.90	0.49	100.0	Pulse	0.30	3
2	Ge		244,898.64	0.59	100.0	Pulse	0.30	3
2	Ge		368,875.25	0.86	100.0	Pulse	0.30	3
2	Rh		6,848,718.20	0.78	100.0	Analog	0.30	3
2	In		2,429,706.96	0.20	100.0	Pulse	0.30	3
2	Tb		9,323,012.13	0.28	100.0	Analog	0.30	3
2	Ho		9,538,415.18	0.66	100.0	Analog	0.30	3
2	Bi		6,520,916.41	1.13	100.0	Analog	0.30	3
3	Sc		681,993.72	0.27	100.0	Pulse	0.30	3
3	Ge		422,882.92	0.36	100.0	Pulse	0.30	3
3	Ge		638,483.15	0.22	100.0	Pulse	0.30	3
3	Rh		6,674,171.12	0.47	100.0	Analog	0.30	3
3	Tb		11,313,313.16	1.56	100.0	Analog	0.30	3

Quantitation Report

File Name	003CALB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 14:37
Sample Name	STDA
Sample Type	CalBlk
Comment	0
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.000	ug/l	727.64	37.33	1.229E-05	Pulse	0.25	3
B			1	0.007	ug/l	301.01	6,874.87	2.260E-03	Pulse	0.15	3
Ca			1	0.182	ug/l	347.90	8,812.67	1.418E-03	Pulse	0.10	3
Sr			1	0.000	ug/l	---	613.38	6.591E-05	Pulse	0.10	3
Mo			1	0.000	ug/l	856.92	90.00	9.664E-06	Pulse	0.10	3
Ag			1	0.001	ug/l	124.46	53.33	5.564E-06	Pulse	0.10	3
Sn			1	0.009	ug/l	73.07	1,226.77	1.280E-04	Pulse	0.10	3
Sb			1	0.251	ug/l	1.54	2,210.24	1.523E-04	Pulse	0.10	3
Ba			1	0.002	ug/l	227.38	73.33	5.051E-06	Pulse	0.10	3
Tl			1	0.002	ug/l	36.02	110.00	1.179E-05	Pulse	0.10	3
Pb			1	0.000	ug/l	---	306.68	3.291E-05	Pulse	0.10	3
Pb			1	0.000	ug/l	---	250.01	2.683E-05	Pulse	0.10	3
Pb			1	0.000	ug/l	---	1,156.74	1.242E-04	Pulse	0.10	3
Na			2	0.109	ug/l	145.02	13,134.10	3.352E-02	Pulse	0.30	3
Mg			2	-0.002	ug/l	-1230.96	205.56	5.246E-04	Pulse	0.30	3
Al			2	0.022	ug/l	232.12	50.00	1.275E-04	Pulse	0.30	3
K			2	-0.057	ug/l	-845.96	12,729.41	3.249E-02	Pulse	0.30	3
Ca			2	-0.256	ug/l	-282.23	93.34	2.383E-04	Pulse	0.30	3
Ti			2	0.000	ug/l	---	17.78	4.527E-05	Pulse	0.30	3
V			2	0.000	ug/l	---	237.78	6.068E-04	Pulse	0.30	3
Cr			2	0.000	ug/l	670.99	364.45	9.302E-04	Pulse	0.30	3
Mn			2	-0.055	ug/l	-11.34	124.45	3.175E-04	Pulse	0.30	3
Fe			2	0.048	ug/l	62.91	4,658.60	1.189E-02	Pulse	0.30	3
Co			2	0.000	ug/l	219.39	55.55	1.417E-04	Pulse	0.30	3
Ni			2	0.000	ug/l	---	41.11	1.049E-04	Pulse	0.30	3
Cu			2	0.025	ug/l	75.45	6,063.42	1.548E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	0.000	ug/l	---	314.45	8.025E-04	Pulse	0.30	3
As			2	0.000	ug/l	---	31.00	7.914E-05	Pulse	1.00	3
Cd			2	0.000	ug/l	---	16.66	6.950E-06	Pulse	0.30	3
Sn			2	0.146	ug/l	8.72	488.90	2.041E-04	Pulse	0.30	3
Se			3	0.000	ug/l	---	27.00	4.286E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,041,583.67	0.62	100.0	Pulse	0.10	3
1	Sc		6,215,755.53	1.20	100.0	Analog	0.10	3
1	Ge		1,210,734.88	0.33	100.0	Pulse	0.10	3
1	Ge		1,689,137.79	1.17	100.0	Pulse	0.10	3
1	Rh		9,307,947.57	0.74	100.0	Analog	0.10	3
1	In		9,581,864.73	0.36	100.0	Analog	0.10	3
1	Tb		14,512,125.61	0.14	100.0	Analog	0.10	3
1	Ho		14,800,112.70	0.75	100.0	Analog	0.10	3
1	Bi		9,318,116.32	0.37	100.0	Analog	0.10	3
2	Sc		391,788.15	0.39	100.0	Pulse	0.30	3
2	Ge		240,940.03	0.34	100.0	Pulse	0.30	3
2	Ge		363,511.05	0.60	100.0	Pulse	0.30	3
2	Rh		6,722,992.79	1.61	100.0	Analog	0.30	3
2	In		2,395,526.90	0.27	100.0	Pulse	0.30	3
2	Tb		9,165,695.19	0.37	100.0	Analog	0.30	3
2	Ho		9,427,710.46	1.00	100.0	Analog	0.30	3
2	Bi		6,441,575.99	0.58	100.0	Analog	0.30	3
3	Sc		673,202.75	0.80	100.0	Pulse	0.30	3
3	Ge		415,612.66	0.48	100.0	Pulse	0.30	3
3	Ge		629,677.98	0.65	100.0	Pulse	0.30	3
3	Rh		6,614,255.01	1.23	100.0	Analog	0.30	3
3	Tb		11,355,545.38	0.83	100.0	Analog	0.30	3

Quantitation Report

File Name	004CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 14:43
Sample Name	STDB
Sample Type	CalStd
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.435	ug/l	6.72	2,820.27	9.338E-04	Pulse	0.25	3
B			1	23.196	ug/l	1.08	115,231.09	3.815E-02	Pulse	0.15	3
Ca			1	241.989	ug/l	1.64	211,247.99	3.381E-02	Pulse	0.10	3
Sr			1	4.453	ug/l	0.53	207,850.90	2.256E-02	Pulse	0.10	3
Mo			1	0.940	ug/l	2.47	8,082.36	8.774E-04	Pulse	0.10	3
Ag			1	0.468	ug/l	1.31	10,303.72	1.073E-03	Pulse	0.10	3
Sn			1	4.527	ug/l	2.88	66,373.91	6.912E-03	Pulse	0.10	3
Sb			1	2.056	ug/l	2.79	33,039.00	2.274E-03	Pulse	0.10	3
Ba			1	0.861	ug/l	1.49	6,251.48	4.302E-04	Pulse	0.10	3
Tl			1	0.433	ug/l	0.48	21,690.02	2.339E-03	Pulse	0.10	3
Pb			1	0.423	ug/l	6.81	7,712.33	8.313E-04	Pulse	0.10	3
Pb			1	0.436	ug/l	3.82	6,901.93	7.443E-04	Pulse	0.10	3
Pb			1	0.425	ug/l	1.99	30,870.38	3.328E-03	Pulse	0.10	3
Na			2	244.809	ug/l	0.31	363,159.35	9.241E-01	Pulse	0.30	3
Mg			2	248.430	ug/l	1.32	169,279.32	4.307E-01	Pulse	0.30	3
Al			2	24.242	ug/l	2.28	5,797.72	1.475E-02	Pulse	0.30	3
K			2	243.113	ug/l	0.61	131,744.32	3.352E-01	Pulse	0.30	3
Ca			2	271.232	ug/l	3.30	7,190.50	1.830E-02	Pulse	0.30	3
Ti			2	0.880	ug/l	23.33	192.23	4.893E-04	Pulse	0.30	3
V			2	0.904	ug/l	2.69	6,354.62	1.617E-02	Pulse	0.30	3
Cr			2	0.934	ug/l	2.73	8,508.94	2.165E-02	Pulse	0.30	3
Mn			2	0.855	ug/l	4.02	4,363.96	1.110E-02	Pulse	0.30	3
Fe			2	24.169	ug/l	0.36	168,631.49	4.291E-01	Pulse	0.30	3
Co			2	0.454	ug/l	2.99	6,424.21	1.635E-02	Pulse	0.30	3
Ni			2	0.902	ug/l	1.67	3,437.07	8.745E-03	Pulse	0.30	3
Cu			2	1.824	ug/l	1.91	24,650.79	6.272E-02	Pulse	0.30	3
Zn			2	4.647	ug/l	3.46	7,688.55	1.956E-02	Pulse	0.30	3
As			2	0.461	ug/l	7.91	405.34	1.031E-03	Pulse	1.00	3
Cd			2	0.459	ug/l	5.89	1,137.21	4.753E-04	Pulse	0.30	3
Sn			2	4.690	ug/l	2.40	22,650.84	9.467E-03	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	0.489	ug/l	5.24	152.67	2.415E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,020,382.08	0.34	99.3	Pulse	0.10	3
1	Sc		6,247,516.16	0.50	100.5	Analog	0.10	3
1	Ge		1,211,842.09	0.93	100.1	Pulse	0.10	3
1	Ge		1,694,126.74	1.37	100.3	Pulse	0.10	3
1	Rh		9,211,545.70	0.66	99.0	Analog	0.10	3
1	In		9,603,746.10	0.55	100.2	Analog	0.10	3
1	Tb		14,531,828.53	0.62	100.1	Analog	0.10	3
1	Ho		14,748,014.78	0.61	99.6	Analog	0.10	3
1	Bi		9,274,131.32	0.96	99.5	Analog	0.10	3
2	Sc		393,009.52	0.34	100.3	Pulse	0.30	3
2	Ge		240,503.88	0.59	99.8	Pulse	0.30	3
2	Ge		364,154.13	0.74	100.2	Pulse	0.30	3
2	Rh		6,804,208.06	0.72	101.2	Analog	0.30	3
2	In		2,392,739.23	0.16	99.9	Pulse	0.30	3
2	Tb		9,247,025.47	0.45	100.9	Analog	0.30	3
2	Ho		9,417,339.35	1.78	99.9	Analog	0.30	3
2	Bi		6,421,563.49	0.20	99.7	Analog	0.30	3
3	Sc		671,739.75	0.89	99.8	Pulse	0.30	3
3	Ge		419,831.41	0.37	101.0	Pulse	0.30	3
3	Ge		632,163.27	0.87	100.4	Pulse	0.30	3
3	Rh		6,623,365.15	0.23	100.1	Analog	0.30	3
3	Tb		11,222,164.28	0.84	98.8	Analog	0.30	3

Quantitation Report

File Name	005CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 14:47
Sample Name	STDC
Sample Type	CalStd
Comment	5
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	5.095	ug/l	1.61	32,751.45	1.081E-02	Pulse	0.25	3
B			1	5.302	ug/l	5.42	31,687.69	1.046E-02	Pulse	0.15	3
Ca			1	12.385	ug/l	3.03	19,054.94	3.053E-03	Pulse	0.10	3
Sr			1	4.898	ug/l	1.67	230,762.99	2.482E-02	Pulse	0.10	3
Mo			1	5.040	ug/l	2.35	43,359.47	4.663E-03	Pulse	0.10	3
Ag			1	5.004	ug/l	2.48	109,761.80	1.144E-02	Pulse	0.10	3
Sn			1	4.997	ug/l	1.16	73,056.68	7.617E-03	Pulse	0.10	3
Sb			1	5.104	ug/l	1.35	84,909.71	5.855E-03	Pulse	0.10	3
Ba			1	4.921	ug/l	0.93	35,377.88	2.440E-03	Pulse	0.10	3
Tl			1	4.802	ug/l	1.32	239,455.29	2.596E-02	Pulse	0.10	3
Pb			1	4.848	ug/l	2.35	84,756.04	9.187E-03	Pulse	0.10	3
Pb			1	4.831	ug/l	1.38	73,559.93	7.974E-03	Pulse	0.10	3
Pb			1	4.873	ug/l	0.81	339,885.25	3.684E-02	Pulse	0.10	3
Na			2	6.242	ug/l	4.42	21,764.09	5.584E-02	Pulse	0.30	3
Mg			2	5.686	ug/l	0.76	4,042.76	1.037E-02	Pulse	0.30	3
Al			2	5.750	ug/l	5.07	1,397.85	3.586E-03	Pulse	0.30	3
K			2	4.903	ug/l	2.26	15,069.17	3.867E-02	Pulse	0.30	3
Ca			2	33.248	ug/l	6.74	961.15	2.467E-03	Pulse	0.30	3
Ti			2	4.975	ug/l	3.68	995.60	2.555E-03	Pulse	0.30	3
V			2	5.052	ug/l	1.53	34,119.63	8.755E-02	Pulse	0.30	3
Cr			2	5.116	ug/l	1.36	44,616.58	1.145E-01	Pulse	0.30	3
Mn			2	5.008	ug/l	1.03	23,517.96	6.035E-02	Pulse	0.30	3
Fe			2	6.400	ug/l	12.29	47,453.55	1.218E-01	Pulse	0.30	3
Co			2	5.020	ug/l	0.96	70,001.92	1.796E-01	Pulse	0.30	3
Ni			2	5.026	ug/l	0.74	18,803.04	4.825E-02	Pulse	0.30	3
Cu			2	5.177	ug/l	1.39	58,774.58	1.508E-01	Pulse	0.30	3
Zn			2	5.334	ug/l	2.94	8,704.64	2.234E-02	Pulse	0.30	3
As			2	5.105	ug/l	1.12	4,141.21	1.063E-02	Pulse	1.00	3
Cd			2	4.940	ug/l	1.24	12,025.88	5.043E-03	Pulse	0.30	3
Sn			2	5.116	ug/l	0.80	24,643.81	1.033E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	5.467	ug/l	1.65	1,426.19	2.263E-03	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,031,354.40	0.78	99.7	Pulse	0.10	3
1	Sc		6,240,533.45	1.00	100.4	Analog	0.10	3
1	Ge		1,216,297.12	0.93	100.5	Pulse	0.10	3
1	Ge		1,694,356.22	1.50	100.3	Pulse	0.10	3
1	Rh		9,298,944.45	0.29	99.9	Analog	0.10	3
1	In		9,592,060.75	1.06	100.1	Analog	0.10	3
1	Tb		14,500,380.20	0.38	99.9	Analog	0.10	3
1	Ho		14,627,260.20	0.67	98.8	Analog	0.10	3
1	Bi		9,225,811.32	0.33	99.0	Analog	0.10	3
2	Sc		389,712.22	0.58	99.5	Pulse	0.30	3
2	Ge		240,304.04	0.27	99.7	Pulse	0.30	3
2	Ge		364,451.87	0.66	100.3	Pulse	0.30	3
2	Rh		6,739,534.87	0.60	100.2	Analog	0.30	3
2	In		2,384,610.72	0.35	99.5	Pulse	0.30	3
2	Tb		9,152,556.86	0.29	99.9	Analog	0.30	3
2	Ho		9,431,395.74	0.25	100.0	Analog	0.30	3
2	Bi		6,381,466.13	0.11	99.1	Analog	0.30	3
3	Sc		669,311.08	0.24	99.4	Pulse	0.30	3
3	Ge		420,131.97	0.29	101.1	Pulse	0.30	3
3	Ge		630,369.33	0.40	100.1	Pulse	0.30	3
3	Rh		6,540,322.24	0.58	98.9	Analog	0.30	3
3	Tb		11,211,078.45	0.50	98.7	Analog	0.30	3

Quantitation Report

File Name	006CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 14:52
Sample Name	STDD
Sample Type	CalStd
Comment	25
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	24.882	ug/l	0.45	158,849.82	5.272E-02	Pulse	0.25	3
B			1	25.176	ug/l	2.03	124,191.13	4.122E-02	Pulse	0.15	3
Ca			1	34.734	ug/l	1.34	36,868.39	6.047E-03	Pulse	0.10	3
Sr			1	24.569	ug/l	0.77	1,129,400.30	1.242E-01	Pulse	0.10	3
Mo			1	24.964	ug/l	0.84	209,666.98	2.306E-02	Pulse	0.10	3
Ag			1	24.996	ug/l	1.78	536,625.87	5.714E-02	Pulse	0.10	3
Sn			1	24.500	ug/l	1.60	346,540.52	3.690E-02	Pulse	0.10	3
Sb			1	24.332	ug/l	0.65	406,042.64	2.845E-02	Pulse	0.10	3
Ba			1	24.355	ug/l	1.52	172,115.47	1.206E-02	Pulse	0.10	3
Tl			1	24.033	ug/l	2.25	1,185,691.91	1.299E-01	Pulse	0.10	3
Pb			1	24.385	ug/l	1.63	420,598.97	4.608E-02	Pulse	0.10	3
Pb			1	24.472	ug/l	2.24	367,699.16	4.028E-02	Pulse	0.10	3
Pb			1	24.431	ug/l	1.41	1,681,276.42	1.842E-01	Pulse	0.10	3
Na			2	26.304	ug/l	2.02	50,385.59	1.289E-01	Pulse	0.30	3
Mg			2	25.741	ug/l	1.41	17,637.07	4.510E-02	Pulse	0.30	3
Al			2	24.946	ug/l	0.69	5,935.54	1.518E-02	Pulse	0.30	3
K			2	24.248	ug/l	1.37	24,536.98	6.275E-02	Pulse	0.30	3
Ca			2	139.937	ug/l	4.30	3,739.36	9.563E-03	Pulse	0.30	3
Ti			2	24.399	ug/l	1.56	4,830.77	1.235E-02	Pulse	0.30	3
V			2	25.144	ug/l	0.81	169,456.89	4.334E-01	Pulse	0.30	3
Cr			2	25.231	ug/l	0.57	219,384.85	5.610E-01	Pulse	0.30	3
Mn			2	24.906	ug/l	0.99	115,864.20	2.963E-01	Pulse	0.30	3
Fe			2	25.534	ug/l	1.65	177,001.48	4.527E-01	Pulse	0.30	3
Co			2	24.948	ug/l	0.80	348,858.63	8.921E-01	Pulse	0.30	3
Ni			2	24.641	ug/l	1.00	92,337.81	2.361E-01	Pulse	0.30	3
Cu			2	24.851	ug/l	0.95	261,106.17	6.677E-01	Pulse	0.30	3
Zn			2	24.612	ug/l	1.86	39,168.95	1.002E-01	Pulse	0.30	3
As			2	24.461	ug/l	1.16	19,794.64	5.062E-02	Pulse	1.00	3
Cd			2	24.688	ug/l	0.04	59,933.28	2.518E-02	Pulse	0.30	3
Sn			2	24.953	ug/l	0.76	120,866.02	5.077E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	26.770	ug/l	0.52	6,902.78	1.091E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,013,168.94	0.77	99.1	Pulse	0.10	3
1	Sc		6,097,149.28	0.83	98.1	Analog	0.10	3
1	Ge		1,197,616.02	1.11	98.9	Pulse	0.10	3
1	Ge		1,669,996.90	1.66	98.9	Pulse	0.10	3
1	Rh		9,092,474.45	0.94	97.7	Analog	0.10	3
1	In		9,390,718.50	0.67	98.0	Analog	0.10	3
1	Tb		14,271,723.96	1.01	98.3	Analog	0.10	3
1	Ho		14,543,015.20	0.39	98.3	Analog	0.10	3
1	Bi		9,128,036.32	0.34	98.0	Analog	0.10	3
2	Sc		391,045.56	0.92	99.8	Pulse	0.30	3
2	Ge		241,629.24	1.08	100.3	Pulse	0.30	3
2	Ge		365,324.49	0.69	100.5	Pulse	0.30	3
2	Rh		6,746,104.04	0.90	100.3	Analog	0.30	3
2	In		2,380,585.76	0.47	99.4	Pulse	0.30	3
2	Tb		9,122,000.75	0.55	99.5	Analog	0.30	3
2	Ho		9,321,969.91	0.72	98.9	Analog	0.30	3
2	Bi		6,316,222.67	0.32	98.1	Analog	0.30	3
3	Sc		674,010.53	0.53	100.1	Pulse	0.30	3
3	Ge		419,838.69	0.45	101.0	Pulse	0.30	3
3	Ge		632,560.58	0.53	100.5	Pulse	0.30	3
3	Rh		6,512,323.35	1.28	98.5	Analog	0.30	3
3	Tb		11,230,692.05	0.86	98.9	Analog	0.30	3

Quantitation Report

File Name	007CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 14:57
Sample Name	STDE
Sample Type	CalStd
Comment	50
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	50.388	ug/l	0.79	322,572.21	1.067E-01	Pulse	0.25	3
B			1	51.816	ug/l	1.22	249,145.01	8.245E-02	Pulse	0.15	3
Ca			1	73.330	ug/l	2.25	68,551.85	1.122E-02	Pulse	0.10	3
Sr			1	50.517	ug/l	2.22	2,319,027.26	2.553E-01	Pulse	0.10	3
Mo			1	51.126	ug/l	1.76	428,857.72	4.722E-02	Pulse	0.10	3
Ag			1	53.089	ug/l	1.23	1,136,926.81	1.214E-01	Pulse	0.10	3
Sn			1	50.261	ug/l	1.33	708,074.21	7.558E-02	Pulse	0.10	3
Sb			1	50.191	ug/l	0.86	837,485.69	5.884E-02	Pulse	0.10	3
Ba			1	50.144	ug/l	2.07	353,318.02	2.482E-02	Pulse	0.10	3
Tl			1	49.734	ug/l	2.12	2,431,991.99	2.688E-01	Pulse	0.10	3
Pb			1	50.550	ug/l	2.09	863,874.78	9.549E-02	Pulse	0.10	3
Pb			1	49.865	ug/l	1.76	742,370.04	8.206E-02	Pulse	0.10	3
Pb			1	50.039	ug/l	1.84	3,411,982.61	3.771E-01	Pulse	0.10	3
Na			2	52.998	ug/l	0.71	88,114.90	2.260E-01	Pulse	0.30	3
Mg			2	52.280	ug/l	0.76	35,503.97	9.106E-02	Pulse	0.30	3
Al			2	51.901	ug/l	1.84	12,263.46	3.145E-02	Pulse	0.30	3
K			2	51.942	ug/l	1.80	37,907.43	9.723E-02	Pulse	0.30	3
Ca			2	278.401	ug/l	4.34	7,319.46	1.877E-02	Pulse	0.30	3
Ti			2	50.024	ug/l	2.65	9,855.26	2.528E-02	Pulse	0.30	3
V			2	50.379	ug/l	0.71	338,293.76	8.677E-01	Pulse	0.30	3
Cr			2	50.402	ug/l	0.51	436,604.64	1.120E+00	Pulse	0.30	3
Mn			2	50.523	ug/l	0.08	233,975.17	6.001E-01	Pulse	0.30	3
Fe			2	52.554	ug/l	0.41	358,694.77	9.200E-01	Pulse	0.30	3
Co			2	50.357	ug/l	0.78	702,054.57	1.801E+00	Pulse	0.30	3
Ni			2	50.495	ug/l	0.71	188,614.21	4.838E-01	Pulse	0.30	3
Cu			2	50.426	ug/l	0.38	522,333.22	1.340E+00	Pulse	0.30	3
Zn			2	50.123	ug/l	0.86	79,215.44	2.032E-01	Pulse	0.30	3
As			2	50.140	ug/l	0.74	40,422.75	1.037E-01	Pulse	1.00	3
Cd			2	50.358	ug/l	0.84	122,183.00	5.135E-02	Pulse	0.30	3
Sn			2	50.365	ug/l	1.26	244,073.27	1.026E-01	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	54.441	ug/l	0.60	13,932.31	2.215E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,021,779.69	0.76	99.3	Pulse	0.10	3
1	Sc		6,111,640.74	0.66	98.3	Analog	0.10	3
1	Ge		1,215,107.25	1.31	100.4	Pulse	0.10	3
1	Ge		1,689,559.71	1.88	100.0	Pulse	0.10	3
1	Rh		9,082,999.45	0.25	97.6	Analog	0.10	3
1	In		9,367,664.64	0.50	97.8	Analog	0.10	3
1	Tb		14,231,988.96	0.71	98.1	Analog	0.10	3
1	Ho		14,518,826.45	0.33	98.1	Analog	0.10	3
1	Bi		9,046,782.78	0.22	97.1	Analog	0.10	3
2	Sc		389,891.64	0.27	99.5	Pulse	0.30	3
2	Ge		239,562.17	0.84	99.4	Pulse	0.30	3
2	Ge		362,321.30	0.59	99.7	Pulse	0.30	3
2	Rh		6,634,275.15	0.42	98.7	Analog	0.30	3
2	In		2,379,663.87	0.82	99.3	Pulse	0.30	3
2	Tb		9,026,458.81	0.42	98.5	Analog	0.30	3
2	Ho		9,227,847.69	0.93	97.9	Analog	0.30	3
2	Bi		6,269,376.56	0.83	97.3	Analog	0.30	3
3	Sc		669,349.92	0.46	99.4	Pulse	0.30	3
3	Ge		416,629.23	0.41	100.2	Pulse	0.30	3
3	Ge		629,052.34	0.03	99.9	Pulse	0.30	3
3	Rh		6,412,622.94	1.42	97.0	Analog	0.30	3
3	Tb		11,109,377.34	1.32	97.8	Analog	0.30	3

Quantitation Report

File Name	008CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 15:02
Sample Name	STDF
Sample Type	CalStd
Comment	100
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	100.522	ug/l	0.78	645,708.00	2.129E-01	Pulse	0.25	3
B			1	101.606	ug/l	1.06	483,689.34	1.595E-01	Pulse	0.15	3
Ca			1	134.124	ug/l	0.57	119,386.64	1.936E-02	Pulse	0.10	3
Sr			1	99.877	ug/l	2.52	4,615,181.60	5.047E-01	Pulse	0.10	3
Mo			1	102.562	ug/l	2.26	866,008.89	9.471E-02	Pulse	0.10	3
Ag			1	103.215	ug/l	2.15	2,211,271.84	2.359E-01	Pulse	0.10	3
Sn			1	100.770	ug/l	1.17	1,419,120.45	1.514E-01	Pulse	0.10	3
Sb			1	100.065	ug/l	0.77	1,669,826.95	1.175E-01	Pulse	0.10	3
Ba			1	100.764	ug/l	1.22	709,135.72	4.988E-02	Pulse	0.10	3
Tl			1	100.385	ug/l	4.72	4,983,910.65	5.426E-01	Mix	0.10	3
Pb			1	99.887	ug/l	3.41	1,732,860.29	1.887E-01	Pulse	0.10	3
Pb			1	100.208	ug/l	3.70	1,514,424.56	1.649E-01	Pulse	0.10	3
Pb			1	100.129	ug/l	3.26	6,930,910.94	7.545E-01	Pulse	0.10	3
Na			2	103.616	ug/l	0.76	161,909.92	4.102E-01	Pulse	0.30	3
Mg			2	103.236	ug/l	0.79	70,768.07	1.793E-01	Pulse	0.30	3
Al			2	97.754	ug/l	1.74	23,342.93	5.914E-02	Pulse	0.30	3
K			2	101.130	ug/l	0.80	62,545.03	1.585E-01	Pulse	0.30	3
Ca			2	524.445	ug/l	2.77	13,869.25	3.514E-02	Pulse	0.30	3
Ti			2	100.141	ug/l	1.20	19,954.34	5.056E-02	Pulse	0.30	3
V			2	99.773	ug/l	0.29	677,999.09	1.718E+00	Pulse	0.30	3
Cr			2	99.893	ug/l	0.13	875,617.95	2.218E+00	Pulse	0.30	3
Mn			2	99.763	ug/l	0.91	467,314.06	1.184E+00	Pulse	0.30	3
Fe			2	99.773	ug/l	0.91	685,433.38	1.737E+00	Pulse	0.30	3
Co			2	99.729	ug/l	0.28	1,407,457.96	3.566E+00	Pulse	0.30	3
Ni			2	99.842	ug/l	0.36	377,500.22	9.564E-01	Pulse	0.30	3
Cu			2	99.721	ug/l	0.62	1,039,948.57	2.635E+00	Pulse	0.30	3
Zn			2	100.053	ug/l	1.29	159,753.58	4.048E-01	Pulse	0.30	3
As			2	100.060	ug/l	0.38	81,630.54	2.068E-01	Pulse	1.00	3
Cd			2	99.902	ug/l	0.61	247,189.22	1.019E-01	Pulse	0.30	3
Sn			2	99.844	ug/l	0.86	493,685.52	2.034E-01	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	107.010	ug/l	0.51	27,618.27	4.349E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,032,220.16	0.97	99.7	Pulse	0.10	3
1	Sc		6,166,244.91	1.30	99.2	Analog	0.10	3
1	Ge		1,223,159.80	2.44	101.0	Pulse	0.10	3
1	Ge		1,706,170.39	2.69	101.0	Pulse	0.10	3
1	Rh		9,143,925.70	0.50	98.2	Analog	0.10	3
1	In		9,371,441.89	0.65	97.8	Analog	0.10	3
1	Tb		14,216,134.79	0.67	98.0	Analog	0.10	3
1	Ho		14,381,380.62	0.79	97.2	Analog	0.10	3
1	Bi		9,186,885.07	0.64	98.6	Analog	0.10	3
2	Sc		394,693.12	0.39	100.7	Pulse	0.30	3
2	Ge		244,654.10	0.52	101.5	Pulse	0.30	3
2	Ge		369,085.74	0.96	101.5	Pulse	0.30	3
2	Rh		6,713,086.40	0.21	99.9	Analog	0.30	3
2	In		2,426,933.24	1.36	101.3	Pulse	0.30	3
2	Tb		9,132,730.75	0.90	99.6	Analog	0.30	3
2	Ho		9,357,001.30	0.98	99.2	Analog	0.30	3
2	Bi		6,355,027.25	0.71	98.7	Analog	0.30	3
3	Sc		673,511.50	0.97	100.0	Pulse	0.30	3
3	Ge		420,276.54	0.74	101.1	Pulse	0.30	3
3	Ge		635,003.57	0.44	100.8	Pulse	0.30	3
3	Rh		6,423,347.52	0.65	97.1	Analog	0.30	3
3	Tb		11,161,710.95	1.64	98.3	Analog	0.30	3

Quantitation Report

File Name	009CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 15:07
Sample Name	STDG
Sample Type	CalStd
Comment	500MIN
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.010	ug/l	60.68	101.33	3.377E-05	Pulse	0.25	3
B			1	207.905	ug/l	1.07	972,538.15	3.240E-01	Pulse	0.15	3
Ca			1	503.843	ug/l	0.64	423,510.53	6.889E-02	Pulse	0.10	3
Sr			1	0.028	ug/l	5.08	1,890.19	2.097E-04	Pulse	0.10	3
Mo			1	0.265	ug/l	3.47	2,290.27	2.540E-04	Pulse	0.10	3
Ag			1	0.157	ug/l	7.18	3,407.16	3.631E-04	Pulse	0.10	3
Sn			1	0.640	ug/l	10.63	10,100.35	1.074E-03	Pulse	0.10	3
Sb			1	1.512	ug/l	1.96	23,251.36	1.634E-03	Pulse	0.10	3
Ba			1	0.044	ug/l	10.94	366.69	2.578E-05	Pulse	0.10	3
Tl			1	0.030	ug/l	13.04	1,473.47	1.613E-04	Pulse	0.10	3
Pb			1	0.029	ug/l	4.25	793.38	8.687E-05	Pulse	0.10	3
Pb			1	0.029	ug/l	4.72	686.71	7.522E-05	Pulse	0.10	3
Pb			1	0.030	ug/l	11.41	3,210.27	3.519E-04	Pulse	0.10	3
Na			2	501.863	ug/l	0.12	729,012.11	1.860E+00	Pulse	0.30	3
Mg			2	501.817	ug/l	0.14	340,889.41	8.695E-01	Pulse	0.30	3
Al			2	485.502	ug/l	0.74	114,978.43	2.933E-01	Pulse	0.30	3
K			2	506.778	ug/l	0.40	260,102.33	6.635E-01	Pulse	0.30	3
Ca			2	514.895	ug/l	1.83	13,527.85	3.450E-02	Pulse	0.30	3
Ti			2	0.056	ug/l	63.45	28.89	7.375E-05	Pulse	0.30	3
V			2	0.012	ug/l	62.56	320.01	8.166E-04	Pulse	0.30	3
Cr			2	0.055	ug/l	7.30	838.92	2.140E-03	Pulse	0.30	3
Mn			2	-0.022	ug/l	-28.10	277.78	7.087E-04	Pulse	0.30	3
Fe			2	492.548	ug/l	1.25	3,343,900.91	8.530E+00	Pulse	0.30	3
Co			2	0.027	ug/l	18.16	428.76	1.094E-03	Pulse	0.30	3
Ni			2	0.062	ug/l	12.68	274.45	6.998E-04	Pulse	0.30	3
Cu			2	0.051	ug/l	46.64	6,326.84	1.614E-02	Pulse	0.30	3
Zn			2	0.508	ug/l	7.31	1,118.94	2.854E-03	Pulse	0.30	3
As			2	0.031	ug/l	17.29	56.00	1.428E-04	Pulse	1.00	3
Cd			2	0.012	ug/l	30.75	45.33	1.892E-05	Pulse	0.30	3
Sn			2	1.007	ug/l	5.68	4,701.87	1.959E-03	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	199.168	ug/l	1.08	51,667.35	8.091E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,001,396.49	0.14	98.7	Pulse	0.10	3
1	Sc		6,147,972.82	1.29	98.9	Analog	0.10	3
1	Ge		1,197,420.45	0.78	98.9	Pulse	0.10	3
1	Ge		1,671,703.10	1.25	99.0	Pulse	0.10	3
1	Rh		9,016,644.03	0.98	96.9	Analog	0.10	3
1	In		9,392,382.94	1.72	98.0	Analog	0.10	3
1	Tb		14,226,093.12	1.31	98.0	Analog	0.10	3
1	Ho		14,470,966.03	1.35	97.8	Analog	0.10	3
1	Bi		9,131,775.91	1.74	98.0	Analog	0.10	3
2	Sc		392,039.47	0.48	100.1	Pulse	0.30	3
2	Ge		241,440.78	0.64	100.2	Pulse	0.30	3
2	Ge		364,068.21	0.81	100.2	Pulse	0.30	3
2	Rh		6,622,753.21	1.36	98.5	Analog	0.30	3
2	In		2,399,519.28	0.97	100.2	Pulse	0.30	3
2	Tb		9,037,026.31	1.31	98.6	Analog	0.30	3
2	Ho		9,276,609.36	0.39	98.4	Analog	0.30	3
2	Bi		6,302,084.89	1.14	97.8	Analog	0.30	3
3	Sc		677,252.98	0.46	100.6	Pulse	0.30	3
3	Ge		420,423.75	1.01	101.2	Pulse	0.30	3
3	Ge		638,603.43	1.16	101.4	Pulse	0.30	3
3	Rh		6,491,634.88	0.47	98.1	Analog	0.30	3
3	Tb		11,281,670.66	0.16	99.3	Analog	0.30	3

Quantitation Report

File Name	010CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 15:12
Sample Name	STDH
Sample Type	CalStd
Comment	1000MIN
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.000	ug/l	-456.02	33.33	1.108E-05	Pulse	0.25	3
B			1	5.640	ug/l	1.99	33,048.20	1.098E-02	Pulse	0.15	3
Ca			1	996.097	ug/l	0.52	829,588.01	1.348E-01	Pulse	0.10	3
Sr			1	0.015	ug/l	5.44	1,280.10	1.421E-04	Pulse	0.10	3
Mo			1	0.058	ug/l	20.04	566.70	6.282E-05	Pulse	0.10	3
Ag			1	0.282	ug/l	4.86	6,111.40	6.474E-04	Pulse	0.10	3
Sn			1	0.199	ug/l	5.83	3,897.31	4.128E-04	Pulse	0.10	3
Sb			1	0.744	ug/l	4.19	10,370.50	7.311E-04	Pulse	0.10	3
Ba			1	0.030	ug/l	33.26	270.01	1.904E-05	Pulse	0.10	3
Tl			1	0.008	ug/l	23.67	413.36	4.575E-05	Pulse	0.10	3
Pb			1	0.015	ug/l	30.98	546.70	6.052E-05	Pulse	0.10	3
Pb			1	0.013	ug/l	12.63	433.36	4.797E-05	Pulse	0.10	3
Pb			1	0.014	ug/l	19.66	2,086.81	2.310E-04	Pulse	0.10	3
Na			2	998.453	ug/l	0.21	1,430,024.67	3.667E+00	Pulse	0.30	3
Mg			2	1000.825	ug/l	0.46	676,116.19	1.734E+00	Pulse	0.30	3
Al			2	970.044	ug/l	0.42	228,486.83	5.859E-01	Pulse	0.30	3
K			2	1002.185	ug/l	0.79	499,275.01	1.280E+00	Pulse	0.30	3
Ca			2	1006.618	ug/l	0.77	26,211.88	6.721E-02	Pulse	0.30	3
Ti			2	-0.016	ug/l	-162.63	14.44	3.709E-05	Pulse	0.30	3
V			2	0.009	ug/l	107.07	294.45	7.549E-04	Pulse	0.30	3
Cr			2	0.041	ug/l	5.66	718.92	1.844E-03	Pulse	0.30	3
Mn			2	-0.037	ug/l	-17.80	203.34	5.211E-04	Pulse	0.30	3
Fe			2	1026.396	ug/l	1.21	6,927,167.92	1.776E+01	Analog	0.30	3
Co			2	0.043	ug/l	0.46	655.76	1.681E-03	Pulse	0.30	3
Ni			2	0.052	ug/l	9.12	234.45	6.013E-04	Pulse	0.30	3
Cu			2	0.000	ug/l	4384.92	5,776.64	1.481E-02	Pulse	0.30	3
Zn			2	0.170	ug/l	11.89	581.13	1.490E-03	Pulse	0.30	3
As			2	0.025	ug/l	14.72	51.00	1.308E-04	Pulse	1.00	3
Cd			2	0.004	ug/l	113.99	26.62	1.121E-05	Pulse	0.30	3
Sn			2	0.409	ug/l	5.86	1,754.57	7.392E-04	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	397.992	ug/l	0.70	102,455.37	1.616E-01	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,010,103.32	0.60	99.0	Pulse	0.10	3
1	Sc		6,152,705.32	0.61	99.0	Analog	0.10	3
1	Ge		1,190,482.30	1.19	98.3	Pulse	0.10	3
1	Ge		1,663,612.99	1.11	98.5	Pulse	0.10	3
1	Rh		9,011,915.70	1.98	96.8	Analog	0.10	3
1	In		9,440,359.27	0.69	98.5	Analog	0.10	3
1	Tb		14,180,337.29	1.24	97.7	Analog	0.10	3
1	Ho		14,479,313.11	0.43	97.8	Analog	0.10	3
1	Bi		9,033,384.04	0.25	96.9	Analog	0.10	3
2	Sc		389,999.24	0.70	99.5	Pulse	0.30	3
2	Ge		238,410.61	1.18	99.0	Pulse	0.30	3
2	Ge		359,262.57	0.72	98.8	Pulse	0.30	3
2	Rh		6,578,531.41	0.13	97.9	Analog	0.30	3
2	In		2,373,597.74	0.08	99.1	Pulse	0.30	3
2	Tb		9,038,154.08	0.18	98.6	Analog	0.30	3
2	Ho		9,193,067.69	0.61	97.5	Analog	0.30	3
2	Bi		6,243,922.25	1.25	96.9	Analog	0.30	3
3	Sc		672,706.85	1.11	99.9	Pulse	0.30	3
3	Ge		418,547.41	1.23	100.7	Pulse	0.30	3
3	Ge		633,859.04	0.99	100.7	Pulse	0.30	3
3	Rh		6,421,418.08	1.70	97.1	Analog	0.30	3
3	Tb		11,126,725.67	0.97	98.0	Analog	0.30	3

Quantitation Report

File Name	011CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 15:17
Sample Name	STDI
Sample Type	CalStd
Comment	5000MIN
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.000	ug/l	2741.35	36.00	1.191E-05	Pulse	0.25	3
B			1	2.873	ug/l	4.58	20,256.86	6.697E-03	Pulse	0.15	3
Ca			1	4827.277	ug/l	0.45	4,006,614.52	6.481E-01	Pulse	0.10	3
Sr			1	0.042	ug/l	11.36	2,453.62	2.764E-04	Pulse	0.10	3
Mo			1	0.034	ug/l	28.53	360.02	4.055E-05	Pulse	0.10	3
Ag			1	0.004	ug/l	16.22	126.67	1.354E-05	Pulse	0.10	3
Sn			1	0.118	ug/l	22.56	2,720.33	2.911E-04	Pulse	0.10	3
Sb			1	0.595	ug/l	5.05	7,942.32	5.564E-04	Pulse	0.10	3
Ba			1	0.010	ug/l	39.07	126.67	8.887E-06	Pulse	0.10	3
Tl			1	0.004	ug/l	5.00	206.68	2.337E-05	Pulse	0.10	3
Pb			1	0.007	ug/l	69.47	406.69	4.604E-05	Pulse	0.10	3
Pb			1	0.009	ug/l	37.63	373.36	4.223E-05	Pulse	0.10	3
Pb			1	0.010	ug/l	27.20	1,783.47	2.018E-04	Pulse	0.10	3
Na			2	5040.639	ug/l	1.05	7,267,973.60	1.838E+01	Analog	0.30	3
Mg			2	4890.630	ug/l	0.36	3,349,658.48	8.470E+00	Pulse	0.30	3
Al			2	4729.610	ug/l	0.89	1,129,529.88	2.856E+00	Pulse	0.30	3
K			2	4893.091	ug/l	0.91	2,422,001.98	6.124E+00	Pulse	0.30	3
Ca			2	4930.346	ug/l	0.73	129,800.91	3.282E-01	Pulse	0.30	3
Ti			2	-0.006	ug/l	-722.19	16.67	4.218E-05	Pulse	0.30	3
V			2	0.006	ug/l	75.80	283.34	7.166E-04	Pulse	0.30	3
Cr			2	0.050	ug/l	5.47	804.47	2.034E-03	Pulse	0.30	3
Mn			2	0.017	ug/l	43.34	462.23	1.169E-03	Pulse	0.30	3
Fe			2	4922.016	ug/l	1.40	33,670,693.11	8.514E+01	Analog	0.30	3
Co			2	0.208	ug/l	2.25	2,990.52	7.561E-03	Pulse	0.30	3
Ni			2	0.174	ug/l	11.39	700.02	1.770E-03	Pulse	0.30	3
Cu			2	-0.001	ug/l	-2622.35	5,847.78	1.479E-02	Pulse	0.30	3
Zn			2	0.230	ug/l	13.89	684.47	1.731E-03	Pulse	0.30	3
As			2	0.023	ug/l	32.49	50.00	1.264E-04	Pulse	1.00	3
Cd			2	0.001	ug/l	396.39	19.97	8.343E-06	Pulse	0.30	3
Sn			2	0.298	ug/l	5.66	1,223.40	5.130E-04	Pulse	0.30	3
Se			3	0.206	ug/l	10.29	78.93	1.264E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,024,935.90	0.36	99.5	Pulse	0.10	3
1	Sc		6,182,519.49	0.55	99.5	Analog	0.10	3
1	Ge		1,197,635.06	0.68	98.9	Pulse	0.10	3

Quantitation Report

1	Ge		1,661,527.63	0.18	98.4	Pulse	0.10	3
1	Rh		8,876,322.99	0.29	95.4	Analog	0.10	3
1	In		9,351,217.96	0.86	97.6	Analog	0.10	3
1	Tb		14,279,615.20	1.37	98.4	Analog	0.10	3
1	Ho		14,450,856.87	1.18	97.6	Analog	0.10	3
1	Bi		8,841,960.49	0.89	94.9	Analog	0.10	3
2	Sc		395,491.28	0.29	100.9	Pulse	0.30	3
2	Ge		241,056.95	0.57	100.0	Pulse	0.30	3
2	Ge		364,152.22	1.13	100.2	Pulse	0.30	3
2	Rh		6,457,951.27	0.31	96.1	Analog	0.30	3
2	In		2,384,410.35	0.85	99.5	Pulse	0.30	3
2	Tb		9,054,063.53	0.10	98.8	Analog	0.30	3
2	Ho		9,232,970.47	1.07	97.9	Analog	0.30	3
2	Bi		6,136,442.53	0.59	95.3	Analog	0.30	3
3	Sc		676,744.92	1.29	100.5	Pulse	0.30	3
3	Ge		416,476.01	1.34	100.2	Pulse	0.30	3
3	Ge		624,551.57	0.76	99.2	Pulse	0.30	3
3	Rh		6,273,360.03	0.93	94.8	Analog	0.30	3
3	Tb		11,087,562.34	0.69	97.6	Analog	0.30	3

Quantitation Report

File Name	012CALS.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 15:22
Sample Name	STDJ
Sample Type	CalStd
Comment	10000MIN
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.000	ug/l	503.44	36.00	1.196E-05	Pulse	0.25	3
B			1	1.749	ug/l	5.77	14,917.94	4.957E-03	Pulse	0.15	3
Ca			1	10164.311	ug/l	0.29	8,464,319.04	1.363E+00	Analog	0.10	3
Sr			1	0.078	ug/l	7.51	4,080.67	4.606E-04	Pulse	0.10	3
Mo			1	0.028	ug/l	15.46	313.35	3.539E-05	Pulse	0.10	3
Ag			1	0.005	ug/l	43.06	143.34	1.566E-05	Pulse	0.10	3
Sn			1	0.118	ug/l	6.26	2,667.00	2.917E-04	Pulse	0.10	3
Sb			1	0.503	ug/l	5.12	6,344.88	4.476E-04	Pulse	0.10	3
Ba			1	0.018	ug/l	3.44	183.34	1.293E-05	Pulse	0.10	3
Tl			1	0.004	ug/l	45.19	180.01	2.097E-05	Pulse	0.10	3
Pb			1	0.011	ug/l	34.50	460.03	5.356E-05	Pulse	0.10	3
Pb			1	0.015	ug/l	33.92	440.03	5.130E-05	Pulse	0.10	3
Pb			1	0.010	ug/l	18.16	1,730.11	2.016E-04	Pulse	0.10	3
Na			2	10963.194	ug/l	7.80	14,939,354.41	3.993E+01	Analog	0.30	3
Mg			2	11053.973	ug/l	9.40	7,156,038.32	1.914E+01	Analog	0.30	3
Al			2	10344.350	ug/l	7.68	2,337,046.16	6.246E+00	Pulse	0.30	3
K			2	11227.875	ug/l	7.65	5,241,972.01	1.401E+01	Analog	0.30	3
Ca			2	10783.057	ug/l	7.66	268,459.56	7.175E-01	Pulse	0.30	3
Ti			2	-0.036	ug/l	-173.04	10.00	2.704E-05	Pulse	0.30	3
V			2	0.006	ug/l	119.44	263.34	7.056E-04	Pulse	0.30	3
Cr			2	0.078	ug/l	23.44	992.27	2.662E-03	Pulse	0.30	3
Mn			2	0.105	ug/l	38.97	822.25	2.213E-03	Pulse	0.30	3
Fe			2	10529.918	ug/l	7.45	68,148,475.07	1.821E+02	Analog	0.30	3
Co			2	0.448	ug/l	11.32	6,026.13	1.614E-02	Pulse	0.30	3
Ni			2	0.381	ug/l	3.79	1,408.97	3.758E-03	Pulse	0.30	3
Cu			2	0.064	ug/l	90.49	6,164.57	1.649E-02	Pulse	0.30	3
Zn			2	0.441	ug/l	15.74	973.37	2.583E-03	Pulse	0.30	3
As			2	0.066	ug/l	1.88	80.67	2.148E-04	Pulse	1.00	3
Cd			2	0.001	ug/l	155.86	17.74	8.143E-06	Pulse	0.30	3
Sn			2	0.298	ug/l	12.03	1,111.16	5.121E-04	Pulse	0.30	3
Se			3	0.074	ug/l	15.09	45.27	7.299E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,009,571.78	0.28	98.9	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		6,209,885.12	0.60	99.9	Analog	0.10	3
1	Ge		1,185,922.38	0.48	98.0	Pulse	0.10	3
1	Ge		1,658,726.69	0.98	98.2	Pulse	0.10	3
1	Rh		8,854,737.78	1.19	95.1	Analog	0.10	3
1	In		9,144,348.25	0.77	95.4	Analog	0.10	3
1	Tb		14,174,901.46	0.80	97.7	Analog	0.10	3
1	Ho		14,387,275.62	1.01	97.2	Analog	0.10	3
1	Bi		8,581,022.58	1.01	92.1	Analog	0.10	3
2	Sc		375,566.00	7.44	95.9	Pulse	0.30	3
2	Ge		222,906.24	9.91	92.5	Pulse	0.30	3
2	Ge		337,519.32	9.78	92.8	Pulse	0.30	3
2	Rh		6,012,348.79	8.14	89.4	Analog	0.30	3
2	In		2,185,562.24	7.52	91.2	Pulse	0.30	3
2	Tb		8,457,458.00	7.90	92.3	Analog	0.30	3
2	Ho		8,577,692.99	6.88	91.0	Analog	0.30	3
2	Bi		5,585,147.14	8.58	86.7	Analog	0.30	3
3	Sc		672,663.48	1.18	99.9	Pulse	0.30	3
3	Ge		412,904.78	0.22	99.3	Pulse	0.30	3
3	Ge		620,302.25	0.60	98.5	Pulse	0.30	3
3	Rh		6,173,713.64	0.42	93.3	Analog	0.30	3
3	Tb		10,954,636.23	0.41	96.5	Analog	0.30	3

Quantitation Report

File Name	013SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 15:27
Sample Name	RINSECONF
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.002	ug/l	90.13	45.33	1.499E-05	Pulse	0.25	3
B			1	1.020	ug/l	5.12	11,573.10	3.828E-03	Pulse	0.15	3
Ca			1	0.600	ug/l	46.12	9,136.22	1.475E-03	Pulse	0.10	3
Sr			1	-0.001	ug/l	-66.08	546.70	6.009E-05	Pulse	0.10	3
Mo			1	0.002	ug/l	306.55	100.00	1.101E-05	Pulse	0.10	3
Ag			1	0.005	ug/l	55.80	136.67	1.439E-05	Pulse	0.10	3
Sn			1	0.045	ug/l	41.58	1,726.84	1.819E-04	Pulse	0.10	3
Sb			1	0.347	ug/l	2.23	3,723.90	2.644E-04	Pulse	0.10	3
Ba			1	0.004	ug/l	57.92	83.33	5.914E-06	Pulse	0.10	3
Tl			1	0.004	ug/l	11.02	190.01	2.102E-05	Pulse	0.10	3
Pb			1	0.003	ug/l	139.36	353.35	3.911E-05	Pulse	0.10	3
Pb			1	0.002	ug/l	167.40	270.01	2.986E-05	Pulse	0.10	3
Pb			1	0.000	ug/l	284.76	1,140.06	1.261E-04	Pulse	0.10	3
Na			2	0.649	ug/l	75.15	13,790.18	3.549E-02	Pulse	0.30	3
Mg			2	0.354	ug/l	12.38	443.34	1.142E-03	Pulse	0.30	3
Al			2	0.526	ug/l	16.39	167.78	4.322E-04	Pulse	0.30	3
K			2	0.475	ug/l	143.49	12,878.39	3.315E-02	Pulse	0.30	3
Ca			2	0.290	ug/l	294.83	106.67	2.746E-04	Pulse	0.30	3
Ti			2	0.007	ug/l	389.52	18.89	4.858E-05	Pulse	0.30	3
V			2	-0.004	ug/l	-77.50	211.11	5.435E-04	Pulse	0.30	3
Cr			2	0.003	ug/l	129.22	386.68	9.958E-04	Pulse	0.30	3
Mn			2	-0.058	ug/l	-7.47	105.56	2.716E-04	Pulse	0.30	3
Fe			2	1.932	ug/l	3.15	17,278.10	4.448E-02	Pulse	0.30	3
Co			2	0.000	ug/l	-600.40	46.62	1.197E-04	Pulse	0.30	3
Ni			2	0.003	ug/l	64.89	52.22	1.344E-04	Pulse	0.30	3
Cu			2	-0.125	ug/l	-15.43	4,473.98	1.152E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	-0.004	ug/l	-275.76	305.56	7.867E-04	Pulse	0.30	3
As			2	0.006	ug/l	214.61	35.33	9.083E-05	Pulse	1.00	3
Cd			2	-0.001	ug/l	-253.54	14.43	6.102E-06	Pulse	0.30	3
Sn			2	0.193	ug/l	11.03	706.69	2.990E-04	Pulse	0.30	3
Se			3	0.036	ug/l	13.61	35.67	5.744E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,023,028.20	0.77	99.4	Pulse	0.10	3
1	Sc		6,195,195.32	0.93	99.7	Analog	0.10	3
1	Ge		1,209,428.26	0.99	99.9	Pulse	0.10	3
1	Ge		1,685,994.20	0.64	99.8	Pulse	0.10	3
1	Rh		9,100,423.41	0.79	97.8	Analog	0.10	3
1	In		9,486,669.57	0.81	99.0	Analog	0.10	3
1	Tb		14,086,348.54	0.62	97.1	Analog	0.10	3
1	Ho		14,350,341.45	1.07	97.0	Analog	0.10	3
1	Bi		9,042,288.41	0.62	97.0	Analog	0.10	3
2	Sc		388,478.09	0.80	99.2	Pulse	0.30	3
2	Ge		239,896.68	0.16	99.6	Pulse	0.30	3
2	Ge		362,079.26	0.40	99.6	Pulse	0.30	3
2	Rh		6,646,321.96	1.00	98.9	Analog	0.30	3
2	In		2,364,048.21	0.23	98.7	Pulse	0.30	3
2	Tb		8,948,603.26	0.59	97.6	Analog	0.30	3
2	Ho		9,227,624.63	1.85	97.9	Analog	0.30	3
2	Bi		6,249,062.39	1.55	97.0	Analog	0.30	3
3	Sc		661,727.80	0.40	98.3	Pulse	0.30	3
3	Ge		413,631.90	0.25	99.5	Pulse	0.30	3
3	Ge		620,896.19	0.49	98.6	Pulse	0.30	3
3	Rh		6,364,626.55	0.71	96.2	Analog	0.30	3
3	Tb		10,883,937.34	0.13	95.8	Analog	0.30	3

Quantitation Report

File Name	014SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 15:32
Sample Name	ICVACONF
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	57.223	ug/l	1.09	371,249.63	1.212E-01	Pulse	0.25	3
B			1	111.338	ug/l	1.31	534,678.12	1.746E-01	Pulse	0.15	3
Ca			1	5006.455	ug/l	1.84	4,236,511.08	6.721E-01	Pulse	0.10	3
Sr			1	56.996	ug/l	1.19	2,591,330.22	2.881E-01	Pulse	0.10	3
Mo			1	59.929	ug/l	1.22	497,871.65	5.534E-02	Pulse	0.10	3
Ag			1	60.356	ug/l	2.46	1,288,241.28	1.380E-01	Pulse	0.10	3
Sn			1	58.677	ug/l	1.60	823,663.14	8.822E-02	Pulse	0.10	3
Sb			1	63.814	ug/l	2.34	1,063,478.92	7.485E-02	Pulse	0.10	3
Ba			1	58.148	ug/l	2.20	408,972.34	2.879E-02	Pulse	0.10	3
Tl			1	58.912	ug/l	1.78	2,834,957.46	3.184E-01	Pulse	0.10	3
Pb			1	57.999	ug/l	1.61	975,344.49	1.096E-01	Pulse	0.10	3
Pb			1	55.094	ug/l	1.69	807,136.84	9.066E-02	Pulse	0.10	3
Pb			1	56.337	ug/l	1.77	3,780,210.20	4.246E-01	Pulse	0.10	3
Na			2	5118.608	ug/l	1.01	7,508,689.14	1.866E+01	Analog	0.30	3
Mg			2	5072.751	ug/l	0.70	3,534,925.14	8.785E+00	Pulse	0.30	3
Al			2	5117.840	ug/l	1.06	1,243,513.32	3.090E+00	Pulse	0.30	3
K			2	5019.918	ug/l	0.43	2,527,788.58	6.282E+00	Pulse	0.30	3
Ca			2	5368.885	ug/l	0.44	143,802.41	3.574E-01	Pulse	0.30	3
Ti			2	57.880	ug/l	1.02	11,765.40	2.924E-02	Pulse	0.30	3
V			2	56.971	ug/l	0.33	394,792.79	9.811E-01	Pulse	0.30	3
Cr			2	55.758	ug/l	0.78	498,431.54	1.239E+00	Pulse	0.30	3
Mn			2	56.759	ug/l	0.67	271,223.24	6.741E-01	Pulse	0.30	3
Fe			2	4943.276	ug/l	0.58	34,405,998.63	8.551E+01	Analog	0.30	3
Co			2	55.491	ug/l	0.91	798,388.36	1.984E+00	Pulse	0.30	3
Ni			2	55.279	ug/l	1.22	213,089.37	5.296E-01	Pulse	0.30	3
Cu			2	54.798	ug/l	1.52	585,273.92	1.455E+00	Pulse	0.30	3
Zn			2	55.649	ug/l	0.58	90,731.29	2.255E-01	Pulse	0.30	3
As			2	60.303	ug/l	0.98	50,165.92	1.247E-01	Pulse	1.00	3
Cd			2	55.912	ug/l	1.39	138,091.18	5.701E-02	Pulse	0.30	3
Sn			2	58.181	ug/l	0.45	287,054.93	1.185E-01	Pulse	0.30	3
Se			3	250.956	ug/l	0.25	64,526.35	1.019E-01	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,062,536.26	1.10	100.7	Pulse	0.10	3
1	Sc		6,304,394.28	1.12	101.4	Analog	0.10	3
1	Ge		1,227,777.25	1.91	101.4	Pulse	0.10	3

Quantitation Report

1	Ge		1,721,997.16	2.06	101.9	Pulse	0.10	3
1	Rh		8,995,202.16	1.23	96.6	Analog	0.10	3
1	In		9,336,195.65	0.96	97.4	Analog	0.10	3
1	Tb		14,206,836.46	0.35	97.9	Analog	0.10	3
1	Ho		14,379,728.95	0.61	97.2	Analog	0.10	3
1	Bi		8,902,885.91	1.46	95.5	Analog	0.10	3
2	Sc		402,393.38	0.88	102.7	Pulse	0.30	3
2	Ge		246,624.39	1.03	102.4	Pulse	0.30	3
2	Ge		372,072.23	0.45	102.4	Pulse	0.30	3
2	Rh		6,505,957.38	0.56	96.8	Analog	0.30	3
2	In		2,422,328.69	0.42	101.1	Pulse	0.30	3
2	Tb		9,094,192.14	0.39	99.2	Analog	0.30	3
2	Ho		9,280,387.41	0.24	98.4	Analog	0.30	3
2	Bi		6,110,598.65	0.82	94.9	Analog	0.30	3
3	Sc		677,091.52	0.59	100.6	Pulse	0.30	3
3	Ge		419,181.97	0.45	100.9	Pulse	0.30	3
3	Ge		632,974.92	0.42	100.5	Pulse	0.30	3
3	Rh		6,212,073.78	0.65	93.9	Analog	0.30	3
3	Tb		10,936,169.01	1.48	96.3	Analog	0.30	3

Quantitation Report

File Name	015SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 15:36
Sample Name	ICV
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.005	ug/l	57.75	66.67	2.233E-05	Pulse	0.25	3
B			1	2.700	ug/l	5.44	19,184.54	6.429E-03	Pulse	0.15	3
Ca			1	0.852	ug/l	29.72	9,312.95	1.508E-03	Pulse	0.10	3
Sr			1	0.003	ug/l	48.57	740.04	8.053E-05	Pulse	0.10	3
Mo			1	0.149	ug/l	10.37	1,350.11	1.469E-04	Pulse	0.10	3
Ag			1	0.012	ug/l	43.88	293.35	3.132E-05	Pulse	0.10	3
Sn			1	0.218	ug/l	7.89	4,137.38	4.416E-04	Pulse	0.10	3
Sb			1	0.316	ug/l	4.61	3,190.44	2.287E-04	Pulse	0.10	3
Ba			1	0.010	ug/l	52.46	123.34	8.842E-06	Pulse	0.10	3
Tl			1	0.011	ug/l	10.60	520.03	5.819E-05	Pulse	0.10	3
Pb			1	0.011	ug/l	19.71	473.36	5.295E-05	Pulse	0.10	3
Pb			1	0.013	ug/l	56.12	430.02	4.813E-05	Pulse	0.10	3
Pb			1	0.013	ug/l	8.75	2,010.14	2.249E-04	Pulse	0.10	3
Na			2	1.469	ug/l	13.74	15,069.04	3.847E-02	Pulse	0.30	3
Mg			2	0.524	ug/l	13.88	562.24	1.436E-03	Pulse	0.30	3
Al			2	61.481	ug/l	2.00	14,586.40	3.724E-02	Pulse	0.30	3
K			2	-1.412	ug/l	-30.69	12,065.57	3.081E-02	Pulse	0.30	3
Ca			2	1.241	ug/l	95.87	132.22	3.379E-04	Pulse	0.30	3
Ti			2	0.034	ug/l	126.73	24.44	6.248E-05	Pulse	0.30	3
V			2	-0.001	ug/l	-427.26	227.78	5.813E-04	Pulse	0.30	3
Cr			2	0.081	ug/l	6.68	1,062.27	2.712E-03	Pulse	0.30	3
Mn			2	-0.056	ug/l	-6.90	115.56	2.950E-04	Pulse	0.30	3
Fe			2	2.520	ug/l	6.77	21,410.68	5.466E-02	Pulse	0.30	3
Co			2	0.002	ug/l	43.84	83.28	2.126E-04	Pulse	0.30	3
Ni			2	0.014	ug/l	27.70	93.33	2.383E-04	Pulse	0.30	3
Cu			2	-0.148	ug/l	-3.72	4,276.16	1.092E-02	Pulse	0.30	3
Zn			2	0.091	ug/l	15.14	458.90	1.171E-03	Pulse	0.30	3
As			2	0.027	ug/l	21.63	53.00	1.353E-04	Pulse	1.00	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Cd			2	0.006	ug/l	103.49	30.97	1.296E-05	Pulse	0.30	3
Sn			2	0.421	ug/l	1.57	1,821.24	7.633E-04	Pulse	0.30	3
Se			3	0.123	ug/l	13.35	57.80	9.288E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,984,303.45	0.31	98.1	Pulse	0.10	3
1	Sc		6,174,599.70	0.22	99.3	Analog	0.10	3
1	Ge		1,198,946.99	1.58	99.0	Pulse	0.10	3
1	Ge		1,675,637.68	0.77	99.2	Pulse	0.10	3
1	Rh		9,185,778.82	0.64	98.7	Analog	0.10	3
1	In		9,367,729.55	0.66	97.8	Analog	0.10	3
1	Tb		13,947,103.12	1.03	96.1	Analog	0.10	3
1	Ho		14,324,582.71	0.58	96.8	Analog	0.10	3
1	Bi		8,940,381.53	0.47	95.9	Analog	0.10	3
2	Sc		391,699.28	0.69	100.0	Pulse	0.30	3
2	Ge		242,175.90	0.49	100.5	Pulse	0.30	3
2	Ge		364,039.88	0.50	100.1	Pulse	0.30	3
2	Rh		6,710,413.35	1.03	99.8	Analog	0.30	3
2	In		2,385,954.28	0.60	99.6	Pulse	0.30	3
2	Tb		9,077,166.58	1.02	99.0	Analog	0.30	3
2	Ho		9,279,570.19	0.23	98.4	Analog	0.30	3
2	Bi		6,319,742.53	0.77	98.1	Analog	0.30	3
3	Sc		663,640.60	0.18	98.6	Pulse	0.30	3
3	Ge		412,226.19	1.10	99.2	Pulse	0.30	3
3	Ge		622,518.10	0.77	98.9	Pulse	0.30	3
3	Rh		6,456,592.80	0.29	97.6	Analog	0.30	3
3	Tb		11,096,694.01	0.36	97.7	Analog	0.30	3

Quantitation Report

File Name	016SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 15:43
Sample Name	ICVA
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	59.932	ug/l	1.34	386,930.49	1.270E-01	Pulse	0.25	3
B			1	115.382	ug/l	0.95	551,098.03	1.808E-01	Pulse	0.15	3
Ca			1	5161.392	ug/l	1.12	4,356,706.08	6.928E-01	Pulse	0.10	3
Sr			1	59.649	ug/l	3.13	2,723,461.73	3.015E-01	Pulse	0.10	3
Mo			1	62.922	ug/l	2.12	524,992.28	5.811E-02	Pulse	0.10	3
Ag			1	62.614	ug/l	2.02	1,332,132.09	1.431E-01	Pulse	0.10	3
Sn			1	60.688	ug/l	2.89	849,165.07	9.124E-02	Pulse	0.10	3
Sb			1	65.750	ug/l	2.53	1,084,890.43	7.713E-02	Pulse	0.10	3
Ba			1	60.536	ug/l	3.19	421,523.87	2.997E-02	Pulse	0.10	3
Tl			1	61.621	ug/l	2.09	2,903,351.93	3.331E-01	Pulse	0.10	3
Pb			1	61.112	ug/l	2.15	1,006,250.53	1.154E-01	Pulse	0.10	3
Pb			1	57.648	ug/l	1.75	826,881.42	9.486E-02	Pulse	0.10	3
Pb			1	59.044	ug/l	1.86	3,879,000.93	4.450E-01	Pulse	0.10	3
Na			2	5194.242	ug/l	0.41	7,698,187.47	1.894E+01	Analog	0.30	3
Mg			2	5192.749	ug/l	0.85	3,655,876.38	8.993E+00	Pulse	0.30	3
Al			2	5242.583	ug/l	0.59	1,286,980.30	3.166E+00	Pulse	0.30	3
K			2	5153.351	ug/l	0.99	2,621,308.37	6.448E+00	Pulse	0.30	3
Ca			2	5474.953	ug/l	1.13	148,149.40	3.644E-01	Pulse	0.30	3
Ti			2	59.645	ug/l	0.44	12,249.10	3.013E-02	Pulse	0.30	3
V			2	59.329	ug/l	0.29	415,357.08	1.022E+00	Pulse	0.30	3
Cr			2	57.760	ug/l	0.28	521,646.13	1.283E+00	Pulse	0.30	3
Mn			2	58.530	ug/l	0.98	282,559.53	6.951E-01	Pulse	0.30	3
Fe			2	5061.934	ug/l	0.76	35,594,565.25	8.756E+01	Analog	0.30	3
Co			2	57.474	ug/l	0.73	835,464.60	2.055E+00	Pulse	0.30	3
Ni			2	57.037	ug/l	1.69	222,141.68	5.464E-01	Pulse	0.30	3
Cu			2	56.420	ug/l	0.89	608,654.07	1.497E+00	Pulse	0.30	3
Zn			2	57.577	ug/l	1.42	94,828.44	2.333E-01	Pulse	0.30	3
As			2	62.603	ug/l	1.03	52,616.51	1.294E-01	Pulse	1.00	3
Cd			2	58.220	ug/l	1.22	143,707.31	5.936E-02	Pulse	0.30	3
Sn			2	61.195	ug/l	0.76	301,773.76	1.246E-01	Pulse	0.30	3
Se			3	253.710	ug/l	1.19	65,459.09	1.031E-01	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,047,616.88	0.29	100.2	Pulse	0.10	3
1	Sc		6,288,270.12	0.63	101.2	Analog	0.10	3
1	Ge		1,228,070.71	2.31	101.4	Pulse	0.10	3

Quantitation Report

1	Ge		1,721,499.04	1.42	101.9	Pulse	0.10	3
1	Rh		9,035,383.61	0.74	97.1	Analog	0.10	3
1	In		9,306,560.23	0.24	97.1	Analog	0.10	3
1	Tb		14,066,649.79	0.32	96.9	Analog	0.10	3
1	Ho		14,391,062.70	0.64	97.2	Analog	0.10	3
1	Bi		8,716,167.99	1.14	93.5	Analog	0.10	3
2	Sc		406,530.66	0.36	103.8	Pulse	0.30	3
2	Ge		248,583.30	0.94	103.2	Pulse	0.30	3
2	Ge		374,104.36	0.56	102.9	Pulse	0.30	3
2	Rh		6,518,678.77	0.47	97.0	Analog	0.30	3
2	In		2,421,102.40	1.13	101.1	Pulse	0.30	3
2	Tb		9,009,362.14	1.15	98.3	Analog	0.30	3
2	Ho		9,312,952.69	0.54	98.8	Analog	0.30	3
2	Bi		6,097,639.62	0.29	94.7	Analog	0.30	3
3	Sc		680,687.42	1.21	101.1	Pulse	0.30	3
3	Ge		422,001.87	0.56	101.5	Pulse	0.30	3
3	Ge		635,182.79	0.74	100.9	Pulse	0.30	3
3	Rh		6,285,221.28	1.00	95.0	Analog	0.30	3
3	Tb		11,001,775.12	2.56	96.9	Analog	0.30	3

Quantitation Report

File Name	017_CCB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 15:49
Sample Name	ICB
Sample Type	CCB
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.003	ug/l	12.12	57.33	1.890E-05	Pulse	0.25	3
B			1	2.415	ug/l	1.94	18,161.13	5.987E-03	Pulse	0.15	3
Ca			1	-0.478	ug/l	-79.59	8,382.41	1.330E-03	Pulse	0.10	3
Sr			1	0.000	ug/l	-583.02	600.04	6.489E-05	Pulse	0.10	3
Mo			1	0.080	ug/l	10.89	773.39	8.363E-05	Pulse	0.10	3
Ag			1	0.010	ug/l	33.25	243.34	2.568E-05	Pulse	0.10	3
Sn			1	0.125	ug/l	9.55	2,847.05	3.010E-04	Pulse	0.10	3
Sb			1	0.298	ug/l	2.67	2,980.39	2.067E-04	Pulse	0.10	3
Ba			1	0.003	ug/l	45.40	80.00	5.545E-06	Pulse	0.10	3
Tl			1	0.008	ug/l	16.07	366.68	4.057E-05	Pulse	0.10	3
Pb			1	0.011	ug/l	29.22	486.69	5.381E-05	Pulse	0.10	3
Pb			1	0.010	ug/l	32.20	386.69	4.275E-05	Pulse	0.10	3
Pb			1	0.011	ug/l	15.53	1,886.79	2.086E-04	Pulse	0.10	3
Na			2	0.214	ug/l	152.01	13,404.13	3.390E-02	Pulse	0.30	3
Mg			2	0.262	ug/l	14.48	387.79	9.812E-04	Pulse	0.30	3
Al			2	0.252	ug/l	36.03	105.56	2.668E-04	Pulse	0.30	3
K			2	-0.680	ug/l	-117.50	12,539.25	3.172E-02	Pulse	0.30	3
Ca			2	0.601	ug/l	172.26	116.67	2.953E-04	Pulse	0.30	3
Ti			2	0.021	ug/l	313.16	22.22	5.609E-05	Pulse	0.30	3
V			2	0.001	ug/l	638.84	246.67	6.243E-04	Pulse	0.30	3
Cr			2	0.010	ug/l	35.75	452.24	1.144E-03	Pulse	0.30	3
Mn			2	-0.056	ug/l	-5.68	121.11	3.062E-04	Pulse	0.30	3
Fe			2	1.418	ug/l	6.13	14,072.79	3.559E-02	Pulse	0.30	3
Co			2	0.001	ug/l	150.08	69.96	1.767E-04	Pulse	0.30	3
Ni			2	0.006	ug/l	106.90	65.55	1.660E-04	Pulse	0.30	3
Cu			2	-0.151	ug/l	-9.26	4,287.28	1.084E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	-0.011	ug/l	-366.29	300.01	7.583E-04	Pulse	0.30	3
As			2	0.014	ug/l	27.21	43.00	1.088E-04	Pulse	1.00	3
Cd			2	0.003	ug/l	49.11	23.26	9.656E-06	Pulse	0.30	3
Sn			2	0.320	ug/l	5.20	1,341.19	5.572E-04	Pulse	0.30	3
Se			3	0.083	ug/l	6.22	47.93	7.641E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,033,411.41	0.80	99.7	Pulse	0.10	3
1	Sc		6,301,915.32	0.45	101.4	Analog	0.10	3
1	Ge		1,210,603.26	0.72	100.0	Pulse	0.10	3
1	Ge		1,696,717.84	0.72	100.4	Pulse	0.10	3
1	Rh		9,240,524.45	1.57	99.3	Analog	0.10	3
1	In		9,460,458.76	1.12	98.7	Analog	0.10	3
1	Tb		14,420,939.78	0.87	99.4	Analog	0.10	3
1	Ho		14,507,961.03	0.91	98.0	Analog	0.10	3
1	Bi		9,043,009.45	0.54	97.0	Analog	0.10	3
2	Sc		395,318.57	0.58	100.9	Pulse	0.30	3
2	Ge		242,805.66	0.09	100.8	Pulse	0.30	3
2	Ge		365,253.03	0.08	100.5	Pulse	0.30	3
2	Rh		6,761,394.32	0.61	100.6	Analog	0.30	3
2	In		2,407,267.34	0.61	100.5	Pulse	0.30	3
2	Tb		9,227,452.97	0.22	100.7	Analog	0.30	3
2	Ho		9,414,687.13	0.95	99.9	Analog	0.30	3
2	Bi		6,329,462.11	0.50	98.3	Analog	0.30	3
3	Sc		669,405.23	0.93	99.4	Pulse	0.30	3
3	Ge		416,483.09	0.20	100.2	Pulse	0.30	3
3	Ge		627,286.28	0.53	99.6	Pulse	0.30	3
3	Rh		6,392,282.52	0.20	96.6	Analog	0.30	3
3	Tb		10,997,281.51	0.60	96.8	Analog	0.30	3

Quantitation Report

File Name	018_CCV.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 15:54
Sample Name	CCVA
Sample Type	CCV
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	50.664	ug/l	0.58	330,009.58	1.073E-01	Pulse	0.25	3
B			1	103.762	ug/l	1.28	500,735.38	1.628E-01	Pulse	0.15	3
Ca			1	4968.495	ug/l	1.63	4,216,195.77	6.670E-01	Pulse	0.10	3
Sr			1	49.861	ug/l	1.96	2,310,930.85	2.520E-01	Pulse	0.10	3
Mo			1	50.758	ug/l	2.21	429,858.74	4.688E-02	Pulse	0.10	3
Ag			1	50.460	ug/l	0.66	1,090,013.97	1.154E-01	Pulse	0.10	3
Sn			1	48.683	ug/l	2.22	691,898.37	7.321E-02	Pulse	0.10	3
Sb			1	50.190	ug/l	1.92	845,325.46	5.884E-02	Pulse	0.10	3
Ba			1	49.127	ug/l	2.21	349,386.00	2.432E-02	Pulse	0.10	3
Tl			1	49.586	ug/l	1.93	2,352,942.05	2.680E-01	Pulse	0.10	3
Pb			1	49.499	ug/l	0.96	820,801.50	9.350E-02	Pulse	0.10	3
Pb			1	49.719	ug/l	1.38	718,239.52	8.182E-02	Pulse	0.10	3
Pb			1	49.411	ug/l	1.41	3,269,212.19	3.724E-01	Pulse	0.10	3
Na			2	4959.847	ug/l	0.37	7,401,783.59	1.808E+01	Analog	0.30	3
Mg			2	4888.538	ug/l	0.58	3,465,234.45	8.466E+00	Pulse	0.30	3
Al			2	4747.708	ug/l	0.56	1,173,473.18	2.867E+00	Pulse	0.30	3
K			2	4948.573	ug/l	0.24	2,534,934.21	6.193E+00	Pulse	0.30	3
Ca			2	5224.103	ug/l	0.69	142,336.36	3.477E-01	Pulse	0.30	3
Ti			2	48.147	ug/l	2.40	9,958.65	2.433E-02	Pulse	0.30	3
V			2	49.069	ug/l	0.79	345,915.00	8.451E-01	Pulse	0.30	3
Cr			2	48.663	ug/l	0.84	442,548.00	1.081E+00	Pulse	0.30	3
Mn			2	48.702	ug/l	0.52	236,788.72	5.785E-01	Pulse	0.30	3
Fe			2	4837.469	ug/l	0.14	34,249,551.97	8.368E+01	Analog	0.30	3
Co			2	47.958	ug/l	1.10	701,908.85	1.715E+00	Pulse	0.30	3
Ni			2	47.469	ug/l	0.94	186,146.30	4.548E-01	Pulse	0.30	3
Cu			2	47.482	ug/l	0.32	516,695.71	1.262E+00	Pulse	0.30	3
Zn			2	47.258	ug/l	0.22	78,426.32	1.916E-01	Pulse	0.30	3
As			2	49.184	ug/l	0.48	41,627.07	1.017E-01	Pulse	1.00	3
Cd			2	48.113	ug/l	1.20	119,670.09	4.906E-02	Pulse	0.30	3
Sn			2	48.981	ug/l	0.14	243,335.50	9.975E-02	Pulse	0.30	3
Se			3	203.093	ug/l	0.63	52,187.93	8.251E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,074,604.82	1.20	101.1	Pulse	0.10	3
1	Sc		6,320,922.83	0.82	101.7	Analog	0.10	3
1	Ge		1,234,445.19	2.24	102.0	Pulse	0.10	3

Quantitation Report

1	Ge		1,719,292.06	1.80	101.8	Pulse	0.10	3
1	Rh		9,170,851.95	0.65	98.5	Analog	0.10	3
1	In		9,448,945.55	0.98	98.6	Analog	0.10	3
1	Tb		14,365,323.54	0.64	99.0	Analog	0.10	3
1	Ho		14,639,808.53	0.95	98.9	Analog	0.10	3
1	Bi		8,777,678.41	1.25	94.2	Analog	0.10	3
2	Sc		409,311.67	0.31	104.5	Pulse	0.30	3
2	Ge		248,373.97	0.63	103.1	Pulse	0.30	3
2	Ge		375,024.66	0.73	103.2	Pulse	0.30	3
2	Rh		6,617,066.40	0.95	98.4	Analog	0.30	3
2	In		2,439,425.92	0.36	101.8	Pulse	0.30	3
2	Tb		9,138,611.30	0.78	99.7	Analog	0.30	3
2	Ho		9,320,602.13	0.74	98.9	Analog	0.30	3
2	Bi		6,162,428.51	0.41	95.7	Analog	0.30	3
3	Sc		675,471.82	1.23	100.3	Pulse	0.30	3
3	Ge		421,037.50	0.88	101.3	Pulse	0.30	3
3	Ge		632,520.48	0.32	100.5	Pulse	0.30	3
3	Rh		6,277,446.83	1.69	94.9	Analog	0.30	3
3	Tb		11,045,864.56	0.43	97.3	Analog	0.30	3

Quantitation Report

File Name	019_CCB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 15:59
Sample Name	CCB
Sample Type	CCB
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.005	ug/l	56.28	65.33	2.124E-05	Pulse	0.25	3
B			1	3.117	ug/l	1.84	21,785.44	7.075E-03	Pulse	0.15	3
Ca			1	0.630	ug/l	27.33	9,299.63	1.478E-03	Pulse	0.10	3
Sr			1	0.002	ug/l	188.60	686.71	7.402E-05	Pulse	0.10	3
Mo			1	0.165	ug/l	19.17	1,503.46	1.620E-04	Pulse	0.10	3
Ag			1	0.014	ug/l	11.02	340.02	3.574E-05	Pulse	0.10	3
Sn			1	0.251	ug/l	12.50	4,664.23	4.904E-04	Pulse	0.10	3
Sb			1	0.679	ug/l	5.86	9,359.87	6.550E-04	Pulse	0.10	3
Ba			1	0.004	ug/l	121.48	83.33	5.827E-06	Pulse	0.10	3
Tl			1	0.010	ug/l	2.91	493.36	5.448E-05	Pulse	0.10	3
Pb			1	0.016	ug/l	14.82	573.37	6.332E-05	Pulse	0.10	3
Pb			1	0.012	ug/l	38.73	426.70	4.707E-05	Pulse	0.10	3
Pb			1	0.017	ug/l	17.03	2,256.83	2.490E-04	Pulse	0.10	3
Na			2	-0.143	ug/l	-115.65	13,014.01	3.261E-02	Pulse	0.30	3
Mg			2	0.322	ug/l	16.95	433.35	1.086E-03	Pulse	0.30	3
Al			2	0.424	ug/l	11.34	147.78	3.703E-04	Pulse	0.30	3
K			2	-0.635	ug/l	-61.05	12,680.46	3.177E-02	Pulse	0.30	3
Ca			2	-0.029	ug/l	-1269.45	101.11	2.534E-04	Pulse	0.30	3
Ti			2	-0.012	ug/l	-426.50	15.55	3.897E-05	Pulse	0.30	3
V			2	-0.001	ug/l	-748.13	234.45	5.873E-04	Pulse	0.30	3
Cr			2	0.007	ug/l	92.97	434.46	1.089E-03	Pulse	0.30	3
Mn			2	-0.058	ug/l	-1.94	111.11	2.784E-04	Pulse	0.30	3
Fe			2	1.840	ug/l	4.05	17,118.06	4.289E-02	Pulse	0.30	3
Co			2	0.001	ug/l	110.03	69.95	1.752E-04	Pulse	0.30	3
Ni			2	0.009	ug/l	40.97	74.45	1.865E-04	Pulse	0.30	3
Cu			2	-0.179	ug/l	-5.48	4,029.43	1.010E-02	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	0.018	ug/l	75.92	348.90	8.742E-04	Pulse	0.30	3
As			2	0.015	ug/l	21.46	44.00	1.102E-04	Pulse	1.00	3
Cd			2	0.002	ug/l	131.03	22.04	9.177E-06	Pulse	0.30	3
Sn			2	0.523	ug/l	4.74	2,337.98	9.727E-04	Pulse	0.30	3
Se			3	0.142	ug/l	7.82	62.87	1.006E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,079,312.84	0.74	101.2	Pulse	0.10	3
1	Sc		6,289,861.16	1.66	101.2	Analog	0.10	3
1	Ge		1,224,726.52	2.04	101.2	Pulse	0.10	3
1	Ge		1,716,844.98	1.59	101.6	Pulse	0.10	3
1	Rh		9,283,128.82	0.47	99.7	Analog	0.10	3
1	In		9,509,151.43	0.81	99.2	Analog	0.10	3
1	Tb		14,285,645.62	0.86	98.4	Analog	0.10	3
1	Ho		14,388,941.45	1.13	97.2	Analog	0.10	3
1	Bi		9,055,560.28	1.33	97.2	Analog	0.10	3
2	Sc		399,113.54	0.32	101.9	Pulse	0.30	3
2	Ge		245,371.28	0.61	101.8	Pulse	0.30	3
2	Ge		367,430.16	0.54	101.1	Pulse	0.30	3
2	Rh		6,779,959.04	0.78	100.8	Analog	0.30	3
2	In		2,403,509.81	0.28	100.3	Pulse	0.30	3
2	Tb		9,108,676.30	0.65	99.4	Analog	0.30	3
2	Ho		9,350,724.63	0.34	99.2	Analog	0.30	3
2	Bi		6,340,603.64	0.67	98.4	Analog	0.30	3
3	Sc		660,942.61	0.42	98.2	Pulse	0.30	3
3	Ge		414,012.02	1.20	99.6	Pulse	0.30	3
3	Ge		625,066.16	0.65	99.3	Pulse	0.30	3
3	Rh		6,446,053.91	0.60	97.5	Analog	0.30	3
3	Tb		10,897,321.23	1.38	96.0	Analog	0.30	3

Quantitation Report

File Name	020LCCV.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 16:04
Sample Name	CRI
Sample Type	LLCCV
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.456	ug/l	4.45	2,989.63	9.767E-04	Pulse	0.25	3
B			1	24.694	ug/l	1.04	123,868.44	4.047E-02	Pulse	0.15	3
Ca			1	239.537	ug/l	0.80	210,356.57	3.348E-02	Pulse	0.10	3
Sr			1	4.456	ug/l	1.95	207,818.76	2.258E-02	Pulse	0.10	3
Mo			1	0.938	ug/l	3.15	8,058.97	8.760E-04	Pulse	0.10	3
Ag			1	0.472	ug/l	3.41	10,267.04	1.083E-03	Pulse	0.10	3
Sn			1	4.661	ug/l	0.90	67,408.40	7.112E-03	Pulse	0.10	3
Sb			1	2.278	ug/l	1.01	35,912.14	2.534E-03	Pulse	0.10	3
Ba			1	0.918	ug/l	8.37	6,498.28	4.586E-04	Pulse	0.10	3
Tl			1	0.449	ug/l	1.75	21,546.28	2.425E-03	Pulse	0.10	3
Pb			1	0.442	ug/l	5.09	7,712.33	8.680E-04	Pulse	0.10	3
Pb			1	0.441	ug/l	3.56	6,688.42	7.528E-04	Pulse	0.10	3
Pb			1	0.446	ug/l	1.00	30,930.47	3.481E-03	Pulse	0.10	3
Na			2	243.343	ug/l	2.05	363,444.24	9.187E-01	Pulse	0.30	3
Mg			2	244.853	ug/l	0.77	167,958.05	4.245E-01	Pulse	0.30	3
Al			2	25.183	ug/l	2.22	6,061.17	1.532E-02	Pulse	0.30	3
K			2	245.800	ug/l	0.37	133,946.61	3.386E-01	Pulse	0.30	3
Ca			2	266.434	ug/l	3.35	7,113.83	1.798E-02	Pulse	0.30	3
Ti			2	1.179	ug/l	19.06	253.34	6.401E-04	Pulse	0.30	3
V			2	0.882	ug/l	3.53	6,249.03	1.579E-02	Pulse	0.30	3
Cr			2	0.926	ug/l	1.10	8,500.05	2.148E-02	Pulse	0.30	3
Mn			2	0.853	ug/l	1.48	4,381.75	1.108E-02	Pulse	0.30	3
Fe			2	25.499	ug/l	0.11	178,857.17	4.521E-01	Pulse	0.30	3
Co			2	0.446	ug/l	3.97	6,355.26	1.606E-02	Pulse	0.30	3
Ni			2	0.902	ug/l	1.68	3,460.41	8.747E-03	Pulse	0.30	3
Cu			2	1.626	ug/l	0.66	22,761.45	5.753E-02	Pulse	0.30	3
Zn			2	4.447	ug/l	5.71	7,419.55	1.876E-02	Pulse	0.30	3
As			2	0.507	ug/l	4.95	445.68	1.127E-03	Pulse	1.00	3
Cd			2	0.454	ug/l	7.11	1,119.39	4.701E-04	Pulse	0.30	3
Sn			2	4.811	ug/l	2.13	23,129.34	9.712E-03	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	0.559	ug/l	3.29	168.40	2.698E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		3,060,737.64	0.36	100.6	Pulse	0.10	3
1	Sc		6,283,011.57	1.74	101.1	Analog	0.10	3
1	Ge		1,206,247.09	1.03	99.6	Pulse	0.10	3
1	Ge		1,693,054.72	1.29	100.2	Pulse	0.10	3
1	Rh		9,201,965.28	1.33	98.9	Analog	0.10	3
1	In		9,477,313.05	0.61	98.9	Analog	0.10	3
1	Tb		14,173,703.96	0.49	97.7	Analog	0.10	3
1	Ho		14,369,027.29	1.25	97.1	Analog	0.10	3
1	Bi		8,885,170.49	0.26	95.4	Analog	0.10	3
2	Sc		395,635.12	0.81	101.0	Pulse	0.30	3
2	Ge		242,293.30	0.54	100.6	Pulse	0.30	3
2	Ge		363,999.91	0.84	100.1	Pulse	0.30	3
2	Rh		6,616,355.02	1.22	98.4	Analog	0.30	3
2	In		2,381,790.31	0.93	99.4	Pulse	0.30	3
2	Tb		9,165,249.36	0.57	100.0	Analog	0.30	3
2	Ho		9,312,012.96	0.17	98.8	Analog	0.30	3
2	Bi		6,275,935.59	0.54	97.4	Analog	0.30	3
3	Sc		661,523.44	1.01	98.3	Pulse	0.30	3
3	Ge		416,455.31	0.20	100.2	Pulse	0.30	3
3	Ge		624,115.74	0.65	99.1	Pulse	0.30	3
3	Rh		6,430,215.16	0.86	97.2	Analog	0.30	3
3	Tb		11,002,100.40	1.35	96.9	Analog	0.30	3

Quantitation Report

File Name	021ICSA.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 16:13
Sample Name	ICSA
Sample Type	ICSA
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.003	ug/l	123.66	50.67	1.787E-05	Pulse	0.25	3
B			1	1.519	ug/l	6.29	13,007.45	4.601E-03	Pulse	0.15	3
Ca			1	95759.663	ug/l	0.91	77,513,403.85	1.283E+01	Analog	0.10	3
Sr			1	2056.179	ug/l	0.75	83,065,627.10	1.039E+01	Analog	0.10	3
Mo			1	2159.679	ug/l	0.86	15,942,393.93	1.994E+00	Analog	0.10	3
Ag			1	0.031	ug/l	17.72	616.70	7.533E-05	Pulse	0.10	3
Sn			1	2039.760	ug/l	0.48	25,068,662.13	3.063E+00	Analog	0.10	3
Sb			1	0.557	ug/l	4.33	6,871.75	5.112E-04	Pulse	0.10	3
Ba			1	0.210	ug/l	3.65	1,453.46	1.081E-04	Pulse	0.10	3
Tl			1	0.008	ug/l	22.87	326.68	4.280E-05	Pulse	0.10	3
Pb			1	0.099	ug/l	2.55	1,673.49	2.196E-04	Pulse	0.10	3
Pb			1	0.071	ug/l	13.33	1,100.09	1.444E-04	Pulse	0.10	3
Pb			1	0.091	ug/l	2.18	6,170.78	8.096E-04	Pulse	0.10	3
Na			2	96163.880	ug/l	1.61	137,524,967.87	3.500E+02	Analog	0.30	3
Mg			2	95664.237	ug/l	1.03	65,095,788.52	1.657E+02	Analog	0.30	3
Al			2	96889.483	ug/l	1.00	22,989,592.98	5.851E+01	Analog	0.30	3
K			2	99648.772	ug/l	1.39	48,758,491.39	1.241E+02	Analog	0.30	3
Ca			2	104302.836	ug/l	0.52	2,726,389.75	6.938E+00	Pulse	0.30	3
Ti			2	1852.381	ug/l	0.26	367,190.10	9.344E-01	Pulse	0.30	3
V			2	0.024	ug/l	23.99	402.23	1.024E-03	Pulse	0.30	3
Cr			2	0.762	ug/l	1.06	7,009.34	1.784E-02	Pulse	0.30	3
Mn			2	0.375	ug/l	3.44	2,124.61	5.406E-03	Pulse	0.30	3
Fe			2	90509.896	ug/l	1.20	615,102,944.45	1.565E+03	Analog	0.30	3
Co			2	0.174	ug/l	5.64	2,500.91	6.365E-03	Pulse	0.30	3
Ni			2	0.788	ug/l	3.88	3,004.76	7.648E-03	Pulse	0.30	3
Cu			2	-0.090	ug/l	-22.96	4,885.23	1.243E-02	Pulse	0.30	3
Zn			2	0.419	ug/l	3.12	980.04	2.494E-03	Pulse	0.30	3
As			2	0.055	ug/l	22.41	76.00	1.934E-04	Pulse	1.00	3
Cd			2	-0.192	ug/l	-8.40	-391.88	-1.890E-04	Pulse	0.30	3
Sn			2	2091.548	ug/l	0.77	8,844,731.87	4.263E+00	Analog	0.30	3
Se			3	0.122	ug/l	20.91	52.27	9.259E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,827,486.08	1.12	93.0	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		6,042,265.12	1.36	97.2	Analog	0.10	3
1	Ge		1,104,286.94	1.85	91.2	Pulse	0.10	3
1	Ge		1,537,635.97	1.40	91.0	Pulse	0.10	3
1	Rh		7,994,966.55	0.73	85.9	Analog	0.10	3
1	In		8,184,471.43	0.32	85.4	Analog	0.10	3
1	Tb		13,439,238.13	0.53	92.6	Analog	0.10	3
1	Ho		13,643,677.30	0.62	92.2	Analog	0.10	3
1	Bi		7,621,284.47	1.04	81.8	Analog	0.10	3
2	Sc		392,961.86	0.79	100.3	Pulse	0.30	3
2	Ge		228,383.58	0.81	94.8	Pulse	0.30	3
2	Ge		341,885.76	0.54	94.1	Pulse	0.30	3
2	Rh		5,690,277.55	0.53	84.6	Analog	0.30	3
2	In		2,074,653.10	1.11	86.6	Pulse	0.30	3
2	Tb		8,489,795.77	0.78	92.6	Analog	0.30	3
2	Ho		8,771,376.32	0.41	93.0	Analog	0.30	3
2	Bi		5,019,767.44	4.74	77.9	Mix	0.30	3
3	Sc		640,952.61	1.18	95.2	Pulse	0.30	3
3	Ge		378,147.78	1.14	91.0	Pulse	0.30	3
3	Ge		564,758.88	0.65	89.7	Pulse	0.30	3
3	Rh		5,269,424.37	1.44	79.7	Mix	0.30	3
3	Tb		9,949,212.10	0.07	87.6	Analog	0.30	3

Quantitation Report

File Name	022ICSB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 16:17
Sample Name	ICSAB
Sample Type	ICSB
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	-0.001	ug/l	-150.79	25.33	9.550E-06	Pulse	0.25	3
B			1	53.294	ug/l	2.13	225,475.84	8.474E-02	Pulse	0.15	3
Ca			1	98148.717	ug/l	0.50	75,972,427.20	1.315E+01	Analog	0.10	3
Sr			1	1913.180	ug/l	0.32	73,682,665.57	9.667E+00	Analog	0.10	3
Mo			1	2245.848	ug/l	0.56	15,805,776.01	2.074E+00	Analog	0.10	3
Ag			1	20.575	ug/l	1.70	373,830.14	4.704E-02	Pulse	0.10	3
Sn			1	2015.363	ug/l	0.29	24,050,893.81	3.026E+00	Analog	0.10	3
Sb			1	0.524	ug/l	4.48	6,168.09	4.732E-04	Pulse	0.10	3
Ba			1	0.257	ug/l	10.54	1,710.16	1.312E-04	Pulse	0.10	3
Tl			1	0.007	ug/l	18.25	290.01	3.898E-05	Pulse	0.10	3
Pb			1	0.130	ug/l	3.38	2,070.24	2.782E-04	Pulse	0.10	3
Pb			1	0.132	ug/l	12.13	1,813.51	2.436E-04	Pulse	0.10	3
Pb			1	0.134	ug/l	2.27	8,424.61	1.132E-03	Pulse	0.10	3
Na			2	97320.522	ug/l	0.86	133,469,639.14	3.542E+02	Analog	0.30	3
Mg			2	97108.626	ug/l	1.21	63,365,173.04	1.682E+02	Analog	0.30	3
Al			2	97570.005	ug/l	1.82	22,199,714.67	5.892E+01	Analog	0.30	3
K			2	101192.206	ug/l	1.10	47,481,397.00	1.260E+02	Analog	0.30	3
Ca			2	106186.095	ug/l	0.46	2,661,605.45	7.063E+00	Pulse	0.30	3
Ti			2	1913.838	ug/l	1.25	363,767.71	9.654E-01	Pulse	0.30	3
V			2	19.727	ug/l	0.77	128,164.36	3.401E-01	Pulse	0.30	3
Cr			2	19.463	ug/l	0.96	163,156.00	4.330E-01	Pulse	0.30	3
Mn			2	19.653	ug/l	0.76	88,185.57	2.340E-01	Pulse	0.30	3
Fe			2	93304.869	ug/l	1.08	608,068,260.28	1.614E+03	Analog	0.30	3
Co			2	18.541	ug/l	0.38	249,855.00	6.631E-01	Pulse	0.30	3
Ni			2	18.083	ug/l	0.81	65,306.55	1.733E-01	Pulse	0.30	3
Cu			2	17.068	ug/l	0.52	174,556.62	4.632E-01	Pulse	0.30	3
Zn			2	16.903	ug/l	0.40	26,018.55	6.905E-02	Pulse	0.30	3
As			2	19.522	ug/l	1.63	15,228.46	4.042E-02	Pulse	1.00	3
Cd			2	18.956	ug/l	2.00	39,438.46	1.933E-02	Pulse	0.30	3
Sn			2	2018.408	ug/l	1.23	8,391,576.05	4.114E+00	Analog	0.30	3
Se			3	21.820	ug/l	0.78	4,927.34	8.903E-03	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,661,141.49	1.43	87.5	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		5,777,790.54	1.60	93.0	Analog	0.10	3
1	Ge		1,089,041.21	1.90	89.9	Pulse	0.10	3
1	Ge		1,501,159.98	1.94	88.9	Pulse	0.10	3
1	Rh		7,621,921.55	0.86	81.9	Analog	0.10	3
1	In		7,947,276.57	0.53	82.9	Analog	0.10	3
1	Tb		13,035,524.81	0.65	89.8	Analog	0.10	3
1	Ho		13,300,256.47	1.07	89.9	Analog	0.10	3
1	Bi		7,442,185.51	0.51	79.9	Analog	0.10	3
2	Sc		376,821.46	0.56	96.2	Pulse	0.30	3
2	Ge		220,683.29	0.95	91.6	Pulse	0.30	3
2	Ge		331,174.29	0.79	91.1	Pulse	0.30	3
2	Rh		5,496,616.45	0.68	81.8	Analog	0.30	3
2	In		2,039,750.29	0.94	85.1	Pulse	0.30	3
2	Tb		8,309,834.67	0.08	90.7	Analog	0.30	3
2	Ho		8,489,178.83	0.58	90.0	Analog	0.30	3
2	Bi		4,846,926.20	1.30	75.2	Pulse	0.30	3
3	Sc		625,260.27	0.78	92.9	Pulse	0.30	3
3	Ge		373,825.95	0.67	89.9	Pulse	0.30	3
3	Ge		553,486.77	0.53	87.9	Pulse	0.30	3
3	Rh		5,195,592.99	0.91	78.6	Mix	0.30	3
3	Tb		9,823,384.33	1.08	86.5	Analog	0.30	3

Quantitation Report

File Name	023SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 16:22
Sample Name	rinseconf
Sample Type	Sample
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.000	ug/l	562.46	33.33	1.255E-05	Pulse	0.25	3
B			1	0.436	ug/l	17.54	7,761.94	2.925E-03	Pulse	0.15	3
Ca			1	4.018	ug/l	14.69	10,637.10	1.932E-03	Pulse	0.10	3
Sr			1	0.070	ug/l	6.37	3,543.86	4.199E-04	Pulse	0.10	3
Mo			1	1.379	ug/l	5.76	10,834.06	1.283E-03	Pulse	0.10	3
Ag			1	0.015	ug/l	11.52	343.35	3.920E-05	Pulse	0.10	3
Sn			1	0.354	ug/l	4.60	5,657.89	6.459E-04	Pulse	0.10	3
Sb			1	0.271	ug/l	3.10	2,363.61	1.754E-04	Pulse	0.10	3
Ba			1	0.001	ug/l	384.99	63.34	4.687E-06	Pulse	0.10	3
Tl			1	0.002	ug/l	21.23	103.33	1.200E-05	Pulse	0.10	3
Pb			1	0.010	ug/l	43.15	440.02	5.108E-05	Pulse	0.10	3
Pb			1	0.017	ug/l	12.09	476.70	5.529E-05	Pulse	0.10	3
Pb			1	0.011	ug/l	26.39	1,813.45	2.104E-04	Pulse	0.10	3
Na			2	9.349	ug/l	3.65	23,042.50	6.715E-02	Pulse	0.30	3
Mg			2	3.253	ug/l	16.32	2,114.61	6.162E-03	Pulse	0.30	3
Al			2	3.173	ug/l	10.28	696.69	2.031E-03	Pulse	0.30	3
K			2	6.818	ug/l	10.15	14,088.29	4.105E-02	Pulse	0.30	3
Ca			2	4.724	ug/l	29.53	195.56	5.696E-04	Pulse	0.30	3
Ti			2	0.719	ug/l	22.16	140.00	4.081E-04	Pulse	0.30	3
V			2	0.002	ug/l	151.82	220.00	6.410E-04	Pulse	0.30	3
Cr			2	0.003	ug/l	152.92	342.23	9.971E-04	Pulse	0.30	3
Mn			2	-0.039	ug/l	-14.79	172.23	5.018E-04	Pulse	0.30	3
Fe			2	10.295	ug/l	1.88	64,902.32	1.891E-01	Pulse	0.30	3
Co			2	0.001	ug/l	96.11	53.16	1.549E-04	Pulse	0.30	3
Ni			2	0.007	ug/l	40.71	58.89	1.715E-04	Pulse	0.30	3
Cu			2	-0.302	ug/l	-4.13	2,357.97	6.870E-03	Pulse	0.30	3
Zn			2	-0.055	ug/l	-24.99	198.89	5.794E-04	Pulse	0.30	3
As			2	0.019	ug/l	58.30	40.33	1.176E-04	Pulse	1.00	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Cd			2	0.007	ug/l	56.77	30.00	1.362E-05	Pulse	0.30	3
Sn			2	0.521	ug/l	3.43	2,129.06	9.671E-04	Pulse	0.30	3
Se			3	0.039	ug/l	28.70	34.00	5.871E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,653,454.93	0.41	87.2	Pulse	0.10	3
1	Sc		5,506,466.17	1.22	88.6	Analog	0.10	3
1	Ge		1,090,706.88	1.17	90.1	Pulse	0.10	3
1	Ge		1,530,082.69	1.43	90.6	Pulse	0.10	3
1	Rh		8,444,142.17	1.27	90.7	Analog	0.10	3
1	In		8,760,401.90	0.20	91.4	Analog	0.10	3
1	Tb		13,471,697.30	0.97	92.8	Analog	0.10	3
1	Ho		13,640,917.71	0.82	92.2	Analog	0.10	3
1	Bi		8,626,318.41	1.47	92.6	Analog	0.10	3
2	Sc		343,167.33	0.49	87.6	Pulse	0.30	3
2	Ge		217,481.38	0.50	90.3	Pulse	0.30	3
2	Ge		328,290.71	0.25	90.3	Pulse	0.30	3
2	Rh		6,215,193.36	0.32	92.4	Analog	0.30	3
2	In		2,201,343.22	0.40	91.9	Pulse	0.30	3
2	Tb		8,547,629.94	0.79	93.3	Analog	0.30	3
2	Ho		8,838,530.76	0.78	93.8	Analog	0.30	3
2	Bi		5,986,436.57	0.54	92.9	Analog	0.30	3
3	Sc		607,151.59	0.44	90.2	Pulse	0.30	3
3	Ge		383,004.69	0.06	92.2	Pulse	0.30	3
3	Ge		578,918.99	0.53	91.9	Pulse	0.30	3
3	Rh		6,059,756.84	0.83	91.6	Analog	0.30	3
3	Tb		10,601,001.25	0.99	93.4	Analog	0.30	3

Quantitation Report

File Name	024_CCV.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 16:28
Sample Name	CCVA
Sample Type	CCV
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	50.444	ug/l	1.21	283,526.74	1.069E-01	Pulse	0.25	3
B			1	101.224	ug/l	1.17	421,623.24	1.589E-01	Pulse	0.15	3
Ca			1	4957.156	ug/l	0.26	3,731,673.17	6.655E-01	Pulse	0.10	3
Sr			1	50.657	ug/l	1.07	2,119,619.35	2.560E-01	Pulse	0.10	3
Mo			1	51.154	ug/l	1.82	391,109.48	4.724E-02	Pulse	0.10	3
Ag			1	50.743	ug/l	1.10	1,009,289.96	1.160E-01	Pulse	0.10	3
Sn			1	49.657	ug/l	0.89	649,767.24	7.468E-02	Pulse	0.10	3
Sb			1	50.275	ug/l	0.62	795,958.01	5.894E-02	Pulse	0.10	3
Ba			1	48.797	ug/l	1.35	326,227.56	2.416E-02	Pulse	0.10	3
Tl			1	49.479	ug/l	1.09	2,266,134.29	2.674E-01	Pulse	0.10	3
Pb			1	49.342	ug/l	1.32	789,790.48	9.321E-02	Pulse	0.10	3
Pb			1	49.334	ug/l	1.62	687,925.61	8.118E-02	Pulse	0.10	3
Pb			1	49.269	ug/l	1.44	3,146,554.72	3.713E-01	Pulse	0.10	3
Na			2	5078.825	ug/l	0.97	6,636,615.99	1.852E+01	Analog	0.30	3
Mg			2	4937.259	ug/l	0.90	3,064,635.50	8.550E+00	Pulse	0.30	3
Al			2	4769.234	ug/l	0.92	1,032,238.67	2.880E+00	Pulse	0.30	3
K			2	4945.223	ug/l	0.83	2,218,282.13	6.189E+00	Pulse	0.30	3
Ca			2	5251.515	ug/l	0.53	125,300.42	3.496E-01	Pulse	0.30	3
Ti			2	49.631	ug/l	0.91	8,989.21	2.508E-02	Pulse	0.30	3
V			2	49.785	ug/l	0.60	307,334.76	8.574E-01	Pulse	0.30	3
Cr			2	49.280	ug/l	0.58	392,459.15	1.095E+00	Pulse	0.30	3
Mn			2	49.485	ug/l	0.27	210,683.78	5.878E-01	Pulse	0.30	3
Fe			2	4971.921	ug/l	0.31	30,825,547.66	8.600E+01	Analog	0.30	3
Co			2	49.267	ug/l	0.36	631,462.51	1.762E+00	Pulse	0.30	3
Ni			2	48.937	ug/l	0.52	168,048.16	4.688E-01	Pulse	0.30	3
Cu			2	48.747	ug/l	0.33	464,379.34	1.296E+00	Pulse	0.30	3
Zn			2	48.863	ug/l	0.23	71,001.67	1.981E-01	Pulse	0.30	3
As			2	50.730	ug/l	0.22	37,599.04	1.049E-01	Pulse	1.00	3
Cd			2	49.241	ug/l	0.75	112,795.05	5.021E-02	Pulse	0.30	3
Sn			2	49.962	ug/l	0.06	228,584.39	1.018E-01	Pulse	0.30	3
Se			3	203.730	ug/l	1.11	49,006.01	8.277E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,653,098.75	0.53	87.2	Pulse	0.10	3
1	Sc		5,607,641.79	0.92	90.2	Analog	0.10	3
1	Ge		1,110,463.97	1.91	91.7	Pulse	0.10	3

Quantitation Report

1	Ge		1,552,921.90	1.83	91.9	Pulse	0.10	3
1	Rh		8,278,835.50	0.45	88.9	Analog	0.10	3
1	In		8,700,768.37	0.41	90.8	Analog	0.10	3
1	Tb		13,504,008.97	0.49	93.1	Analog	0.10	3
1	Ho		13,833,513.13	1.04	93.5	Analog	0.10	3
1	Bi		8,472,808.62	1.10	90.9	Analog	0.10	3
2	Sc		358,436.83	0.81	91.5	Pulse	0.30	3
2	Ge		224,794.32	1.07	93.3	Pulse	0.30	3
2	Ge		337,502.04	0.16	92.8	Pulse	0.30	3
2	Rh		6,078,769.48	0.58	90.4	Analog	0.30	3
2	In		2,246,516.98	0.50	93.8	Pulse	0.30	3
2	Tb		8,693,447.15	0.64	94.8	Analog	0.30	3
2	Ho		8,940,180.48	0.14	94.8	Analog	0.30	3
2	Bi		5,902,828.65	0.19	91.6	Analog	0.30	3
3	Sc		625,780.27	0.62	93.0	Pulse	0.30	3
3	Ge		392,170.43	2.25	94.4	Pulse	0.30	3
3	Ge		592,167.42	1.49	94.0	Pulse	0.30	3
3	Rh		5,964,147.82	0.55	90.2	Analog	0.30	3
3	Tb		10,711,857.36	0.44	94.3	Analog	0.30	3

Quantitation Report

File Name	025_CCB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 16:33
Sample Name	CCB
Sample Type	CCB
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.002	ug/l	171.64	45.33	1.688E-05	Pulse	0.25	3
B			1	2.049	ug/l	1.06	14,515.41	5.421E-03	Pulse	0.15	3
Ca			1	0.899	ug/l	16.09	8,475.82	1.514E-03	Pulse	0.10	3
Sr			1	0.012	ug/l	17.37	1,093.43	1.273E-04	Pulse	0.10	3
Mo			1	0.235	ug/l	19.34	1,950.20	2.269E-04	Pulse	0.10	3
Ag			1	0.014	ug/l	32.16	316.68	3.552E-05	Pulse	0.10	3
Sn			1	0.277	ug/l	6.27	4,710.92	5.296E-04	Pulse	0.10	3
Sb			1	0.600	ug/l	3.76	7,602.16	5.616E-04	Pulse	0.10	3
Ba			1	0.004	ug/l	40.12	80.00	5.910E-06	Pulse	0.10	3
Tl			1	0.010	ug/l	24.71	490.03	5.650E-05	Pulse	0.10	3
Pb			1	0.008	ug/l	37.73	423.36	4.880E-05	Pulse	0.10	3
Pb			1	0.018	ug/l	20.30	483.36	5.579E-05	Pulse	0.10	3
Pb			1	0.012	ug/l	7.10	1,873.46	2.161E-04	Pulse	0.10	3
Na			2	5.092	ug/l	53.81	18,331.36	5.166E-02	Pulse	0.30	3
Mg			2	0.844	ug/l	15.55	706.69	1.990E-03	Pulse	0.30	3
Al			2	0.800	ug/l	4.28	212.23	5.974E-04	Pulse	0.30	3
K			2	1.808	ug/l	14.92	12,365.81	3.481E-02	Pulse	0.30	3
Ca			2	1.002	ug/l	44.78	114.45	3.220E-04	Pulse	0.30	3
Ti			2	0.115	ug/l	14.55	36.67	1.032E-04	Pulse	0.30	3
V			2	0.000	ug/l	723.15	217.78	6.134E-04	Pulse	0.30	3
Cr			2	0.010	ug/l	32.30	406.68	1.145E-03	Pulse	0.30	3
Mn			2	-0.038	ug/l	-14.58	181.11	5.102E-04	Pulse	0.30	3
Fe			2	2.571	ug/l	4.76	19,727.47	5.553E-02	Pulse	0.30	3
Co			2	0.002	ug/l	25.30	75.50	2.127E-04	Pulse	0.30	3
Ni			2	0.008	ug/l	62.92	65.56	1.843E-04	Pulse	0.30	3
Cu			2	-0.275	ug/l	-0.78	2,696.92	7.592E-03	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	-0.014	ug/l	-109.91	265.56	7.474E-04	Pulse	0.30	3
As			2	0.017	ug/l	23.99	40.67	1.145E-04	Pulse	1.00	3
Cd			2	0.009	ug/l	26.37	35.32	1.589E-05	Pulse	0.30	3
Sn			2	0.509	ug/l	3.58	2,095.72	9.425E-04	Pulse	0.30	3
Se			3	0.125	ug/l	6.20	55.53	9.376E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,677,442.60	1.10	88.0	Pulse	0.10	3
1	Sc		5,596,208.67	1.14	90.0	Analog	0.10	3
1	Ge		1,106,859.25	1.34	91.4	Pulse	0.10	3
1	Ge		1,551,520.76	1.01	91.9	Pulse	0.10	3
1	Rh		8,592,762.37	0.34	92.3	Analog	0.10	3
1	In		8,891,151.11	1.48	92.8	Analog	0.10	3
1	Tb		13,535,563.13	1.23	93.3	Analog	0.10	3
1	Ho		13,799,347.71	1.20	93.2	Analog	0.10	3
1	Bi		8,670,832.79	1.07	93.1	Analog	0.10	3
2	Sc		355,210.23	0.96	90.7	Pulse	0.30	3
2	Ge		223,131.40	0.75	92.6	Pulse	0.30	3
2	Ge		337,209.86	0.66	92.8	Pulse	0.30	3
2	Rh		6,251,637.25	1.50	93.0	Analog	0.30	3
2	In		2,223,737.60	0.54	92.8	Pulse	0.30	3
2	Tb		8,630,931.88	0.92	94.2	Analog	0.30	3
2	Ho		8,882,211.59	0.73	94.2	Analog	0.30	3
2	Bi		6,080,794.76	0.83	94.4	Analog	0.30	3
3	Sc		626,260.30	0.91	93.0	Pulse	0.30	3
3	Ge		393,409.05	0.58	94.7	Pulse	0.30	3
3	Ge		592,227.86	0.51	94.1	Pulse	0.30	3
3	Rh		6,157,047.12	0.48	93.1	Analog	0.30	3
3	Tb		10,681,653.74	0.64	94.1	Analog	0.30	3

Quantitation Report

File Name	026SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 16:38
Sample Name	MP19163-MB1 5
Sample Type	Sample
Comment	
Prep Dilution	2.000
Auto Dilution	N/A
Total Dilution	2.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.013	ug/l	15.33	62.67	2.555E-05	Pulse	0.25	3
B			1	3.380	ug/l	7.30	11,940.02	4.866E-03	Pulse	0.15	3
Ca			1	42.795	ug/l	4.02	22,395.76	4.261E-03	Pulse	0.10	3
Sr			1	0.104	ug/l	4.78	2,656.99	3.285E-04	Pulse	0.10	3
Mo			1	0.424	ug/l	6.74	1,660.16	2.052E-04	Pulse	0.10	3
Ag			1	0.035	ug/l	19.50	370.02	4.375E-05	Pulse	0.10	3
Sn			1	1.473	ug/l	0.56	10,313.70	1.220E-03	Pulse	0.10	3
Sb			1	1.992	ug/l	2.85	13,526.27	1.028E-03	Pulse	0.10	3
Ba			1	0.102	ug/l	26.41	386.68	2.934E-05	Pulse	0.10	3
Tl			1	0.019	ug/l	7.23	443.35	5.258E-05	Pulse	0.10	3
Pb			1	0.077	ug/l	38.59	890.07	1.056E-04	Pulse	0.10	3
Pb			1	0.056	ug/l	16.26	616.70	7.313E-05	Pulse	0.10	3
Pb			1	0.069	ug/l	6.74	3,233.61	3.835E-04	Pulse	0.10	3
Na			2	82.227	ug/l	0.42	60,628.83	1.828E-01	Pulse	0.30	3
Mg			2	6.276	ug/l	4.18	1,977.92	5.962E-03	Pulse	0.30	3
Al			2	10.170	ug/l	3.96	1,056.72	3.185E-03	Pulse	0.30	3
K			2	8.088	ug/l	12.24	12,472.55	3.760E-02	Pulse	0.30	3
Ca			2	39.536	ug/l	14.29	521.13	1.570E-03	Pulse	0.30	3
Ti			2	1.041	ug/l	28.50	102.22	3.079E-04	Pulse	0.30	3
V			2	0.213	ug/l	6.30	808.92	2.438E-03	Pulse	0.30	3
Cr			2	0.509	ug/l	8.02	2,179.08	6.567E-03	Pulse	0.30	3
Mn			2	0.146	ug/l	14.86	606.68	1.829E-03	Pulse	0.30	3
Fe			2	11.506	ug/l	2.80	36,681.90	1.106E-01	Pulse	0.30	3
Co			2	0.006	ug/l	41.83	77.68	2.340E-04	Pulse	0.30	3
Ni			2	0.233	ug/l	6.53	404.46	1.219E-03	Pulse	0.30	3
Cu			2	2.833	ug/l	1.07	17,260.29	5.203E-02	Pulse	0.30	3
Zn			2	2.627	ug/l	4.82	2,025.71	6.106E-03	Pulse	0.30	3
As			2	0.264	ug/l	8.10	116.67	3.516E-04	Pulse	1.00	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Cd			2	0.013	ug/l	27.84	28.71	1.376E-05	Pulse	0.30	3
Sn			2	1.963	ug/l	0.26	3,977.22	1.906E-03	Pulse	0.30	3
Se			3	0.192	ug/l	11.30	47.53	8.190E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,454,207.12	0.99	80.7	Pulse	0.10	3
1	Sc		5,256,436.59	0.29	84.6	Analog	0.10	3
1	Ge		1,052,213.13	1.30	86.9	Pulse	0.10	3
1	Ge		1,471,158.99	0.84	87.1	Pulse	0.10	3
1	Rh		8,088,156.13	0.41	86.9	Analog	0.10	3
1	In		8,457,236.40	0.97	88.3	Analog	0.10	3
1	Tb		13,161,186.05	1.05	90.7	Analog	0.10	3
1	Ho		13,407,997.30	0.33	90.6	Analog	0.10	3
1	Bi		8,432,366.96	0.03	90.5	Analog	0.10	3
2	Sc		331,756.44	0.47	84.7	Pulse	0.30	3
2	Ge		212,814.77	0.51	88.3	Pulse	0.30	3
2	Ge		320,772.85	0.21	88.2	Pulse	0.30	3
2	Rh		5,976,660.87	0.70	88.9	Analog	0.30	3
2	In		2,086,777.27	0.51	87.1	Pulse	0.30	3
2	Tb		8,389,358.56	0.29	91.5	Analog	0.30	3
2	Ho		8,627,580.77	1.05	91.5	Analog	0.30	3
2	Bi		5,840,295.05	0.58	90.7	Analog	0.30	3
3	Sc		614,686.07	0.59	91.3	Pulse	0.30	3
3	Ge		385,141.92	0.36	92.7	Pulse	0.30	3
3	Ge		580,322.74	1.14	92.2	Pulse	0.30	3
3	Rh		6,135,807.12	0.94	92.8	Analog	0.30	3
3	Tb		10,822,253.46	0.59	95.3	Analog	0.30	3

Quantitation Report

File Name	027SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 16:42
Sample Name	MP19163-B2
Sample Type	Sample
Comment	
Prep Dilution	2.000
Auto Dilution	N/A
Total Dilution	2.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	73.447	ug/l	1.01	192,194.11	7.780E-02	Pulse	0.25	3
B			1	83.550	ug/l	2.56	165,274.88	6.691E-02	Pulse	0.15	3
Ca			1	3968.445	ug/l	0.36	1,411,399.09	2.672E-01	Pulse	0.10	3
Sr			1	73.672	ug/l	1.59	1,495,475.24	1.862E-01	Pulse	0.10	3
Mo			1	80.157	ug/l	1.74	297,293.92	3.702E-02	Pulse	0.10	3
Ag			1	78.455	ug/l	1.59	754,558.06	8.968E-02	Pulse	0.10	3
Sn			1	77.467	ug/l	1.38	490,339.99	5.828E-02	Pulse	0.10	3
Sb			1	77.429	ug/l	2.13	604,173.80	4.536E-02	Pulse	0.10	3
Ba			1	70.917	ug/l	2.40	233,849.11	1.756E-02	Pulse	0.10	3
Tl			1	72.570	ug/l	1.91	1,636,007.68	1.961E-01	Pulse	0.10	3
Pb			1	80.362	ug/l	1.63	633,209.45	7.591E-02	Pulse	0.10	3
Pb			1	79.808	ug/l	1.62	547,808.44	6.567E-02	Pulse	0.10	3
Pb			1	79.728	ug/l	1.93	2,506,527.27	3.005E-01	Pulse	0.10	3
Na			2	3970.504	ug/l	0.38	2,462,435.80	7.258E+00	Pulse	0.30	3
Mg			2	3934.202	ug/l	0.49	1,155,881.38	3.407E+00	Pulse	0.30	3
Al			2	3742.995	ug/l	0.85	383,444.89	1.130E+00	Pulse	0.30	3
K			2	3912.072	ug/l	0.28	837,213.82	2.468E+00	Pulse	0.30	3
Ca			2	4312.548	ug/l	1.43	48,745.62	1.437E-01	Pulse	0.30	3
Ti			2	76.348	ug/l	2.77	6,548.02	1.930E-02	Pulse	0.30	3
V			2	74.744	ug/l	0.76	218,422.56	6.438E-01	Pulse	0.30	3
Cr			2	74.525	ug/l	1.11	280,951.89	8.281E-01	Pulse	0.30	3
Mn			2	74.573	ug/l	0.72	150,339.97	4.431E-01	Pulse	0.30	3
Fe			2	4054.879	ug/l	0.51	11,900,365.08	3.508E+01	Analog	0.30	3
Co			2	74.266	ug/l	0.27	450,489.76	1.328E+00	Pulse	0.30	3
Ni			2	73.536	ug/l	0.79	119,519.74	3.523E-01	Pulse	0.30	3
Cu			2	75.631	ug/l	0.82	342,100.78	1.008E+00	Pulse	0.30	3
Zn			2	68.626	ug/l	0.75	47,273.58	1.393E-01	Pulse	0.30	3
As			2	73.176	ug/l	0.40	25,674.44	7.568E-02	Pulse	1.00	3
Cd			2	71.905	ug/l	0.30	78,104.36	3.666E-02	Pulse	0.30	3
Sn			2	79.028	ug/l	1.15	171,401.82	8.045E-02	Pulse	0.30	3
Se			3	363.182	ug/l	2.11	43,423.75	7.378E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,470,456.73	0.81	81.2	Pulse	0.10	3
1	Sc		5,282,177.84	0.73	85.0	Analog	0.10	3
1	Ge		1,055,306.29	0.22	87.2	Pulse	0.10	3

Quantitation Report

1	Ge		1,481,487.01	1.22	87.7	Pulse	0.10	3
1	Rh		8,031,484.25	0.97	86.3	Analog	0.10	3
1	In		8,414,108.75	1.10	87.8	Analog	0.10	3
1	Tb		13,322,101.05	0.76	91.8	Analog	0.10	3
1	Ho		13,551,904.38	0.44	91.6	Analog	0.10	3
1	Bi		8,341,868.21	0.48	89.5	Analog	0.10	3
2	Sc		339,270.15	0.47	86.6	Pulse	0.30	3
2	Ge		214,812.36	0.26	89.2	Pulse	0.30	3
2	Ge		325,291.01	0.82	89.5	Pulse	0.30	3
2	Rh		5,955,556.57	0.25	88.6	Analog	0.30	3
2	In		2,130,451.04	0.54	88.9	Pulse	0.30	3
2	Tb		8,363,609.95	0.17	91.2	Analog	0.30	3
2	Ho		8,713,082.71	0.79	92.4	Analog	0.30	3
2	Bi		5,775,555.05	0.46	89.7	Analog	0.30	3
3	Sc		621,839.64	1.65	92.4	Pulse	0.30	3
3	Ge		387,685.17	2.38	93.3	Pulse	0.30	3
3	Ge		588,753.99	2.06	93.5	Pulse	0.30	3
3	Rh		6,062,741.84	1.82	91.7	Analog	0.30	3
3	Tb		10,833,595.12	0.74	95.4	Analog	0.30	3

Quantitation Report

File Name	028SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 16:47
Sample Name	MP19163-S3
Sample Type	Sample
Comment	
Prep Dilution	2.000
Auto Dilution	N/A
Total Dilution	2.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	74.551	ug/l	1.13	192,567.26	7.897E-02	Pulse	0.25	3
B			1	107.662	ug/l	0.59	208,648.74	8.557E-02	Pulse	0.15	3
Ca			1	9663.685	ug/l	1.55	3,428,886.61	6.487E-01	Pulse	0.10	3
Sr			1	105.709	ug/l	2.78	2,117,505.02	2.671E-01	Pulse	0.10	3
Mo			1	83.452	ug/l	2.68	305,472.87	3.854E-02	Pulse	0.10	3
Ag			1	78.873	ug/l	1.11	762,873.43	9.015E-02	Pulse	0.10	3
Sn			1	79.769	ug/l	0.42	507,736.50	6.000E-02	Pulse	0.10	3
Sb			1	79.091	ug/l	1.37	620,315.68	4.633E-02	Pulse	0.10	3
Ba			1	86.455	ug/l	0.85	286,521.34	2.140E-02	Pulse	0.10	3
Tl			1	73.385	ug/l	1.47	1,663,002.89	1.983E-01	Pulse	0.10	3
Pb			1	81.894	ug/l	2.51	648,627.02	7.735E-02	Pulse	0.10	3
Pb			1	81.536	ug/l	2.45	562,581.83	6.709E-02	Pulse	0.10	3
Pb			1	81.832	ug/l	2.31	2,586,015.92	3.084E-01	Pulse	0.10	3
Na			2	7142.069	ug/l	1.49	4,470,063.71	1.303E+01	Mix	0.30	3
Mg			2	4815.654	ug/l	0.53	1,430,724.77	4.170E+00	Pulse	0.30	3
Al			2	3772.486	ug/l	0.70	390,808.69	1.139E+00	Pulse	0.30	3
K			2	5313.703	ug/l	0.58	1,145,945.89	3.340E+00	Pulse	0.30	3
Ca			2	10109.898	ug/l	1.06	115,443.89	3.365E-01	Pulse	0.30	3
Ti			2	77.051	ug/l	0.59	6,682.54	1.948E-02	Pulse	0.30	3
V			2	77.078	ug/l	1.01	227,770.78	6.639E-01	Pulse	0.30	3
Cr			2	76.906	ug/l	1.16	293,183.73	8.546E-01	Pulse	0.30	3
Mn			2	77.109	ug/l	0.75	157,190.44	4.582E-01	Pulse	0.30	3
Fe			2	4142.775	ug/l	0.49	12,294,790.90	3.584E+01	Analog	0.30	3
Co			2	75.562	ug/l	0.61	463,501.64	1.351E+00	Pulse	0.30	3
Ni			2	75.778	ug/l	0.49	124,547.85	3.630E-01	Pulse	0.30	3
Cu			2	77.324	ug/l	0.78	353,584.30	1.031E+00	Pulse	0.30	3
Zn			2	68.257	ug/l	1.80	47,549.81	1.386E-01	Pulse	0.30	3
As			2	74.524	ug/l	1.99	26,441.68	7.707E-02	Pulse	1.00	3
Cd			2	71.822	ug/l	0.98	79,477.66	3.662E-02	Pulse	0.30	3
Sn			2	80.552	ug/l	0.38	177,985.89	8.201E-02	Pulse	0.30	3
Se			3	357.409	ug/l	0.40	44,142.25	7.260E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,438,444.88	0.59	80.2	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		5,285,986.80	0.86	85.0	Analog	0.10	3
1	Ge		1,084,057.15	1.83	89.5	Pulse	0.10	3
1	Ge		1,512,591.28	1.88	89.5	Pulse	0.10	3
1	Rh		7,928,531.76	1.24	85.2	Analog	0.10	3
1	In		8,461,788.69	0.65	88.3	Analog	0.10	3
1	Tb		13,388,311.05	0.88	92.3	Analog	0.10	3
1	Ho		13,569,381.47	0.57	91.7	Analog	0.10	3
1	Bi		8,385,143.83	0.33	90.0	Analog	0.10	3
2	Sc		343,082.36	0.19	87.6	Pulse	0.30	3
2	Ge		220,216.64	0.74	91.4	Pulse	0.30	3
2	Ge		333,143.30	0.49	91.6	Pulse	0.30	3
2	Rh		5,996,071.43	0.64	89.2	Analog	0.30	3
2	In		2,170,411.95	0.98	90.6	Pulse	0.30	3
2	Tb		8,452,733.00	0.44	92.2	Analog	0.30	3
2	Ho		8,744,681.04	1.24	92.8	Analog	0.30	3
2	Bi		5,755,327.69	0.22	89.3	Analog	0.30	3
3	Sc		644,665.84	0.88	95.8	Pulse	0.30	3
3	Ge		402,502.46	0.57	96.8	Pulse	0.30	3
3	Ge		607,992.08	0.74	96.6	Pulse	0.30	3
3	Rh		6,164,728.64	0.30	93.2	Analog	0.30	3
3	Tb		11,105,565.67	0.45	97.8	Analog	0.30	3

Quantitation Report

File Name	029SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 16:52
Sample Name	MP19163-S4
Sample Type	Sample
Comment	
Prep Dilution	2.000
Auto Dilution	N/A
Total Dilution	2.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	74.124	ug/l	1.36	189,275.05	7.852E-02	Pulse	0.25	3
B			1	107.823	ug/l	1.72	206,575.44	8.569E-02	Pulse	0.15	3
Ca			1	9921.321	ug/l	0.84	3,545,273.18	6.659E-01	Pulse	0.10	3
Sr			1	107.024	ug/l	1.51	2,165,955.07	2.705E-01	Pulse	0.10	3
Mo			1	85.028	ug/l	1.38	314,452.44	3.926E-02	Pulse	0.10	3
Ag			1	78.762	ug/l	2.41	766,335.69	9.003E-02	Pulse	0.10	3
Sn			1	82.260	ug/l	2.84	526,682.97	6.187E-02	Pulse	0.10	3
Sb			1	79.582	ug/l	2.58	626,953.01	4.662E-02	Pulse	0.10	3
Ba			1	85.538	ug/l	1.14	284,754.29	2.117E-02	Pulse	0.10	3
Tl			1	73.235	ug/l	1.55	1,664,530.18	1.979E-01	Pulse	0.10	3
Pb			1	81.068	ug/l	2.62	643,993.64	7.657E-02	Pulse	0.10	3
Pb			1	81.085	ug/l	2.17	561,108.96	6.672E-02	Pulse	0.10	3
Pb			1	81.112	ug/l	2.28	2,570,860.19	3.057E-01	Pulse	0.10	3
Na			2	7298.250	ug/l	0.98	4,674,698.15	1.331E+01	Analog	0.30	3
Mg			2	4800.376	ug/l	0.83	1,459,605.64	4.157E+00	Pulse	0.30	3
Al			2	3708.459	ug/l	0.87	393,184.85	1.120E+00	Pulse	0.30	3
K			2	5321.451	ug/l	0.69	1,174,519.68	3.345E+00	Pulse	0.30	3
Ca			2	10285.203	ug/l	0.38	120,202.90	3.423E-01	Pulse	0.30	3
Ti			2	78.265	ug/l	0.52	6,947.08	1.978E-02	Pulse	0.30	3
V			2	75.464	ug/l	0.94	228,232.29	6.500E-01	Pulse	0.30	3
Cr			2	75.483	ug/l	0.48	294,515.28	8.388E-01	Pulse	0.30	3
Mn			2	76.266	ug/l	0.93	159,118.13	4.532E-01	Pulse	0.30	3
Fe			2	4060.303	ug/l	1.45	12,332,234.79	3.512E+01	Analog	0.30	3
Co			2	73.712	ug/l	0.70	462,766.72	1.318E+00	Pulse	0.30	3
Ni			2	73.946	ug/l	1.58	124,386.02	3.542E-01	Pulse	0.30	3
Cu			2	75.380	ug/l	1.28	352,901.82	1.005E+00	Pulse	0.30	3
Zn			2	68.336	ug/l	0.25	48,722.22	1.388E-01	Pulse	0.30	3
As			2	73.451	ug/l	0.66	26,672.37	7.596E-02	Pulse	1.00	3
Cd			2	71.810	ug/l	1.07	79,693.52	3.661E-02	Pulse	0.30	3
Sn			2	83.739	ug/l	0.67	185,585.30	8.525E-02	Pulse	0.30	3
Se			3	350.863	ug/l	1.55	44,130.22	7.128E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,410,765.55	0.96	79.3	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		5,323,966.80	1.01	85.7	Analog	0.10	3
1	Ge		1,092,174.54	1.35	90.2	Pulse	0.10	3
1	Ge		1,530,895.70	1.57	90.6	Pulse	0.10	3
1	Rh		8,008,672.80	0.30	86.0	Analog	0.10	3
1	In		8,513,191.30	0.68	88.8	Analog	0.10	3
1	Tb		13,448,402.72	0.59	92.7	Analog	0.10	3
1	Ho		13,742,201.88	0.68	92.9	Analog	0.10	3
1	Bi		8,409,899.88	0.46	90.3	Analog	0.10	3
2	Sc		351,137.08	0.70	89.6	Pulse	0.30	3
2	Ge		224,438.81	1.06	93.2	Pulse	0.30	3
2	Ge		341,331.03	1.02	93.9	Pulse	0.30	3
2	Rh		6,099,174.76	0.52	90.7	Analog	0.30	3
2	In		2,176,812.11	0.62	90.9	Pulse	0.30	3
2	Tb		8,656,968.27	0.70	94.4	Analog	0.30	3
2	Ho		8,903,502.70	0.81	94.4	Analog	0.30	3
2	Bi		5,845,188.80	0.58	90.7	Analog	0.30	3
3	Sc		652,793.50	0.78	97.0	Pulse	0.30	3
3	Ge		411,443.43	1.36	99.0	Pulse	0.30	3
3	Ge		619,230.15	1.29	98.3	Pulse	0.30	3
3	Rh		6,213,029.75	0.58	93.9	Analog	0.30	3
3	Tb		11,089,024.84	0.91	97.7	Analog	0.30	3

Quantitation Report

File Name	030SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 16:57
Sample Name	JD1056-1F
Sample Type	Sample
Comment	
Prep Dilution	2.000
Auto Dilution	N/A
Total Dilution	2.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.016	ug/l	36.35	68.00	2.836E-05	Pulse	0.25	3
B			1	25.726	ug/l	0.60	53,219.07	2.216E-02	Pulse	0.15	3
Ca			1	6098.118	ug/l	0.77	2,230,170.07	4.099E-01	Pulse	0.10	3
Sr			1	791.134	ug/l	0.93	16,305,185.59	1.999E+00	Analog	0.10	3
Mo			1	2.463	ug/l	3.32	9,356.43	1.146E-03	Pulse	0.10	3
Ag			1	0.037	ug/l	7.15	400.02	4.584E-05	Pulse	0.10	3
Sn			1	1.221	ug/l	1.41	8,992.88	1.030E-03	Pulse	0.10	3
Sb			1	1.452	ug/l	2.49	9,713.34	7.101E-04	Pulse	0.10	3
Ba			1	14.659	ug/l	1.91	49,691.12	3.632E-03	Pulse	0.10	3
Tl			1	0.026	ug/l	29.59	603.37	7.012E-05	Pulse	0.10	3
Pb			1	0.452	ug/l	4.43	3,964.04	4.599E-04	Pulse	0.10	3
Pb			1	0.424	ug/l	5.85	3,237.15	3.755E-04	Pulse	0.10	3
Pb			1	0.429	ug/l	3.21	14,986.88	1.738E-03	Pulse	0.10	3
Na			2	3367.396	ug/l	0.39	2,171,645.05	6.161E+00	Pulse	0.30	3
Mg			2	869.906	ug/l	0.36	265,700.15	7.537E-01	Pulse	0.30	3
Al			2	5.008	ug/l	17.66	573.35	1.627E-03	Pulse	0.30	3
K			2	1429.019	ug/l	0.30	325,038.11	9.221E-01	Pulse	0.30	3
Ca			2	9028.332	ug/l	0.34	105,936.06	3.005E-01	Pulse	0.30	3
Ti			2	1.195	ug/l	31.24	122.22	3.466E-04	Pulse	0.30	3
V			2	1.115	ug/l	2.16	3,597.10	1.020E-02	Pulse	0.30	3
Cr			2	1.084	ug/l	3.50	4,567.36	1.296E-02	Pulse	0.30	3
Mn			2	2.444	ug/l	1.78	5,447.63	1.545E-02	Pulse	0.30	3
Fe			2	46.054	ug/l	1.09	144,291.04	4.093E-01	Pulse	0.30	3
Co			2	0.028	ug/l	49.88	221.84	6.291E-04	Pulse	0.30	3
Ni			2	0.668	ug/l	5.79	1,164.50	3.304E-03	Pulse	0.30	3
Cu			2	2.984	ug/l	3.38	19,035.62	5.400E-02	Pulse	0.30	3
Zn			2	1.300	ug/l	1.25	1,207.84	3.426E-03	Pulse	0.30	3
As			2	1.313	ug/l	3.64	506.01	1.435E-03	Pulse	1.00	3
Cd			2	0.031	ug/l	44.76	49.25	2.257E-05	Pulse	0.30	3
Sn			2	1.564	ug/l	0.88	3,274.83	1.500E-03	Pulse	0.30	3
Se			3	0.294	ug/l	8.33	64.67	1.026E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,401,630.56	1.28	79.0	Pulse	0.10	3
1	Sc		5,441,279.08	1.03	87.5	Analog	0.10	3
1	Ge		1,105,733.47	0.89	91.3	Pulse	0.10	3

Quantitation Report

1	Ge		1,532,696.95	1.72	90.7	Pulse	0.10	3
1	Rh		8,158,329.88	1.89	87.6	Analog	0.10	3
1	In		8,727,313.24	1.26	91.1	Analog	0.10	3
1	Tb		13,680,550.21	0.82	94.3	Analog	0.10	3
1	Ho		13,923,559.79	1.26	94.1	Analog	0.10	3
1	Bi		8,621,207.16	1.06	92.5	Analog	0.10	3
2	Sc		352,507.23	0.23	90.0	Pulse	0.30	3
2	Ge		225,483.45	1.54	93.6	Pulse	0.30	3
2	Ge		340,684.53	0.82	93.7	Pulse	0.30	3
2	Rh		6,214,213.64	0.32	92.4	Analog	0.30	3
2	In		2,183,063.51	0.66	91.1	Pulse	0.30	3
2	Tb		8,571,819.94	0.66	93.5	Analog	0.30	3
2	Ho		8,939,492.70	0.49	94.8	Analog	0.30	3
2	Bi		5,935,640.32	0.24	92.1	Analog	0.30	3
3	Sc		658,909.96	1.61	97.9	Pulse	0.30	3
3	Ge		417,986.53	0.37	100.6	Pulse	0.30	3
3	Ge		629,779.14	1.03	100.0	Pulse	0.30	3
3	Rh		6,372,982.11	1.09	96.4	Analog	0.30	3
3	Tb		11,230,975.67	0.73	98.9	Analog	0.30	3

Quantitation Report

File Name	031SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 17:02
Sample Name	MP19163-SD1
Sample Type	Sample
Comment	
Prep Dilution	10.000
Auto Dilution	N/A
Total Dilution	10.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.029	ug/l	46.84	48.00	1.790E-05	Pulse	0.25	3
B			1	26.085	ug/l	5.41	16,855.31	6.287E-03	Pulse	0.15	3
Ca			1	5936.893	ug/l	0.92	480,472.04	8.093E-02	Pulse	0.10	3
Sr			1	31.084	ug/l	2.00	140,127.93	1.577E-02	Pulse	0.10	3
Mo			1	2.429	ug/l	6.48	2,076.88	2.338E-04	Pulse	0.10	3
Ag			1	0.075	ug/l	16.40	196.68	2.095E-05	Pulse	0.10	3
Sn			1	0.867	ug/l	5.44	2,293.59	2.441E-04	Pulse	0.10	3
Sb			1	3.511	ug/l	4.47	3,867.28	2.695E-04	Pulse	0.10	3
Ba			1	15.373	ug/l	4.17	10,977.61	7.650E-04	Pulse	0.10	3
Tl			1	0.075	ug/l	14.55	373.36	4.054E-05	Pulse	0.10	3
Pb			1	0.483	ug/l	11.71	1,143.43	1.242E-04	Pulse	0.10	3
Pb			1	0.499	ug/l	5.42	1,003.41	1.090E-04	Pulse	0.10	3
Pb			1	0.481	ug/l	4.35	4,483.80	4.869E-04	Pulse	0.10	3
Na			2	3404.747	ug/l	0.26	478,769.93	1.272E+00	Pulse	0.30	3
Mg			2	883.894	ug/l	0.25	57,801.48	1.536E-01	Pulse	0.30	3
Al			2	32.970	ug/l	22.16	792.26	2.105E-03	Pulse	0.30	3
K			2	1443.252	ug/l	0.55	79,871.51	2.122E-01	Pulse	0.30	3
Ca			2	6224.997	ug/l	1.11	15,678.64	4.166E-02	Pulse	0.30	3
Ti			2	5.949	ug/l	91.91	130.02	3.453E-04	Pulse	0.30	3
V			2	1.251	ug/l	3.27	1,038.93	2.761E-03	Pulse	0.30	3
Cr			2	6.451	ug/l	1.73	5,736.62	1.524E-02	Pulse	0.30	3
Mn			2	2.314	ug/l	6.60	1,395.63	3.709E-03	Pulse	0.30	3
Fe			2	53.013	ug/l	3.88	38,670.59	1.028E-01	Pulse	0.30	3
Co			2	0.071	ug/l	10.62	144.35	3.836E-04	Pulse	0.30	3
Ni			2	1.096	ug/l	6.02	434.46	1.154E-03	Pulse	0.30	3
Cu			2	1.098	ug/l	25.74	6,656.97	1.769E-02	Pulse	0.30	3
Zn			2	8.280	ug/l	6.18	1,560.10	4.146E-03	Pulse	0.30	3
As			2	1.105	ug/l	11.75	115.67	3.074E-04	Pulse	1.00	3
Cd			2	0.058	ug/l	25.66	29.82	1.284E-05	Pulse	0.30	3
Sn			2	2.316	ug/l	5.48	877.81	3.777E-04	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Se			3	0.560	ug/l	16.99	41.47	6.561E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,680,950.65	0.45	88.1	Pulse	0.10	3
1	Sc		5,937,477.00	0.98	95.5	Analog	0.10	3
1	Ge		1,170,223.16	0.84	96.7	Pulse	0.10	3
1	Ge		1,632,328.36	0.66	96.6	Pulse	0.10	3
1	Rh		8,884,089.03	0.33	95.4	Analog	0.10	3
1	In		9,394,170.46	1.24	98.0	Analog	0.10	3
1	Tb		14,350,305.62	0.37	98.9	Analog	0.10	3
1	Ho		14,614,548.11	0.33	98.7	Analog	0.10	3
1	Bi		9,209,052.57	0.34	98.8	Analog	0.10	3
2	Sc		376,329.41	0.10	96.1	Pulse	0.30	3
2	Ge		236,001.02	0.38	98.0	Pulse	0.30	3
2	Ge		354,562.81	0.88	97.5	Pulse	0.30	3
2	Rh		6,652,475.57	0.39	99.0	Analog	0.30	3
2	In		2,324,084.44	0.66	97.0	Pulse	0.30	3
2	Tb		8,988,313.25	0.87	98.1	Analog	0.30	3
2	Ho		9,272,496.58	0.60	98.4	Analog	0.30	3
2	Bi		6,292,420.30	0.40	97.7	Analog	0.30	3
3	Sc		668,731.57	1.46	99.3	Pulse	0.30	3
3	Ge		418,995.18	0.49	100.8	Pulse	0.30	3
3	Ge		631,827.49	1.14	100.3	Pulse	0.30	3
3	Rh		6,535,164.60	1.85	98.8	Analog	0.30	3
3	Tb		11,256,197.61	1.12	99.1	Analog	0.30	3

Quantitation Report

File Name	032SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 17:07
Sample Name	MP19163-PS1
Sample Type	Sample
Comment	
Prep Dilution	2.000
Auto Dilution	N/A
Total Dilution	2.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	79.301	ug/l	1.56	206,720.43	8.400E-02	Pulse	0.25	3
B			1	109.841	ug/l	2.49	214,686.39	8.725E-02	Pulse	0.15	3
Ca			1	9558.463	ug/l	1.30	3,567,944.43	6.416E-01	Pulse	0.10	3
Sr			1	107.742	ug/l	0.68	2,252,673.61	2.723E-01	Pulse	0.10	3
Mo			1	86.164	ug/l	0.57	329,190.11	3.979E-02	Pulse	0.10	3
Ag			1	77.148	ug/l	2.52	770,058.37	8.818E-02	Pulse	0.10	3
Sn			1	82.704	ug/l	1.85	543,233.83	6.221E-02	Pulse	0.10	3
Sb			1	79.854	ug/l	2.01	645,512.78	4.678E-02	Pulse	0.10	3
Ba			1	88.890	ug/l	1.12	303,619.74	2.200E-02	Pulse	0.10	3
Tl			1	76.631	ug/l	0.28	1,793,235.91	2.071E-01	Pulse	0.10	3
Pb			1	76.297	ug/l	0.37	624,076.34	7.207E-02	Pulse	0.10	3
Pb			1	76.801	ug/l	0.62	547,230.21	6.320E-02	Pulse	0.10	3
Pb			1	76.514	ug/l	0.42	2,497,031.48	2.884E-01	Pulse	0.10	3
Na			2	7492.853	ug/l	2.15	4,877,751.75	1.367E+01	Analog	0.30	3
Mg			2	4953.223	ug/l	0.87	1,530,962.51	4.289E+00	Pulse	0.30	3
Al			2	3966.859	ug/l	0.76	427,523.90	1.198E+00	Pulse	0.30	3
K			2	5417.434	ug/l	0.87	1,215,236.20	3.405E+00	Pulse	0.30	3
Ca			2	9938.721	ug/l	0.90	118,072.21	3.308E-01	Pulse	0.30	3
Ti			2	79.203	ug/l	1.56	7,147.18	2.002E-02	Pulse	0.30	3
V			2	79.442	ug/l	0.62	244,229.28	6.842E-01	Pulse	0.30	3
Cr			2	79.649	ug/l	1.90	315,852.84	8.850E-01	Pulse	0.30	3
Mn			2	80.658	ug/l	1.68	171,030.66	4.792E-01	Pulse	0.30	3
Fe			2	4285.987	ug/l	0.97	13,232,669.20	3.707E+01	Analog	0.30	3
Co			2	78.508	ug/l	0.82	501,000.78	1.404E+00	Pulse	0.30	3
Ni			2	78.171	ug/l	0.92	133,669.99	3.745E-01	Pulse	0.30	3
Cu			2	81.818	ug/l	0.79	388,923.69	1.090E+00	Pulse	0.30	3
Zn			2	73.314	ug/l	1.04	53,114.62	1.488E-01	Pulse	0.30	3
As			2	77.026	ug/l	1.47	28,428.98	7.965E-02	Pulse	1.00	3
Cd			2	76.285	ug/l	1.21	85,670.49	3.889E-02	Pulse	0.30	3
Sn			2	84.209	ug/l	0.14	188,853.37	8.573E-02	Pulse	0.30	3
Se			3	382.717	ug/l	0.25	48,221.30	7.774E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,461,019.84	1.35	80.9	Pulse	0.10	3
1	Sc		5,560,733.67	0.21	89.5	Analog	0.10	3
1	Ge		1,122,212.82	1.52	92.7	Pulse	0.10	3

Quantitation Report

1	Ge		1,567,440.81	1.61	92.8	Pulse	0.10	3
1	Rh		8,273,380.50	1.63	88.9	Analog	0.10	3
1	In		8,732,808.35	0.48	91.1	Analog	0.10	3
1	Tb		13,798,946.05	0.72	95.1	Analog	0.10	3
1	Ho		14,098,343.96	0.08	95.3	Analog	0.10	3
1	Bi		8,659,068.83	1.89	92.9	Analog	0.10	3
2	Sc		356,948.39	1.21	91.1	Pulse	0.30	3
2	Ge		226,598.00	0.41	94.0	Pulse	0.30	3
2	Ge		342,002.62	0.58	94.1	Pulse	0.30	3
2	Rh		6,248,200.87	0.81	92.9	Analog	0.30	3
2	In		2,202,797.40	0.46	92.0	Pulse	0.30	3
2	Tb		8,699,296.60	0.43	94.9	Analog	0.30	3
2	Ho		8,974,449.37	0.85	95.2	Analog	0.30	3
2	Bi		5,859,012.82	0.64	91.0	Analog	0.30	3
3	Sc		658,555.48	0.26	97.8	Pulse	0.30	3
3	Ge		410,769.53	0.36	98.8	Pulse	0.30	3
3	Ge		620,274.21	0.49	98.5	Pulse	0.30	3
3	Rh		6,285,111.69	1.72	95.0	Analog	0.30	3
3	Tb		11,194,379.56	0.37	98.6	Analog	0.30	3

Quantitation Report

File Name	033SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 17:12
Sample Name	JD1056-2F
Sample Type	Sample
Comment	
Prep Dilution	20.000
Auto Dilution	N/A
Total Dilution	20.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.047	ug/l	127.97	42.67	1.672E-05	Pulse	0.25	3
B			1	144.486	ug/l	3.50	34,341.69	1.343E-02	Pulse	0.15	3
Ca			1	264611.349	ug/l	0.70	10,184,777.76	1.774E+00	Analog	0.10	3
Sr			1	1410.293	ug/l	0.35	2,839,353.60	3.564E-01	Pulse	0.10	3
Mo			1	12.736	ug/l	0.33	4,760.85	5.975E-04	Pulse	0.10	3
Ag			1	0.413	ug/l	18.19	440.02	5.104E-05	Pulse	0.10	3
Sn			1	5.325	ug/l	10.67	4,430.79	5.137E-04	Pulse	0.10	3
Sb			1	11.671	ug/l	2.63	7,482.07	5.427E-04	Pulse	0.10	3
Ba			1	1080.950	ug/l	1.64	368,881.01	2.676E-02	Pulse	0.10	3
Tl			1	0.314	ug/l	6.14	686.71	8.497E-05	Pulse	0.10	3
Pb			1	1.985	ug/l	3.53	1,780.17	2.203E-04	Pulse	0.10	3
Pb			1	1.640	ug/l	7.54	1,306.78	1.618E-04	Pulse	0.10	3
Pb			1	1.860	ug/l	2.60	6,664.19	8.248E-04	Pulse	0.10	3
Na			2	4020863.676	ug/l	0.52	269,124,878.20	7.317E+02	Analog	0.30	3
Mg			2	23934.497	ug/l	0.63	762,438.17	2.073E+00	Pulse	0.30	3
Al			2	52.628	ug/l	13.13	626.69	1.703E-03	Pulse	0.30	3
K			2	20561.036	ug/l	0.52	482,725.92	1.312E+00	Pulse	0.30	3
Ca			2	273740.724	ug/l	0.46	334,952.66	9.107E-01	Pulse	0.30	3
Ti			2	5.030	ug/l	30.83	63.33	1.721E-04	Pulse	0.30	3
V			2	2.630	ug/l	9.23	1,055.60	2.870E-03	Pulse	0.30	3
Cr			2	52.566	ug/l	1.48	21,800.03	5.927E-02	Pulse	0.30	3
Mn			2	0.539	ug/l	50.06	472.24	1.284E-03	Pulse	0.30	3
Fe			2	117.025	ug/l	0.46	41,292.78	1.123E-01	Pulse	0.30	3
Co			2	0.082	ug/l	14.95	101.00	2.745E-04	Pulse	0.30	3
Ni			2	2.058	ug/l	10.35	401.12	1.091E-03	Pulse	0.30	3
Cu			2	-2.160	ug/l	-7.32	4,401.75	1.197E-02	Pulse	0.30	3
Zn			2	11.677	ug/l	4.78	1,162.28	3.160E-03	Pulse	0.30	3
As			2	6.304	ug/l	8.99	268.67	7.304E-04	Pulse	1.00	3
Cd			2	0.151	ug/l	13.13	31.84	1.463E-05	Pulse	0.30	3
Sn			2	8.359	ug/l	2.66	1,648.99	7.576E-04	Pulse	0.30	3
Se			3	5.533	ug/l	8.97	90.73	1.552E-04	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,557,192.64	0.81	84.1	Pulse	0.10	3

Quantitation Report

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Sc		5,742,285.75	1.74	92.4	Analog	0.10	3
1	Ge		1,108,633.63	0.54	91.6	Pulse	0.10	3
1	Ge		1,538,649.46	0.65	91.1	Pulse	0.10	3
1	Rh		7,967,666.55	1.21	85.6	Analog	0.10	3
1	In		8,625,034.76	0.46	90.0	Analog	0.10	3
1	Tb		13,787,404.79	0.62	95.0	Analog	0.10	3
1	Ho		14,013,215.21	0.83	94.7	Analog	0.10	3
1	Bi		8,080,043.63	0.57	86.7	Analog	0.10	3
2	Sc		367,811.42	0.34	93.9	Pulse	0.30	3
2	Ge		223,607.30	1.02	92.8	Pulse	0.30	3
2	Ge		336,368.93	0.46	92.5	Pulse	0.30	3
2	Rh		5,901,724.91	0.85	87.8	Analog	0.30	3
2	In		2,176,596.70	1.04	90.9	Pulse	0.30	3
2	Tb		8,564,209.94	0.05	93.4	Analog	0.30	3
2	Ho		8,809,007.15	0.52	93.4	Analog	0.30	3
2	Bi		5,544,750.06	0.71	86.1	Analog	0.30	3
3	Sc		637,518.55	1.29	94.7	Pulse	0.30	3
3	Ge		386,706.20	0.98	93.0	Pulse	0.30	3
3	Ge		584,647.15	0.32	92.8	Pulse	0.30	3
3	Rh		5,780,466.44	0.75	87.4	Analog	0.30	3
3	Tb		10,665,103.74	0.88	93.9	Analog	0.30	3

Quantitation Report

File Name	034_CCV.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 17:17
Sample Name	CCVA
Sample Type	CCV
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	50.664	ug/l	1.31	272,153.62	1.073E-01	Pulse	0.25	3
B			1	104.708	ug/l	1.46	416,634.37	1.643E-01	Pulse	0.15	3
Ca			1	4944.367	ug/l	1.20	3,737,184.01	6.638E-01	Pulse	0.10	3
Sr			1	50.631	ug/l	1.04	2,145,753.46	2.559E-01	Pulse	0.10	3
Mo			1	51.208	ug/l	0.73	396,544.67	4.729E-02	Pulse	0.10	3
Ag			1	49.769	ug/l	0.88	1,014,335.95	1.138E-01	Pulse	0.10	3
Sn			1	48.980	ug/l	1.22	656,748.67	7.366E-02	Pulse	0.10	3
Sb			1	50.027	ug/l	2.07	812,807.41	5.865E-02	Pulse	0.10	3
Ba			1	48.779	ug/l	2.24	334,667.16	2.415E-02	Pulse	0.10	3
Tl			1	49.203	ug/l	2.06	2,305,214.13	2.659E-01	Pulse	0.10	3
Pb			1	49.507	ug/l	2.21	810,569.83	9.352E-02	Pulse	0.10	3
Pb			1	49.255	ug/l	2.25	702,504.91	8.105E-02	Pulse	0.10	3
Pb			1	49.256	ug/l	2.33	3,217,658.78	3.712E-01	Pulse	0.10	3
Na			2	5065.982	ug/l	0.49	6,762,510.70	1.847E+01	Analog	0.30	3
Mg			2	4871.801	ug/l	0.95	3,089,120.01	8.437E+00	Pulse	0.30	3
Al			2	4635.188	ug/l	0.72	1,024,831.97	2.799E+00	Pulse	0.30	3
K			2	4892.177	ug/l	0.47	2,241,866.44	6.123E+00	Pulse	0.30	3
Ca			2	5158.185	ug/l	0.68	125,717.92	3.434E-01	Pulse	0.30	3
Ti			2	48.929	ug/l	3.44	9,052.58	2.473E-02	Pulse	0.30	3
V			2	49.775	ug/l	0.23	313,882.92	8.573E-01	Pulse	0.30	3
Cr			2	49.408	ug/l	0.91	401,923.95	1.098E+00	Pulse	0.30	3
Mn			2	48.587	ug/l	0.41	211,314.88	5.771E-01	Pulse	0.30	3
Fe			2	4931.518	ug/l	0.46	31,232,869.87	8.530E+01	Analog	0.30	3
Co			2	49.056	ug/l	0.22	642,255.54	1.754E+00	Pulse	0.30	3
Ni			2	48.338	ug/l	0.38	169,560.60	4.631E-01	Pulse	0.30	3
Cu			2	48.502	ug/l	0.64	472,006.13	1.289E+00	Pulse	0.30	3
Zn			2	48.288	ug/l	1.50	71,675.61	1.958E-01	Pulse	0.30	3
As			2	50.161	ug/l	0.62	37,976.26	1.037E-01	Pulse	1.00	3
Cd			2	49.870	ug/l	1.55	113,669.67	5.085E-02	Pulse	0.30	3
Sn			2	49.994	ug/l	0.65	227,592.60	1.018E-01	Pulse	0.30	3
Se			3	200.790	ug/l	1.00	50,250.57	8.157E-02	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,535,525.21	0.71	83.4	Pulse	0.10	3
1	Sc		5,630,474.71	1.07	90.6	Analog	0.10	3
1	Ge		1,123,278.11	1.21	92.8	Pulse	0.10	3

Quantitation Report

1	Ge		1,572,906.80	1.61	93.1	Pulse	0.10	3
1	Rh		8,384,770.92	0.74	90.1	Analog	0.10	3
1	In		8,914,657.24	1.61	93.0	Analog	0.10	3
1	Tb		13,858,874.37	0.38	95.5	Analog	0.10	3
1	Ho		14,095,845.62	0.69	95.2	Analog	0.10	3
1	Bi		8,668,192.58	1.85	93.0	Analog	0.10	3
2	Sc		366,140.99	0.28	93.5	Pulse	0.30	3
2	Ge		229,033.23	0.52	95.1	Pulse	0.30	3
2	Ge		346,410.61	1.09	95.3	Pulse	0.30	3
2	Rh		6,228,051.28	0.30	92.6	Analog	0.30	3
2	In		2,235,343.48	0.27	93.3	Pulse	0.30	3
2	Tb		8,723,334.10	0.21	95.2	Analog	0.30	3
2	Ho		8,993,419.09	0.40	95.4	Analog	0.30	3
2	Bi		5,948,514.49	0.91	92.3	Analog	0.30	3
3	Sc		654,641.21	0.91	97.2	Pulse	0.30	3
3	Ge		406,719.00	0.78	97.9	Pulse	0.30	3
3	Ge		616,043.14	0.55	97.8	Pulse	0.30	3
3	Rh		6,162,666.42	0.67	93.2	Analog	0.30	3
3	Tb		11,067,975.95	0.42	97.5	Analog	0.30	3

Quantitation Report

File Name	035_CCB.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 17:22
Sample Name	CCB
Sample Type	CCB
Comment	
Prep Dilution	1.000
Auto Dilution	N/A
Total Dilution	1.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.003	ug/l	118.02	44.00	1.708E-05	Pulse	0.25	3
B			1	2.128	ug/l	3.26	14,310.75	5.544E-03	Pulse	0.15	3
Ca			1	0.501	ug/l	154.63	8,352.36	1.461E-03	Pulse	0.10	3
Sr			1	0.005	ug/l	14.66	803.38	9.224E-05	Pulse	0.10	3
Mo			1	0.164	ug/l	17.77	1,403.45	1.610E-04	Pulse	0.10	3
Ag			1	0.009	ug/l	54.64	220.01	2.443E-05	Pulse	0.10	3
Sn			1	0.255	ug/l	17.19	4,494.16	4.961E-04	Pulse	0.10	3
Sb			1	0.579	ug/l	6.41	7,472.06	5.376E-04	Pulse	0.10	3
Ba			1	0.012	ug/l	80.24	136.67	9.854E-06	Pulse	0.10	3
Tl			1	0.013	ug/l	17.78	613.37	6.882E-05	Pulse	0.10	3
Pb			1	0.015	ug/l	43.55	540.03	6.069E-05	Pulse	0.10	3
Pb			1	0.014	ug/l	35.33	450.02	5.045E-05	Pulse	0.10	3
Pb			1	0.015	ug/l	16.75	2,100.13	2.355E-04	Pulse	0.10	3
Na			2	6.520	ug/l	4.10	20,512.51	5.686E-02	Pulse	0.30	3
Mg			2	0.469	ug/l	8.03	483.35	1.340E-03	Pulse	0.30	3
Al			2	0.565	ug/l	8.94	164.45	4.557E-04	Pulse	0.30	3
K			2	1.482	ug/l	31.80	12,413.63	3.441E-02	Pulse	0.30	3
Ca			2	2.088	ug/l	27.59	142.23	3.942E-04	Pulse	0.30	3
Ti			2	0.020	ug/l	88.76	20.00	5.541E-05	Pulse	0.30	3
V			2	0.002	ug/l	110.01	228.89	6.345E-04	Pulse	0.30	3
Cr			2	0.009	ug/l	148.39	407.79	1.130E-03	Pulse	0.30	3
Mn			2	-0.040	ug/l	-12.00	175.56	4.867E-04	Pulse	0.30	3
Fe			2	1.683	ug/l	4.73	14,492.03	4.017E-02	Pulse	0.30	3
Co			2	0.001	ug/l	26.63	64.40	1.785E-04	Pulse	0.30	3
Ni			2	0.004	ug/l	200.99	51.11	1.414E-04	Pulse	0.30	3
Cu			2	-0.209	ug/l	-9.63	3,357.05	9.306E-03	Pulse	0.30	3

Quantitation Report

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Zn			2	0.036	ug/l	54.95	342.23	9.484E-04	Pulse	0.30	3
As			2	0.014	ug/l	52.18	38.67	1.072E-04	Pulse	1.00	3
Cd			2	0.001	ug/l	406.68	17.62	7.869E-06	Pulse	0.30	3
Sn			2	0.458	ug/l	7.36	1,879.03	8.388E-04	Pulse	0.30	3
Se			3	0.098	ug/l	8.55	50.80	8.256E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,581,516.35	0.91	84.9	Pulse	0.10	3
1	Sc		5,718,872.83	1.03	92.0	Analog	0.10	3
1	Ge		1,130,320.69	0.71	93.4	Pulse	0.10	3
1	Ge		1,577,198.99	0.34	93.4	Pulse	0.10	3
1	Rh		8,709,472.16	1.02	93.6	Analog	0.10	3
1	In		9,045,814.21	1.67	94.4	Analog	0.10	3
1	Tb		13,890,934.79	0.98	95.7	Analog	0.10	3
1	Ho		14,274,673.12	0.43	96.4	Analog	0.10	3
1	Bi		8,912,419.66	1.43	95.6	Analog	0.10	3
2	Sc		360,789.59	0.44	92.1	Pulse	0.30	3
2	Ge		227,474.41	0.63	94.4	Pulse	0.30	3
2	Ge		342,225.73	1.36	94.1	Pulse	0.30	3
2	Rh		6,464,881.27	0.59	96.2	Analog	0.30	3
2	In		2,239,432.22	0.69	93.5	Pulse	0.30	3
2	Tb		8,807,746.87	1.02	96.1	Analog	0.30	3
2	Ho		9,096,444.08	0.21	96.5	Analog	0.30	3
2	Bi		6,153,868.37	1.28	95.5	Analog	0.30	3
3	Sc		647,530.10	0.88	96.2	Pulse	0.30	3
3	Ge		408,248.52	0.23	98.2	Pulse	0.30	3
3	Ge		615,277.20	0.55	97.7	Pulse	0.30	3
3	Rh		6,334,476.56	1.50	95.8	Analog	0.30	3
3	Tb		10,948,545.68	0.58	96.4	Analog	0.30	3

Quantitation Report

File Name	036SMPL.d
File Path	C:\Agilent\ICPMH\1\DATA\xa101020m2.b
Method File	
Method Path	
Acq Time	1/10/2020 17:27
Sample Name	JD1056-3F
Sample Type	Sample
Comment	
Prep Dilution	100.000
Auto Dilution	N/A
Total Dilution	100.000
Operator Name	admin
Acq Mode	Spectrum
Cal Title	
Cal Type	External Calibration
Last Calib	1/13/2020 6:32
Bkg File	
Bkg Mode	Count Subtraction except for ISTD
Interference File	
FQ Blank File	
VIS Fit	Point to Point

Tune Step	Tune File
1	
2	
3	

FullQuant Table

Element	Mass	ISTD	Tune	Conc	Units	RSD(%)	CPS	Ratio	Det	Time(sec)	Rep
Be			1	0.091	ug/l	202.18	34.67	1.363E-05	Pulse	0.25	3
B			1	244.623	ug/l	1.99	15,340.54	6.036E-03	Pulse	0.15	3
Ca			1	382002.629	ug/l	1.21	2,955,071.52	5.131E-01	Pulse	0.10	3
Sr			1	1917.922	ug/l	0.79	806,632.64	9.698E-02	Pulse	0.10	3
Mo			1	15.596	ug/l	7.03	1,276.76	1.535E-04	Pulse	0.10	3
Ag			1	0.686	ug/l	34.15	173.34	1.950E-05	Pulse	0.10	3
Sn			1	21.635	ug/l	10.20	3,900.64	4.388E-04	Pulse	0.10	3
Sb			1	40.148	ug/l	2.67	4,557.50	3.287E-04	Pulse	0.10	3
Ba			1	1740.257	ug/l	1.50	119,491.36	8.618E-03	Pulse	0.10	3
Tl			1	0.417	ug/l	14.27	190.01	2.251E-05	Pulse	0.10	3
Pb			1	3.903	ug/l	13.75	900.06	1.066E-04	Pulse	0.10	3
Pb			1	4.133	ug/l	20.56	800.05	9.483E-05	Pulse	0.10	3
Pb			1	4.238	ug/l	8.85	3,743.66	4.435E-04	Pulse	0.10	3
Na			2	9072198.131	ug/l	1.46	120,973,892.97	3.302E+02	Analog	0.30	3
Mg			2	34087.966	ug/l	1.51	216,473.06	5.908E-01	Pulse	0.30	3
Al			2	83.434	ug/l	19.84	226.67	6.183E-04	Pulse	0.30	3
K			2	30986.074	ug/l	1.48	153,261.35	4.183E-01	Pulse	0.30	3
Ca			2	411138.526	ug/l	1.09	100,290.38	2.737E-01	Pulse	0.30	3
Ti			2	25.892	ug/l	3.67	64.44	1.759E-04	Pulse	0.30	3
V			2	2.591	ug/l	12.65	385.56	1.053E-03	Pulse	0.30	3
Cr			2	97.341	ug/l	2.73	8,254.37	2.253E-02	Pulse	0.30	3
Mn			2	-2.733	ug/l	-25.97	234.45	6.404E-04	Pulse	0.30	3
Fe			2	256.988	ug/l	3.75	20,340.42	5.551E-02	Pulse	0.30	3
Co			2	0.098	ug/l	125.58	59.95	1.633E-04	Pulse	0.30	3
Ni			2	5.391	ug/l	18.63	227.78	6.212E-04	Pulse	0.30	3
Cu			2	-16.809	ug/l	-4.09	3,807.15	1.039E-02	Pulse	0.30	3
Zn			2	31.847	ug/l	15.69	765.59	2.088E-03	Pulse	0.30	3
As			2	6.028	ug/l	11.95	74.67	2.037E-04	Pulse	1.00	3
Cd			2	1.295	ug/l	59.10	44.33	2.015E-05	Pulse	0.30	3
Sn			2	35.392	ug/l	3.34	1,380.08	6.270E-04	Pulse	0.30	3
Se			3	6.885	ug/l	16.72	42.47	7.082E-05	Pulse	5.00	3

ISTD Table

Tune	Element	Mass	CPS	RSD(%)	ISTD Recovery%	Det	Time(sec)	Rep
1	Li		2,541,346.98	0.44	83.6	Pulse	0.10	3

Current Signal

[1]

Mass	Range	Count	Avg. Count	RSD [%]
7	5000	2305	2345.6	1.50
59	5000	2901	2958.4	2.72
89	10000	4905	5000.9	2.65
140	10000	5567	5390.5	2.52
205	5000	4417	4211.7	4.27
156/140	1	0.826 %	0.667 %	23.57
70/140	2	1.222 %	1.175 %	19.98
9	20	3	3.5	16.50
11	1000	509	548.1	9.82
88	100	37	47.0	24.99
95	20	6	5.5	23.47
107	20	3	3.5	71.90
121	20	18	15.3	22.32
137	50	14	17.0	22.53
208	50	26	28.5	7.30
Integration Time [sec]		0.10		

Plasma Parameters

RF Power	1500	W	Nebulizer Pump	0.10	rps
RF Matching	1.80	V	S/C Temp	2	℃
Smpl Depth	7.8	mm	Gas Switch	Dilution Gas	
Carrier Gas	0.55	L/min	Makeup/Dilution Gas	0.55	L/min
Option Gas	0.0	%			

Lenses Parameters

Extract 1	0.0	V	Cell Entrance	-40	V
Extract 2	-165.0	V	Cell Exit	-58	V
Omega Bias	-80	V	Deflect	15.2	V
Omega Lens	7.8	V	Plate Bias	-45	V

Cell Parameters

Use Gas	false		OctP Bias	-8.0	V
He Flow	0.0	mL/min	OctP RF	200	V
H2 Flow	0.0	mL/min	Energy Discrimination	5.0	V
3rd Gas Flow	0	%			

Meters

IF/BK Press	2.65E+2	Pa	TMP Revolution	100.0	%
Analyzer Press	1.29E-4	Pa	Water Temp	23.4	℃
Reflected Power	1	W			

US EPA Tune Check Sample Report

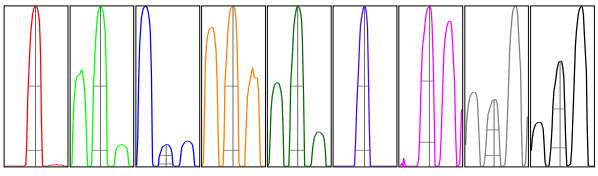
Batch Folder C:\Agilent\ICPMH\1\DATA\xa011020m1.b
Report Comment
Instrument Name G3281A JP10340551

[1]

Mass	Count (Mean)	RSD% (Actual)	RSD% (Required)	RSD% (Flag)
9	80502	0.70	5.00	
24	328047	0.97	5.00	
25	43711	0.24	5.00	
26	51083	0.86	5.00	
59	402787	0.37	5.00	
115	628370	0.39	5.00	
206	192538	0.29	5.00	
207	178990	0.55	5.00	
208	420188	1.04	5.00	

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	79717	80782	81080	80128	80805
24	322570	329023	328501	329298	330844
25	43582	43801	43829	43645	43698
26	51821	50719	50990	50777	51106
59	402100	404649	400881	403862	402443
115	624044	629860	629570	629663	628711
206	191882	192252	193285	192362	192910
207	177833	180508	178671	179269	178670
208	415691	421629	425357	422667	415593

Integration Time [sec] = 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	Width-X% (Actual)	Width-X% (Required)	Width-X% (Flag)
9	13665	9.00	8.9 - 9.1		0.747	0.900	
24	56377	23.95	23.9 - 24.1		0.716	0.900	
25	7578	24.95	24.9 - 25.1		0.686	0.900	
26	8759	26.00	25.9 - 26.1		0.717	0.900	
59	70727	58.95	58.9 - 59.1		0.715	0.900	
115	120299	115.00	114.9 - 115.1		0.699	0.900	
206	33770	205.95	205.9 - 206.1		0.723	0.900	
207	30496	206.90	206.9 - 207.1		0.713	0.900	
208	73042	207.90	207.9 - 208.1		0.720	0.900	

X% = 10 **Integration Time [sec] =** 0.1 **Acquisition Time [sec] =** 235 **Y Axis =** Linear

Tune Parameters

Plasma Paramters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
RF Power	1500	W	Carrier Gas	0.55	L/min			
RF Matching	1.80	V	Option Gas	0.0	%			
Smpl Depth	7.8	mm	Nebulizer Pump	0.10	rps			
S/C Temp	2	℃						

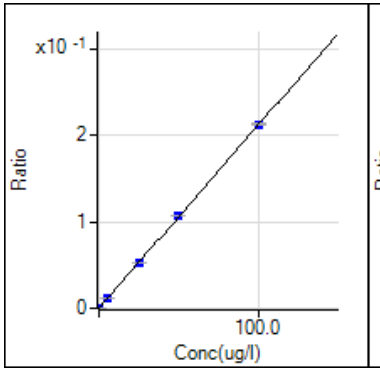
Lenses Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Extract 1	0.0	V	Omega Lens	7.8	V			
Extract 2	-165.0	V	Cell Entrance	-40	V			
Omega Bias	-80	V	Cell Exit	-58	V			
Deflect	15.2	V						

Cell Parameters

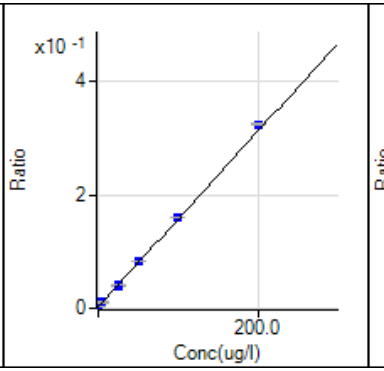
ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Use Gas	false		3rd Gas Flow	0	%			
He Flow	0.0	mL/min	OctP Bias	-8.0	V			
H2 Flow	0.0	mL/min	OctP RF	200	V			
Energy Discrimination	5.0	V						

Calibration for C:\Agilent\ICPMH\1\DATA\xa101020m2.b\084_CCB.d



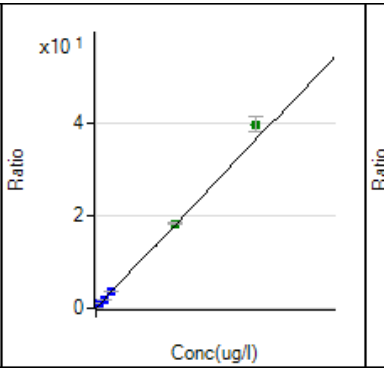
9 Be [1] / ISTD: 6 Li
y = 2.118E-3 x + 1.170E-5

R	1.0000
DL	0.006087
BEC	0.005523



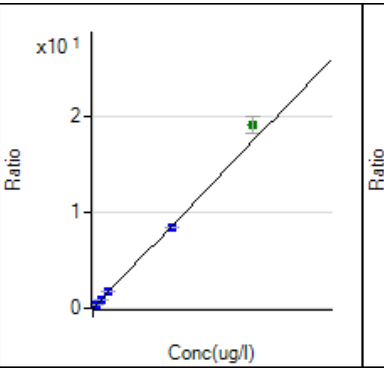
11 B [1] / ISTD: 6 Li
y = 1.548E-3 x + 2.250E-3

R	0.9999
DL	0.05871
BEC	1.454



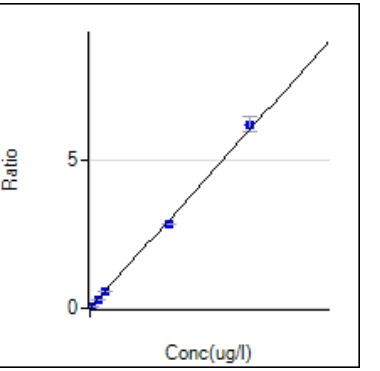
23 Na [2] / ISTD: 45 Sc
y = 3.639E-3 x + 3.313E-2

R	0.9993
DL	0.4733
BEC	9.103



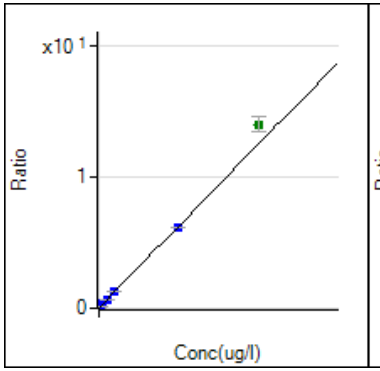
24 Mg [2] / ISTD: 45 Sc
y = 1.732E-3 x + 5.282E-4

R	0.9985
DL	0.07785
BEC	0.305



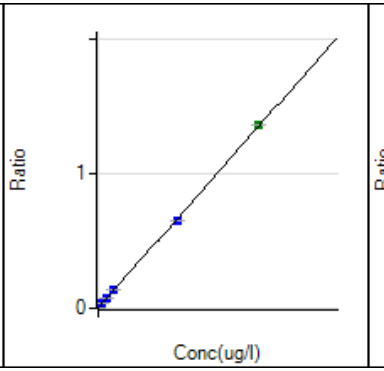
27 Al [2] / ISTD: 45 Sc
y = 6.038E-4 x + 1.145E-4

R	0.9992
DL	0.1501
BEC	0.1897



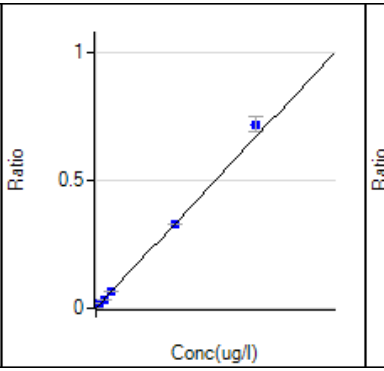
39 K [2] / ISTD: 45 Sc
y = 1.245E-3 x + 3.256E-2

R	0.9982
DL	1.444
BEC	26.16



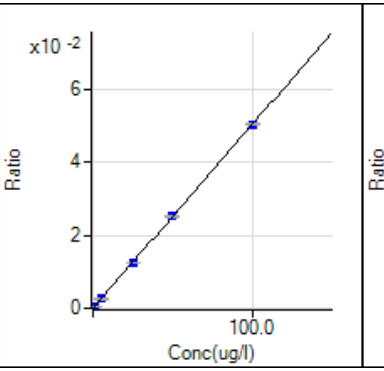
44 Ca [1] / ISTD: 45 Sc
y = 1.340E-4 x + 1.394E-3

R	0.9997
DL	1.899
BEC	10.41



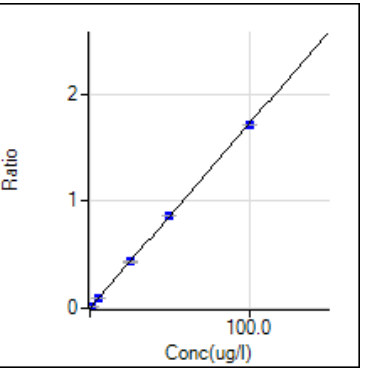
44 Ca [2] / ISTD: 45 Sc
y = 6.652E-5 x + 2.553E-4

R	0.9991
DL	2.168
BEC	3.839



47 Ti [2] / ISTD: 45 Sc
y = 5.044E-4 x + 4.527E-5

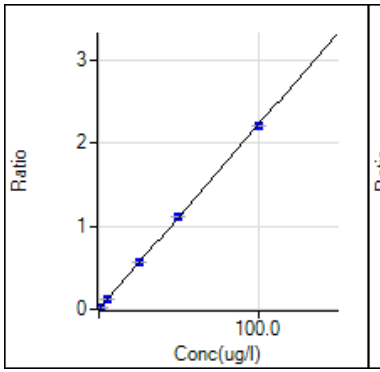
R	1.0000
DL	0.2951
BEC	0.08976



51 V [2] / ISTD: 45 Sc
y = 1.721E-2 x + 6.068E-4

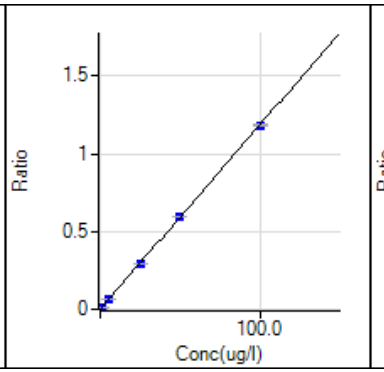
R	1.0000
DL	0.01076
BEC	0.03526

Calibration for C:\Agilent\ICPMH\1\DATA\xa101020m2.b\084_CCB.d



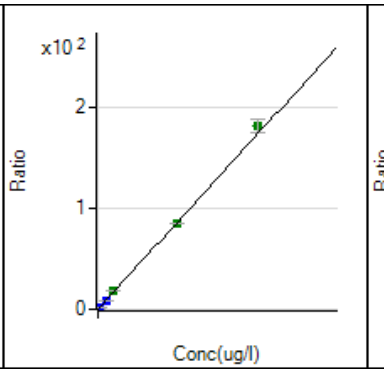
52 Cr [2] / ISTD: 45 Sc
y = 2.220E-2 x + 9.228E-4

R	1.0000
DL	0.006669
BEC	0.04157



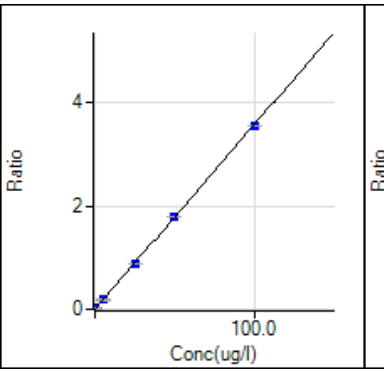
55 Mn [2] / ISTD: 45 Sc
y = 1.186E-2 x + 9.645E-4

R	1.0000
DL	0.01855
BEC	0.08133



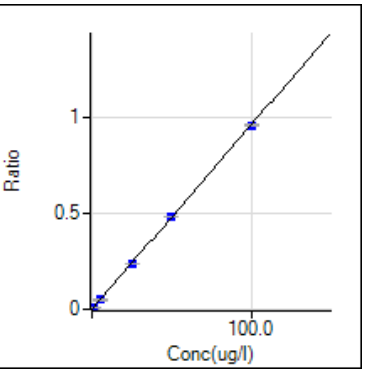
56 Fe [2] / ISTD: 45 Sc
y = 1.730E-2 x + 1.107E-2

R	0.9996
DL	0.08969
BEC	0.64



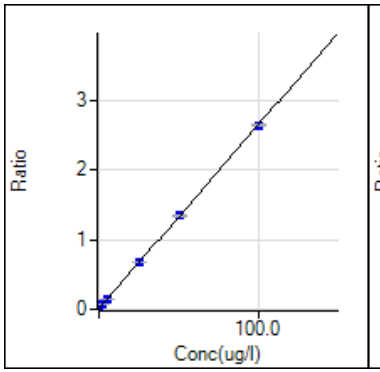
59 Co [2] / ISTD: 45 Sc
y = 3.576E-2 x + 1.282E-4

R	1.0000
DL	0.002484
BEC	0.003587



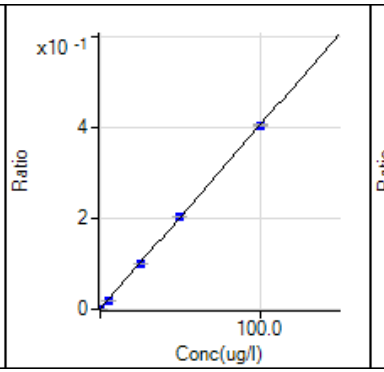
60 Ni [2] / ISTD: 45 Sc
y = 9.578E-3 x + 1.049E-4

R	1.0000
DL	0.01064
BEC	0.01095



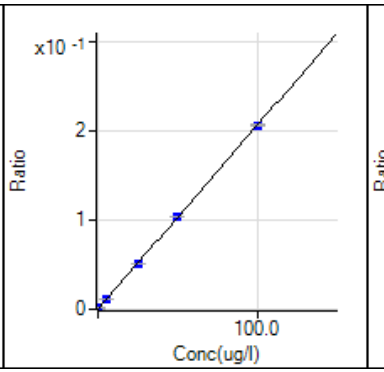
63 Cu [2] / ISTD: 45 Sc
y = 2.627E-2 x + 1.481E-2

R	1.0000
DL	0.05771
BEC	0.5635



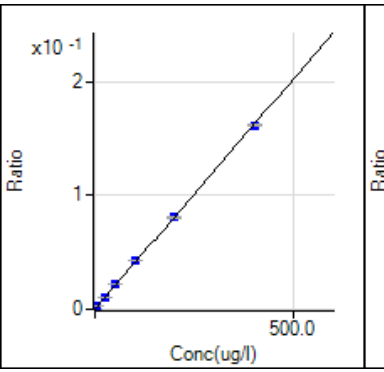
66 Zn [2] / ISTD: 45 Sc
y = 4.037E-3 x + 8.025E-4

R	1.0000
DL	0.02928
BEC	0.1988



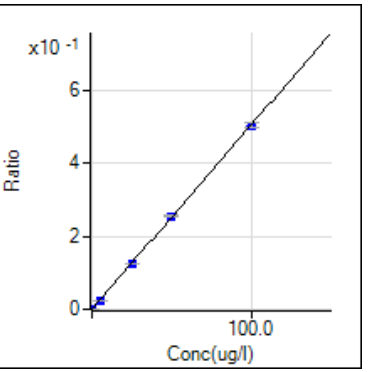
75 As [2] / ISTD: 45 Sc
y = 2.066E-3 x + 7.914E-5

R	1.0000
DL	0.01509
BEC	0.0383



78 Se [3] / ISTD: 74 Ge
y = 4.060E-4 x + 4.286E-5

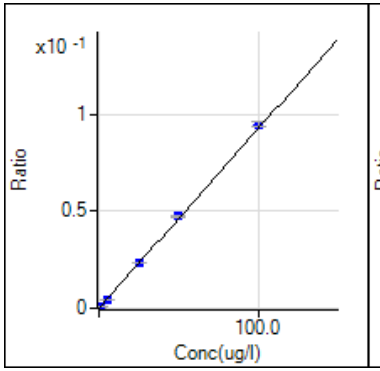
R	0.9998
DL	0.04373
BEC	0.1056



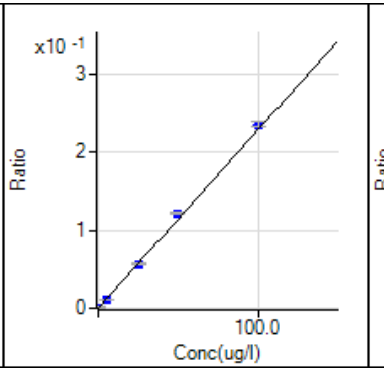
88 Sr [1] / ISTD: 103 Rh
y = 5.053E-3 x + 6.591E-5

R	1.0000
DL	0.005935
BEC	0.01304

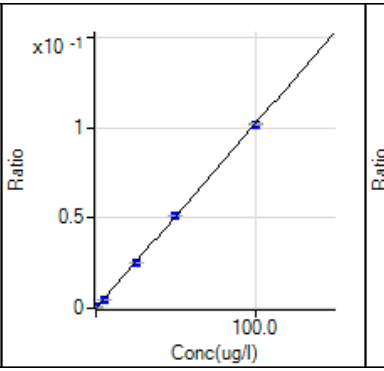
Calibration for C:\Agilent\ICPMH\1\DATA\xa101020m2.b\084_CCB.d



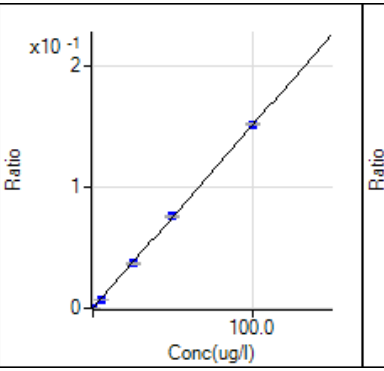
95 Mo [1] / ISTD: 103 Rh
y = 9.233E-4 x + 9.547E-6
R 1.0000
DL 0.00326
BEC 0.01034



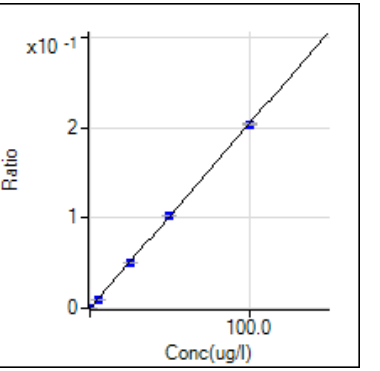
107 Ag [1] / ISTD: 115 In
y = 2.286E-3 x + 3.826E-6
R 0.9998
DL 0.00284
BEC 0.001673



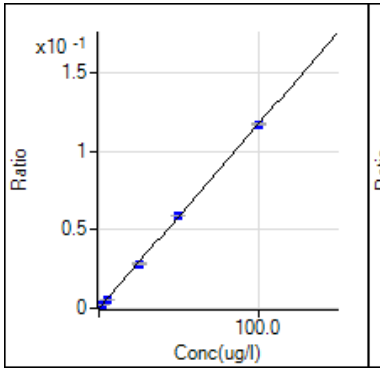
111 Cd [2] / ISTD: 115 In
y = 1.019E-3 x + 6.950E-6
R 1.0000
DL 0.007047
BEC 0.006817



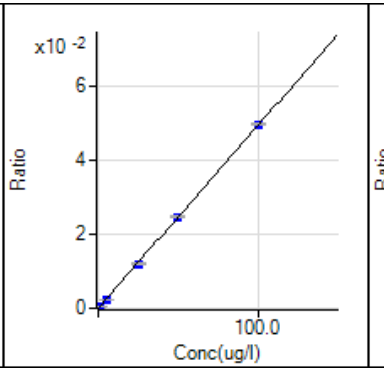
118 Sn [1] / ISTD: 115 In
y = 1.502E-3 x + 1.139E-4
R 1.0000
DL 0.02062
BEC 0.07585



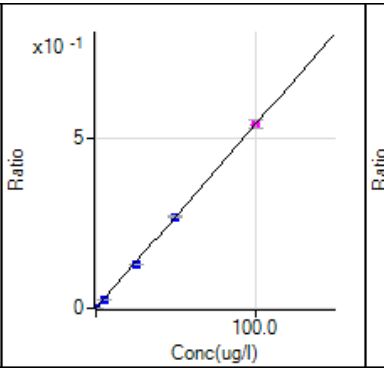
118 Sn [2] / ISTD: 115 In
y = 2.038E-3 x - 9.441E-5
R 1.0000
DL 0.03831
BEC -0.04631



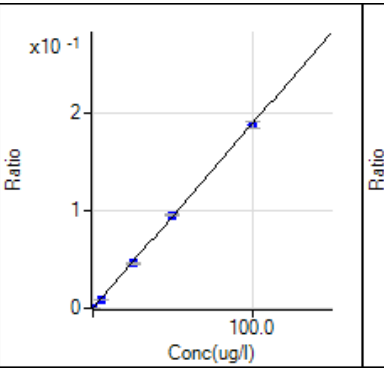
121 Sb [1] / ISTD: 159 Tb
y = 1.175E-3 x - 1.431E-4
R 1.0000
DL 0.01162
BEC -0.1218



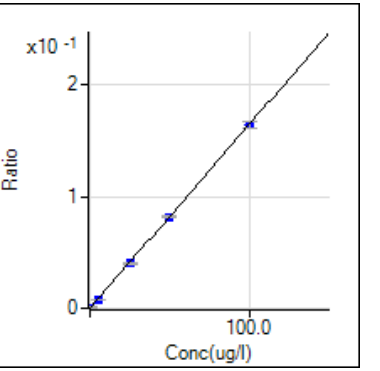
137 Ba [1] / ISTD: 159 Tb
y = 4.950E-4 x + 4.081E-6
R 1.0000
DL 0.01337
BEC 0.008244



205 Tl [1] / ISTD: 209 Bi
y = 5.405E-3 x
R 0.9999
DL 0.002358
BEC 0

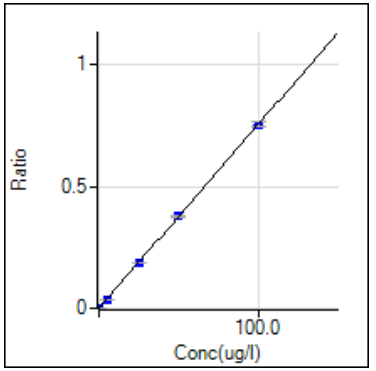


206 Pb [1] / ISTD: 209 Bi
y = 1.888E-3 x + 3.291E-5
R 1.0000
DL 0.004739
BEC 0.01743



207 Pb [1] / ISTD: 209 Bi
y = 1.645E-3 x + 2.683E-5
R 1.0000
DL 0.009036
BEC 0.01631

Calibration for C:\Agilent\ICPMH\1\DATA\xa101020m2.b\084_CCB.d



208 Pb [1] / ISTD: 209 Bi

y = 7.534E-3 x + 1.242E-4

R	1.0000
DL	0.002973
BEC	0.01648

SGS North America Inc.

Aqueous Metals Digestion Form

Batch Information

Batch ID	Start Date	Start Time	End Date	End time	QC Samp 1	QC Samp 2
MP19163	1/8/2020	11:00	1/8/2020	16:30	JD1056-1F	

Temperature

		Block ID1	Therm. ID#	Temperature	Correction	Corrected Temp
1	Start	7	6433196	95	0	95
1	End	7	6433196	93	0	93
2	Start					
2	End					

Methods and Equipment

	Dig. Method	Heating Method		Auto Pipette #	Digestion Tube Lot #	
	SW846 3010A	Digestion Block		M-74	1906257	

Sample ID	Bottle Number	Pres (Y/N)	Initial Sample Volume	Final Volume in ML	Reagent Groups Added	Spike Groups Added	Comments
MP19163-MB1	N/A	N	50	50	AB		
MP19163-B1	N/A	N	50	50	AB	ABCD	
MP19163-S1	1	Y	10	50	AB	ABCD	*
MP19163-S2	1	Y	10	50	AB	ABCD	*
MP19163-SD1	1	Y	50	50	AB		*
JD1056-1F	1	Y	10	50	AB		*
JD1056-2F	1	Y	50	50	AB		*
JD1056-3F	1	Y	50	50	AB		*
JD1056-4F	1	Y	5	50	AB		*
JD1056-5F	1	Y	5	50	AB		*
JD1056-6F	1	Y	50	50	AB		*
JD1056-7F	1	Y	50	50	AB		*
JD1172-1	1	Y	50	50	AB		
JD1229-1	1	Y	50	50	AB		
JD1229-1F	2	Y	50	50	AB		
JD1237-1A	1	Y	50	50	AB		
JD1237-1FA	2	Y	50	50	AB		
JD1237-2A	1	Y	50	50	AB		
JD1237-2FA	2	Y	50	50	AB		
JD1237-3A	1	Y	50	50	AB		
MP19163-B2	N/A	N	50	50	AB	EFGHI	
MP19163-S3	1	Y	10	50	AB	EFGHI	*
MP19163-S4	1	Y	10	50	AB	EFGHI	*

Reagents Groups

Group	Description	MLs Used
A	CONC HNO3	3
B	1:1 HCL	5
C		
D		
E		
F		
G		
H		

Spike Groups

Group	Description	MLs Used
A	ACCUTEST 13A REV1	0.5
B	ACCUTEST 14A REV1	0.5
C	MINERALS 5000 PPM	0.25
D	AG 20 PPM	0.625
E	ACCUTEST 13B REV1	0.2
F	ACCUTEST 14B REV1	0.2
G	MINERALS 1000 PPM	0.2
H	AG 20 PPM	0.2
I		

Comments: *LIMITED VOLUME

Analyst TAYLORG **Approved by** Wendyz **Approved on** 1/9/2020

Note: Reagent traceability for batch Start Date can be seen on the reagent traceability page for this batch.
Serial Dilution samples shown for QC purposes only.
Acceptable Temperature range is 90-95 degrees C unless otherwise noted

Document Control #: NJ-MET-PREP-AQ-01 (24564684378704432) Validated by: Validated on:

SGS North America Inc.

Aqueous Metals Digestion Form

Batch Information

Batch ID	Start Date	Start Time	End Date	End time	QC Samp 1	QC Samp 2
MP19163	1/8/2020	11:00	~~1/8/2020~~ 1/9/2020	~~10:30~~ 9:15	JD1056-1F	

Temperature

		Block ID1	Therm. ID#	Temperature	Correction	Corrected Temp
1	Start	7	6433196	95	0	95
1	End	7	6433196	93	0	93
2	Start					
2	End					

Methods and Equipment

	Dig. Method	Heating Method		Auto Pipette #	Digestion Tube Lot #	
	SW846 3010A	Digestion Block		M-74	1906257	

Sample ID	Bottle Number	Pres (Y/N)	Initial Sample Volume	Final Volume in ML	Reagent Groups Added	Spike Groups Added	Comments
MP19163-MB1	N/A	N	50	50	AB		
MP19163-B1	N/A	N	50	50	AB	ABCD	
MP19163-S1	1	Y	10	50	AB	ABCD	*
MP19163-S2	1	Y	10	50	AB	ABCD	*
MP19163-SD1	1	Y	~~50~~ 10	50	AB		*
JD1056-1F	1	Y	10	50	AB		*
JD1056-2F	1	Y	50	50	AB		*
JD1056-3F	1	Y	50	50	AB		*
JD1056-4F	1	Y	~~50~~ 5	50	AB		** * Started @ 16:15
JD1056-5F	1	Y	~~50~~ 5	50	AB		** * Started @ 16:15
JD1056-6F	1	Y	50	50	AB		*
JD1056-7F	1	Y	50	50	AB		*
JD1172-1	1	Y	50	50	AB		
JD1229-1	1	Y	50	50	AB		
JD1229-1F	2	Y	50	50	AB		
JD1237-1A	1	Y	50	50	AB		
JD1237-1FA	2	Y	50	50	AB		
JD1237-2A	1	Y	50	50	AB		
JD1237-2FA	2	Y	50	50	AB		
JD1237-3A	1	Y	50	50	AB		
MP19163-B2	N/A	N	50	50	AB	EFGHI	
MP19163-S3	1	Y	10	50	AB	EFGHI	*
MP19163-S4	1	Y	10	50	AB	EFGHI	*

Reagents Groups

Group	Description	MLs Used
A	CONC HNO3	3
B	1 1 HCL	5
C		
D		
E		
F		
G		
H		

Spike Groups

Group	Description	MLs Used
A	ACCUTEST 13A REV1	0 5
B	ACCUTEST 14A REV1	0 5
C	MINERALS 5000 PPM	0 25
D	AG 20 PPM	0 625
E	ACCUTEST 13B REV1	0 2
F	ACCUTEST 14B REV1	0 2
G	MINERALS 1000 PPM	0 2
H	AG 20 PPM	0 2
I	SE 20ppm	0.8

Comments: *LIMITED VOLUME
** Solidified with 50 ml.

Analyst TAYLORG Approved by _____ Approved on _____

Note: Reagent traceability for batch Start Date can be seen on the reagent traceability page for this batch.
Serial Dilution samples shown for QC purposes only.
Acceptable Temperature range is 90-95 degrees C unless otherwise noted

7.3.1

7

SGS

Metals Digestion Reagents Information Log

Digestion Batch ID: MP 19163 **Date:** 1/8/20

Matrix: ALL

Standard/Reagent Type	Exp. Date	Standard/Reagent ID
Spiking Solution - (ACCUTEST-13A REV1)	4/30/2020	MP-015-1257
Spiking Solution - (ACCUTEST-14A REV1)	5/27/2020	MP-015-1258
Spiking Solution - 5000 mg/l Minerals	1/8/2021	P2-MEB687401 MFG: INO. VENT.
Spiking Solution - Sulfur 1000ppm	9/25/2021	LOT: 092518 MFG: ABS. STANDARDS
Spiking Solution - Si 1000ppm	9/24/2020	P2-SI676242 MFG: INO. VENT.
Spiking Solution - Bi 1000ppm	8/29/2020	N2-BI669548 MFG: INO. VENT.
Spiking Solution - Se 20ppm	6/5/2020	MP-015-1266
Spiking Solution - Li 1000ppm	11/4/2020	P2-LI675235 MFG: INO. VENT.
Spiking Solution- Ag 20 ppm	6/19/2020	MP-015-1264
Spiking Solution - (ACCUTEST-13B REV1)	4/30/2020	MP-015-1262
Spiking Solution - (ACCUTEST-14B REV1)	6/11/2020	MP-015-1263
Spiking Solution - 1000ppm Minerals	5/27/2020	MP-015-1254
Spiking Solution- P		
Nitric Acid	1/7/2022	LOT: 237365 MFG: J.T. BAKER
Nitric Acid (1:1)	7/7/2020	MP-018-42-376 1:1 HNO3
Hydrochloric Acid	1/2/2022	LOT: 240180 MFG: BAKER
Hydrochloric Acid (1:1)	7/2/2020	MP-018-42-367 1:1 HCL
Hydrogen Peroxide	12/30/2021	LOT: 192235 MFG: FISHER
Soil Lab Control/Soil LC	10/22/2022	LOT: D105-540 MFG: ERA
Teflon Chips(For Soil MB and Blank Spike)	N/A	LOT: 24635764 MFG: SAINT-GOBAIN
Digestion Tubes	N/A	LOT: 1906257 MFG: ENV. EXPRESS
pH Paper	11/1/2021	LOT: 231018 MFG: HYDRION
Filter paper Q8	N/A	LOT: 16939084 MFG: FISHER
Filter paper 0.45µm	N/A	LOT: F9HA99962E MFG: FISHER

Spike witnessed By: _____

Validated By: _____

Validated On: _____

Metals Prep Reagent
1/17/18

7.3.1

7

Date 1/10/2020 Analyst ND MP # 19163A 19183

Post spike for ICP Method 6010D

QC sample #

Spiking solution	Elements	Spike added (Y/N)	Vendor	Intermediate Lot #	Exp. Date	Conc. (mg/l)	Amt of Spike added (ml)	Digestate sample volume (ml)	Final Digestate volume in ml (Spike+ Sample)	Final Conc at the instrument (mg/l)
Mixed ICP intermediate Metals Solution (ACCUTEST-13A-REV1)	Ba,Be,B Cd,Cr,Co,Cu,Pb, Mn,Ni,P,Se,Sr,TL, V,Zn	Yes	in house	MP-015-1242	4/28/20	200	0.2	19.25	20	2
Mixed ICP intermediate Metals Solution (ACCUTEST-14A-REV1)	Sb,As,Mo,Sn,Ti, W,Zr	Yes	in house	MP-015-1243	4/28/20	200	0.2			2
Ag Spike Intermediate	Ag	Yes	in house	MP-015-1249	5/13/20	20	0.25			0.25
Metals Mix	Ca,Al,Fe,Mg,K, Na	Yes	inorganic Venture	B-MEB 678659	4/25/20	5000	0.1			25
S spike	S					200	0.2			2
Bi Spike	Bi					200	0.2			2
Li Spike	Li					200	0.2			2
Si spike	Si					1000	0.1			5

Form: DAYT-MET-0095-01-FORM
Rev. Date : 7/10/2018

Reviewed by:

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

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						
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

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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 - 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	

eurofins | Environment Testing America

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

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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 - 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

Analytical Test Method

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	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: 11/11/20 1700 ETA
Received by Laboratory Condition
CSBanda 11-12-20 0910

CSBanda 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

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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 - 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	

eurofins | Environment Testing America

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

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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

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:

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WG	Ground Water

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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:

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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:
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SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
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WG	Ground Water

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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	

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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

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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: CSBaude
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: [signature]
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: [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						
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
					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	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:
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SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As
SW9056A (A) = Cl SO4
SW9060A/FLDFLT (B) = DOC

Equipment:

Code	Matrix
WG	Ground Water

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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	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	

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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	

eurofins | Environment Testing America

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

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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: 680-190870-1

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

Diane Clapper 10-30-20 1710
[signature] 10/30/20 17:10

Date
Time
Shipping Date:
Received by Laboratory:
Condition:

[signature] 10/30/20 17:30
[signature] TN 10-31-20 1005
4.1/4.4 4.3/4.6

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 #

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

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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: 680-190885-1

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
					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				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

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: 680-190931-1

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

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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: 680-191084-1

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

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

680-191084-03 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:
Date
Time
Received by: [signature]
SHL_eCOC
11/3/20 1500

[signature]
11-3-20 1500

Relinquished by: [signature]
Date 11/4/20
Time 1700
Shipping Date:
Received by Laboratory:
Condition:

[signature]
11-5-20
930 TA

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

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	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

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	

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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

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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
					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	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]
Received by Laboratory: 11/5/20 17:00
Condition:

[signature] TA
11-6-20 950

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	

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ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-184098-1
Client Project/Site: JV, LTM - SHL Spring 2020

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Authorized for release by:
6/8/2020 10:35:00 AM
Eddie Barnett, Project Manager I
(912)250-0280
eddie.barnett@testamericainc.com

Designee for

Kathryn Smith, Client Service Manager
(912)250-0275
kathy.smith@testamericainc.com

LINKS

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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.

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

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.
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
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)
MQL	Method Quantitation Limit
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)

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
680-184098-4	EPA-PZ-2012-2B-SPR20	Water	05/20/20 09:05	05/21/20 09:15	
680-184098-5	SHL-4-SPR20	Water	05/20/20 09:40	05/21/20 09:15	
680-184098-6	SHL-DUP03-SPR20	Water	05/20/20 11:30	05/21/20 09:15	
680-184098-7	SHM-11-06-SPR20	Water	05/20/20 11:30	05/21/20 09:15	
680-184098-8	SHM-13-04-SPR20	Water	05/20/20 15:35	05/21/20 09:15	
680-184098-9	SHP-01-36X-SPR20	Water	05/20/20 13:00	05/21/20 09:15	
680-184098-10	SHP-01-37X-SPR20	Water	05/20/20 11:10	05/21/20 09:15	
680-184098-11	SHP-2016-07A-SPR20	Water	05/20/20 13:45	05/21/20 09:15	
680-184098-12	SHP-2016-2A-SPR20	Water	05/20/20 10:40	05/21/20 09:15	
680-184098-13	SHP-2016-2B-SPR20	Water	05/20/20 09:20	05/21/20 09:15	
680-184098-14	SHP-2016-3A-SPR20	Water	05/20/20 15:25	05/21/20 09:15	
680-184098-15	SHP-2016-3B-SPR20	Water	05/20/20 13:50	05/21/20 09:15	

Job ID: 680-184098-1

Laboratory: Eurofins TestAmerica, Savannah

Narrative

CASE NARRATIVE
Client: Seres Engineering & Services LLC
Project: JV, LTM - SHL Spring 2020

Report Number: 680-184098-1

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 05/21/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 2.5º C.

METALS (ICP) - DISSOLVED
Samples EPA-PZ-2012-2B-SPR20 (680-184098-4), SHL-4-SPR20 (680-184098-5), SHL-DUP03-SPR20 (680-184098-6), SHM-11-06-SPR20 (680-184098-7), SHM-13-04-SPR20 (680-184098-8), SHP-01-36X-SPR20 (680-184098-9), SHP-01-37X-SPR20 (680-184098-10), SHP-2016-07A-SPR20 (680-184098-11), SHP-2016-2A-SPR20 (680-184098-12), SHP-2016-2B-SPR20 (680-184098-13), SHP-2016-3A-SPR20 (680-184098-14) and SHP-2016-3B-SPR20 (680-184098-15) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/27/2020 and analyzed on 05/28/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICPMS) - DISSOLVED
Samples EPA-PZ-2012-2B-SPR20 (680-184098-4), SHL-4-SPR20 (680-184098-5), SHL-DUP03-SPR20 (680-184098-6), SHM-11-06-SPR20 (680-184098-7), SHM-13-04-SPR20 (680-184098-8), SHP-01-36X-SPR20 (680-184098-9), SHP-01-37X-SPR20 (680-184098-10), SHP-2016-07A-SPR20 (680-184098-11), SHP-2016-2A-SPR20 (680-184098-12), SHP-2016-2B-SPR20 (680-184098-13), SHP-2016-3A-SPR20 (680-184098-14) and SHP-2016-3B-SPR20 (680-184098-15) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 05/27/2020 and analyzed on 05/28/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ALKALINITY
Samples EPA-PZ-2012-2B-SPR20 (680-184098-4), SHL-4-SPR20 (680-184098-5), SHL-DUP03-SPR20 (680-184098-6), SHM-11-06-SPR20 (680-184098-7), SHM-13-04-SPR20 (680-184098-8), SHP-01-36X-SPR20 (680-184098-9), SHP-01-37X-SPR20 (680-184098-10), SHP-2016-07A-SPR20 (680-184098-11), SHP-2016-2A-SPR20 (680-184098-12), SHP-2016-2B-SPR20 (680-184098-13), SHP-2016-3A-SPR20 (680-184098-14) and SHP-2016-3B-SPR20 (680-184098-15) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 05/28/2020.

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-2012-2B-SPR20 (680-184098-4), SHL-4-SPR20 (680-184098-5), SHL-DUP03-SPR20 (680-184098-6), SHM-11-06-SPR20 (680-184098-7), SHM-13-04-SPR20 (680-184098-8), SHP-01-36X-SPR20 (680-184098-9), SHP-01-37X-SPR20 (680-184098-10), SHP-2016-07A-SPR20 (680-184098-11), SHP-2016-2A-SPR20 (680-184098-12), SHP-2016-2B-SPR20 (680-184098-13), SHP-2016-3A-SPR20 (680-184098-14) and SHP-2016-3B-SPR20 (680-184098-15) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 06/01/2020 and 06/02/2020.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON (TOC)

Job ID: 680-184098-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

Samples EPA-PZ-2012-2B-SPR20 (680-184098-4), SHL-4-SPR20 (680-184098-5), SHL-DUP03-SPR20 (680-184098-6), SHM-11-06-SPR20 (680-184098-7), SHM-13-04-SPR20 (680-184098-8), SHP-01-36X-SPR20 (680-184098-9), SHP-01-37X-SPR20 (680-184098-10), SHP-2016-07A-SPR20 (680-184098-11), SHP-2016-2A-SPR20 (680-184098-12), SHP-2016-2B-SPR20 (680-184098-13), SHP-2016-3A-SPR20 (680-184098-14) and SHP-2016-3B-SPR20 (680-184098-15) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 06/04/2020 and 06/05/2020.

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: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

Client Sample ID: EPA-PZ-2012-2B-SPR20

Lab Sample ID: 680-184098-4

Date Collected: 05/20/20 09:05
Date Received: 05/21/20 09:15
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	31		0.50	0.20	mg/L			06/01/20 16:58	1
Sulfate	5.9	M	1.0	0.40	mg/L			06/01/20 16:58	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	680		50	17	ug/L		05/27/20 10:57	05/28/20 15:03	1
Manganese	4700		10	1.0	ug/L		05/27/20 10:57	05/28/20 15:03	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.0	U	3.0	1.5	ug/L		05/27/20 10:57	05/28/20 14:36	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	110		10	3.1	mg/L			05/28/20 14:20	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.2	B	1.0	0.35	mg/L			06/04/20 21:51	1

Client Sample ID: SHL-4-SPR20

Lab Sample ID: 680-184098-5

Date Collected: 05/20/20 09:40
Date Received: 05/21/20 09:15
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			06/01/20 17:10	1
Sulfate	27		1.0	0.40	mg/L			06/01/20 17:10	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	24000		50	17	ug/L		05/27/20 10:57	05/28/20 14:49	1
Manganese	2500		10	1.0	ug/L		05/27/20 10:57	05/28/20 14:49	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	220		3.0	1.5	ug/L		05/27/20 10:57	05/28/20 14:25	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	100		10	3.1	mg/L			05/28/20 14:24	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.3	B	1.0	0.35	mg/L			06/04/20 22:42	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

Client Sample ID: SHL-DUP03-SPR20

Lab Sample ID: 680-184098-6
Date Collected: 05/20/20 11:30
Matrix: Water
Date Received: 05/21/20 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	50		0.50	0.20	mg/L			06/01/20 17:48	1
Sulfate	4.8		1.0	0.40	mg/L			06/01/20 17:48	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	79000		50	17	ug/L		05/27/20 10:57	05/28/20 15:07	1
Manganese	2000		10	1.0	ug/L		05/27/20 10:57	05/28/20 15:07	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		05/27/20 10:57	05/28/20 14:39	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	200		10	3.1	mg/L			05/28/20 14:30	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			06/04/20 23:29	1

Client Sample ID: SHM-11-06-SPR20

Lab Sample ID: 680-184098-7
Date Collected: 05/20/20 11:30
Matrix: Water
Date Received: 05/21/20 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	50		0.50	0.20	mg/L			06/01/20 18:26	1
Sulfate	4.7	M	1.0	0.40	mg/L			06/01/20 18:26	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	77000		50	17	ug/L		05/27/20 10:57	05/28/20 14:41	1
Manganese	2000		10	1.0	ug/L		05/27/20 10:57	05/28/20 14:41	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	750		3.0	1.5	ug/L		05/27/20 10:57	05/28/20 14:15	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	220		10	3.1	mg/L			05/28/20 14:36	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			06/04/20 23:45	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

Client Sample ID: SHM-13-04-SPR20

Lab Sample ID: 680-184098-8
Date Collected: 05/20/20 15:35
Matrix: Water
Date Received: 05/21/20 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	160		0.50	0.20	mg/L			06/02/20 00:59	1
Sulfate	8.0		1.0	0.40	mg/L			06/02/20 00:59	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	1300		50	17	ug/L		05/27/20 10:57	05/28/20 14:04	1
Manganese	100		10	1.0	ug/L		05/27/20 10:57	05/28/20 14:04	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	200		3.0	1.5	ug/L		05/27/20 10:57	05/28/20 13:53	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	44		10	3.1	mg/L			05/28/20 14:40	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			06/05/20 00:00	1

Client Sample ID: SHP-01-36X-SPR20

Lab Sample ID: 680-184098-9
Date Collected: 05/20/20 13:00
Matrix: Water
Date Received: 05/21/20 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	62		0.50	0.20	mg/L			06/02/20 01:11	1
Sulfate	5.6		1.0	0.40	mg/L			06/02/20 01:11	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	760		50	17	ug/L		05/27/20 10:57	05/28/20 14:27	1
Manganese	32		10	1.0	ug/L		05/27/20 10:57	05/28/20 14:27	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.9		3.0	1.5	ug/L		05/27/20 10:57	05/28/20 14:11	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	33		10	3.1	mg/L			05/28/20 14:44	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			06/05/20 00:19	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

Client Sample ID: SHP-01-37X-SPR20

Lab Sample ID: 680-184098-10
Date Collected: 05/20/20 11:10
Matrix: Water
Date Received: 05/21/20 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	68		0.50	0.20	mg/L			06/02/20 01:24	1
Sulfate	6.6		1.0	0.40	mg/L			06/02/20 01:24	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	1500		50	17	ug/L		05/27/20 10:57	05/28/20 14:58	1
Manganese	150		10	1.0	ug/L		05/27/20 10:57	05/28/20 14:58	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		05/27/20 10:57	05/28/20 14:32	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	37		10	3.1	mg/L			05/28/20 14:48	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			06/05/20 00:36	1

Client Sample ID: SHP-2016-07A-SPR20

Lab Sample ID: 680-184098-11
Date Collected: 05/20/20 13:45
Matrix: Water
Date Received: 05/21/20 09:15

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			06/02/20 01:37	1
Sulfate	2.9		1.0	0.40	mg/L			06/02/20 01:37	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	5600		50	17	ug/L		05/27/20 10:57	05/28/20 14:22	1
Manganese	4100		10	1.0	ug/L		05/27/20 10:57	05/28/20 14:22	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	74		3.0	1.5	ug/L		05/27/20 10:57	05/28/20 14:07	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	34		10	3.1	mg/L			05/28/20 14:52	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			06/05/20 00:50	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

Client Sample ID: SHP-2016-2A-SPR20

Lab Sample ID: 680-184098-12
Date Collected: 05/20/20 10:40
Matrix: Water
Date Received: 05/21/20 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.1		0.50	0.20	mg/L			06/02/20 01:49	1
Sulfate	3.8		1.0	0.40	mg/L			06/02/20 01:49	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	32	J	50	17	ug/L		05/27/20 10:57	05/28/20 14:53	1
Manganese	290		10	1.0	ug/L		05/27/20 10:57	05/28/20 14:53	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	9.5		3.0	1.5	ug/L		05/27/20 10:57	05/28/20 14:29	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	58		10	3.1	mg/L			05/28/20 14:56	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	0.66	J	1.0	0.35	mg/L			06/05/20 01:07	1

Client Sample ID: SHP-2016-2B-SPR20

Lab Sample ID: 680-184098-13
Date Collected: 05/20/20 09:20
Matrix: Water
Date Received: 05/21/20 09:15

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.7		0.50	0.20	mg/L			06/02/20 02:02	1
Sulfate	2.3		1.0	0.40	mg/L			06/02/20 02:02	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	31000		50	17	ug/L		05/27/20 10:57	05/28/20 14:17	1
Manganese	1900		10	1.0	ug/L		05/27/20 10:57	05/28/20 14:17	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	260		3.0	1.5	ug/L		05/27/20 10:57	05/28/20 14:04	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	120		10	3.1	mg/L			05/28/20 15:22	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			06/05/20 01:26	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

Client Sample ID: SHP-2016-3A-SPR20

Lab Sample ID: 680-184098-14

Date Collected: 05/20/20 15:25
Date Received: 05/21/20 09:15

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.9		0.50	0.20	mg/L			06/02/20 02:15	1
Sulfate	2.2		1.0	0.40	mg/L			06/02/20 02:15	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	7400		50	17	ug/L		05/27/20 10:57	05/28/20 14:08	1
Manganese	380		10	1.0	ug/L		05/27/20 10:57	05/28/20 14:08	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.1		3.0	1.5	ug/L		05/27/20 10:57	05/28/20 13:57	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	37		10	3.1	mg/L			05/28/20 15:31	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	0.90	J	1.0	0.35	mg/L			06/05/20 03:01	1

Client Sample ID: SHP-2016-3B-SPR20

Lab Sample ID: 680-184098-15

Date Collected: 05/20/20 13:50
Date Received: 05/21/20 09:15

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			06/02/20 02:27	1
Sulfate	2.4		1.0	0.40	mg/L			06/02/20 02:27	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	25000		50	17	ug/L		05/27/20 10:57	05/28/20 14:13	1
Manganese	2000		10	1.0	ug/L		05/27/20 10:57	05/28/20 14:13	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		05/27/20 10:57	05/28/20 14:00	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	100		10	3.1	mg/L			05/28/20 15:36	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			06/05/20 03:20	1

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 680-620645/2 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620645

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.50	U	0.50	0.20	mg/L			06/01/20 09:57	1
Sulfate	1.0	U M	1.0	0.40	mg/L			06/01/20 09:57	1

Lab Sample ID: LCS 680-620645/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620645

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	10.4		mg/L		104	87 - 112

Lab Sample ID: LCSD 680-620645/4 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620645

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.95		mg/L		99	87 - 111	0	15
Sulfate	10.0	10.4		mg/L		104	87 - 112	0	15

Lab Sample ID: 680-184098-6 MS — **Client Sample ID: SHL-DUP03-SPR20**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620645

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50		10.0	59.7	4	mg/L		99	87 - 111
Sulfate	4.8		10.0	14.7		mg/L		99	87 - 112

Lab Sample ID: 680-184098-6 MSD — **Client Sample ID: SHL-DUP03-SPR20**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620645

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	50		10.0	59.6	4	mg/L		98	87 - 111	0	15
Sulfate	4.8		10.0	14.8		mg/L		100	87 - 112	1	15

Lab Sample ID: MB 680-620755/33 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620755

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.50	U	0.50	0.20	mg/L			06/01/20 20:33	1
Sulfate	1.0	U	1.0	0.40	mg/L			06/01/20 20:33	1

Lab Sample ID: LCS 680-620755/34 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620755

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.89		mg/L		99	87 - 111
Sulfate	10.0	9.54		mg/L		95	87 - 112

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: LCSD 680-620755/35
Matrix: Water
Analysis Batch: 620755

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	9.92		mg/L		99	87 - 111	0	15
Sulfate	10.0	9.58		mg/L		96	87 - 112	1	15

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-620068/1-A
Matrix: Water
Analysis Batch: 620390

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 620068

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	50	U	50	17	ug/L		05/27/20 10:57	05/28/20 13:15	1
Manganese	3.0	U	10	1.0	ug/L		05/27/20 10:57	05/28/20 13:15	1

Lab Sample ID: LCS 680-620068/2-A
Matrix: Water
Analysis Batch: 620390

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 620068

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5010	5070		ug/L		101	87 - 115
Manganese	400	416		ug/L		104	90 - 114

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-620067/1-A
Matrix: Water
Analysis Batch: 620379

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 620067

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.0	U	3.0	1.5	ug/L		05/27/20 10:57	05/28/20 13:00	1

Lab Sample ID: LCS 680-620067/2-A
Matrix: Water
Analysis Batch: 620379

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 620067

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	109		ug/L		109	84 - 116

Method: 9060A - Organic Carbon, Dissolved (DOC)

Lab Sample ID: MB 280-497612/21
Matrix: Water
Analysis Batch: 497612

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.0	U	1.0	0.35	mg/L			06/04/20 21:18	1

Method: 9060A - Organic Carbon, Dissolved (DOC) (Continued)

Lab Sample ID: LCS 280-497612/20 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Dissolved Organic Carbon			25.0	25.4		mg/L		101	88 - 112		

Lab Sample ID: 680-184098-4 MS — **Client Sample ID: EPA-PZ-2012-2B-SPR20**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Dissolved Organic Carbon	1.2	B	25.0	27.5		mg/L		105	88 - 112		

Lab Sample ID: 680-184098-4 MSD — **Client Sample ID: EPA-PZ-2012-2B-SPR20**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Organic Carbon	1.2	B	25.0	27.1		mg/L		104	88 - 112	1	15

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 280-496617/31 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 496617

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	10	U	10	3.1	mg/L			05/28/20 12:57	1

Lab Sample ID: MB 280-496617/58 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 496617

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	10	U	10	3.1	mg/L			05/28/20 15:17	1

Lab Sample ID: LCS 280-496617/30 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 496617

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Alkalinity			200	203		mg/L		102	89 - 109		

Lab Sample ID: LCS 280-496617/57 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 496617

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Alkalinity			200	205		mg/L		102	89 - 109		

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: 680-184098-13 DU
Matrix: Water
Analysis Batch: 496617

Client Sample ID: SHP-2016-2B-SPR20
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity	120			120		mg/L				0.4	10

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

HPLC/IC

Analysis Batch: 620645

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184098-4	EPA-PZ-2012-2B-SPR20	Total/NA	Water	9056A	
680-184098-5	SHL-4-SPR20	Total/NA	Water	9056A	
680-184098-6	SHL-DUP03-SPR20	Total/NA	Water	9056A	
680-184098-7	SHM-11-06-SPR20	Total/NA	Water	9056A	
MB 680-620645/2	Method Blank	Total/NA	Water	9056A	
LCS 680-620645/3	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-620645/4	Lab Control Sample Dup	Total/NA	Water	9056A	
680-184098-6 MS	SHL-DUP03-SPR20	Total/NA	Water	9056A	
680-184098-6 MSD	SHL-DUP03-SPR20	Total/NA	Water	9056A	

Analysis Batch: 620755

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184098-8	SHM-13-04-SPR20	Total/NA	Water	9056A	
680-184098-9	SHP-01-36X-SPR20	Total/NA	Water	9056A	
680-184098-10	SHP-01-37X-SPR20	Total/NA	Water	9056A	
680-184098-11	SHP-2016-07A-SPR20	Total/NA	Water	9056A	
680-184098-12	SHP-2016-2A-SPR20	Total/NA	Water	9056A	
680-184098-13	SHP-2016-2B-SPR20	Total/NA	Water	9056A	
680-184098-14	SHP-2016-3A-SPR20	Total/NA	Water	9056A	
680-184098-15	SHP-2016-3B-SPR20	Total/NA	Water	9056A	
MB 680-620755/33	Method Blank	Total/NA	Water	9056A	
LCS 680-620755/34	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-620755/35	Lab Control Sample Dup	Total/NA	Water	9056A	

Metals

Prep Batch: 620067

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184098-4	EPA-PZ-2012-2B-SPR20	Dissolved	Water	3005A	
680-184098-5	SHL-4-SPR20	Dissolved	Water	3005A	
680-184098-6	SHL-DUP03-SPR20	Dissolved	Water	3005A	
680-184098-7	SHM-11-06-SPR20	Dissolved	Water	3005A	
680-184098-8	SHM-13-04-SPR20	Dissolved	Water	3005A	
680-184098-9	SHP-01-36X-SPR20	Dissolved	Water	3005A	
680-184098-10	SHP-01-37X-SPR20	Dissolved	Water	3005A	
680-184098-11	SHP-2016-07A-SPR20	Dissolved	Water	3005A	
680-184098-12	SHP-2016-2A-SPR20	Dissolved	Water	3005A	
680-184098-13	SHP-2016-2B-SPR20	Dissolved	Water	3005A	
680-184098-14	SHP-2016-3A-SPR20	Dissolved	Water	3005A	
680-184098-15	SHP-2016-3B-SPR20	Dissolved	Water	3005A	
MB 680-620067/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-620067/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 620068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184098-4	EPA-PZ-2012-2B-SPR20	Dissolved	Water	3005A	
680-184098-5	SHL-4-SPR20	Dissolved	Water	3005A	
680-184098-6	SHL-DUP03-SPR20	Dissolved	Water	3005A	
680-184098-7	SHM-11-06-SPR20	Dissolved	Water	3005A	
680-184098-8	SHM-13-04-SPR20	Dissolved	Water	3005A	
680-184098-9	SHP-01-36X-SPR20	Dissolved	Water	3005A	

Metals (Continued)

Prep Batch: 620068 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184098-10	SHP-01-37X-SPR20	Dissolved	Water	3005A	
680-184098-11	SHP-2016-07A-SPR20	Dissolved	Water	3005A	
680-184098-12	SHP-2016-2A-SPR20	Dissolved	Water	3005A	
680-184098-13	SHP-2016-2B-SPR20	Dissolved	Water	3005A	
680-184098-14	SHP-2016-3A-SPR20	Dissolved	Water	3005A	
680-184098-15	SHP-2016-3B-SPR20	Dissolved	Water	3005A	
MB 680-620068/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-620068/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 620379

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184098-4	EPA-PZ-2012-2B-SPR20	Dissolved	Water	6020A	620067
680-184098-5	SHL-4-SPR20	Dissolved	Water	6020A	620067
680-184098-6	SHL-DUP03-SPR20	Dissolved	Water	6020A	620067
680-184098-7	SHM-11-06-SPR20	Dissolved	Water	6020A	620067
680-184098-8	SHM-13-04-SPR20	Dissolved	Water	6020A	620067
680-184098-9	SHP-01-36X-SPR20	Dissolved	Water	6020A	620067
680-184098-10	SHP-01-37X-SPR20	Dissolved	Water	6020A	620067
680-184098-11	SHP-2016-07A-SPR20	Dissolved	Water	6020A	620067
680-184098-12	SHP-2016-2A-SPR20	Dissolved	Water	6020A	620067
680-184098-13	SHP-2016-2B-SPR20	Dissolved	Water	6020A	620067
680-184098-14	SHP-2016-3A-SPR20	Dissolved	Water	6020A	620067
680-184098-15	SHP-2016-3B-SPR20	Dissolved	Water	6020A	620067
MB 680-620067/1-A	Method Blank	Total Recoverable	Water	6020A	620067
LCS 680-620067/2-A	Lab Control Sample	Total Recoverable	Water	6020A	620067

Analysis Batch: 620390

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184098-4	EPA-PZ-2012-2B-SPR20	Dissolved	Water	6010C	620068
680-184098-5	SHL-4-SPR20	Dissolved	Water	6010C	620068
680-184098-6	SHL-DUP03-SPR20	Dissolved	Water	6010C	620068
680-184098-7	SHM-11-06-SPR20	Dissolved	Water	6010C	620068
680-184098-8	SHM-13-04-SPR20	Dissolved	Water	6010C	620068
680-184098-9	SHP-01-36X-SPR20	Dissolved	Water	6010C	620068
680-184098-10	SHP-01-37X-SPR20	Dissolved	Water	6010C	620068
680-184098-11	SHP-2016-07A-SPR20	Dissolved	Water	6010C	620068
680-184098-12	SHP-2016-2A-SPR20	Dissolved	Water	6010C	620068
680-184098-13	SHP-2016-2B-SPR20	Dissolved	Water	6010C	620068
680-184098-14	SHP-2016-3A-SPR20	Dissolved	Water	6010C	620068
680-184098-15	SHP-2016-3B-SPR20	Dissolved	Water	6010C	620068
MB 680-620068/1-A	Method Blank	Total Recoverable	Water	6010C	620068
LCS 680-620068/2-A	Lab Control Sample	Total Recoverable	Water	6010C	620068

General Chemistry

Analysis Batch: 496617

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184098-4	EPA-PZ-2012-2B-SPR20	Total/NA	Water	SM 2320B	
680-184098-5	SHL-4-SPR20	Total/NA	Water	SM 2320B	
680-184098-6	SHL-DUP03-SPR20	Total/NA	Water	SM 2320B	
680-184098-7	SHM-11-06-SPR20	Total/NA	Water	SM 2320B	

General Chemistry (Continued)

Analysis Batch: 496617 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184098-8	SHM-13-04-SPR20	Total/NA	Water	SM 2320B	
680-184098-9	SHP-01-36X-SPR20	Total/NA	Water	SM 2320B	
680-184098-10	SHP-01-37X-SPR20	Total/NA	Water	SM 2320B	
680-184098-11	SHP-2016-07A-SPR20	Total/NA	Water	SM 2320B	
680-184098-12	SHP-2016-2A-SPR20	Total/NA	Water	SM 2320B	
680-184098-13	SHP-2016-2B-SPR20	Total/NA	Water	SM 2320B	
680-184098-14	SHP-2016-3A-SPR20	Total/NA	Water	SM 2320B	
680-184098-15	SHP-2016-3B-SPR20	Total/NA	Water	SM 2320B	
MB 280-496617/31	Method Blank	Total/NA	Water	SM 2320B	
MB 280-496617/58	Method Blank	Total/NA	Water	SM 2320B	
LCS 280-496617/30	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 280-496617/57	Lab Control Sample	Total/NA	Water	SM 2320B	
680-184098-13 DU	SHP-2016-2B-SPR20	Total/NA	Water	SM 2320B	

Analysis Batch: 497612

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184098-4	EPA-PZ-2012-2B-SPR20	Dissolved	Water	9060A	
680-184098-5	SHL-4-SPR20	Dissolved	Water	9060A	
680-184098-6	SHL-DUP03-SPR20	Dissolved	Water	9060A	
680-184098-7	SHM-11-06-SPR20	Dissolved	Water	9060A	
680-184098-8	SHM-13-04-SPR20	Dissolved	Water	9060A	
680-184098-9	SHP-01-36X-SPR20	Dissolved	Water	9060A	
680-184098-10	SHP-01-37X-SPR20	Dissolved	Water	9060A	
680-184098-11	SHP-2016-07A-SPR20	Dissolved	Water	9060A	
680-184098-12	SHP-2016-2A-SPR20	Dissolved	Water	9060A	
680-184098-13	SHP-2016-2B-SPR20	Dissolved	Water	9060A	
680-184098-14	SHP-2016-3A-SPR20	Dissolved	Water	9060A	
680-184098-15	SHP-2016-3B-SPR20	Dissolved	Water	9060A	
MB 280-497612/21	Method Blank	Dissolved	Water	9060A	
LCS 280-497612/20	Lab Control Sample	Dissolved	Water	9060A	
680-184098-4 MS	EPA-PZ-2012-2B-SPR20	Dissolved	Water	9060A	
680-184098-4 MSD	EPA-PZ-2012-2B-SPR20	Dissolved	Water	9060A	

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

Client Sample ID: EPA-PZ-2012-2B-SPR20

Lab Sample ID: 680-184098-4
Date Collected: 05/20/20 09:05
Matrix: Water
Date Received: 05/21/20 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	620645	06/01/20 16:58	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620068	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620390	05/28/20 15:03	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620067	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620379	05/28/20 14:36	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/04/20 21:51	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496617	05/28/20 14:20	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHL-4-SPR20

Lab Sample ID: 680-184098-5
Date Collected: 05/20/20 09:40
Matrix: Water
Date Received: 05/21/20 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	620645	06/01/20 17:10	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620068	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620390	05/28/20 14:49	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620067	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620379	05/28/20 14:25	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/04/20 22:42	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496617	05/28/20 14:24	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHL-DUP03-SPR20

Lab Sample ID: 680-184098-6
Date Collected: 05/20/20 11:30
Matrix: Water
Date Received: 05/21/20 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	620645	06/01/20 17:48	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620068	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620390	05/28/20 15:07	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620067	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620379	05/28/20 14:39	BJB	TAL SAV
	Instrument ID: ICPMSD									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

Client Sample ID: SHL-DUP03-SPR20

Lab Sample ID: 680-184098-6
Date Collected: 05/20/20 11:30
Matrix: Water
Date Received: 05/21/20 09:15

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	497612	06/04/20 23:29	JMB	TAL DEN
Total/NA	Analysis	SM 2320B		1			496617	05/28/20 14:30	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHM-11-06-SPR20

Lab Sample ID: 680-184098-7
Date Collected: 05/20/20 11:30
Matrix: Water
Date Received: 05/21/20 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	620645	06/01/20 18:26	UI	TAL SAV
	Instrument ID:	CICK								
Dissolved	Prep	3005A			50 mL	50 mL	620068	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620390	05/28/20 14:41	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620067	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620379	05/28/20 14:15	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/04/20 23:45	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496617	05/28/20 14:36	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHM-13-04-SPR20

Lab Sample ID: 680-184098-8
Date Collected: 05/20/20 15:35
Matrix: Water
Date Received: 05/21/20 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	620755	06/02/20 00:59	UI	TAL SAV
	Instrument ID:	CICK								
Dissolved	Prep	3005A			50 mL	50 mL	620068	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620390	05/28/20 14:04	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620067	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620379	05/28/20 13:53	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 00:00	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496617	05/28/20 14:40	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

Client Sample ID: SHP-01-36X-SPR20

Lab Sample ID: 680-184098-9
Date Collected: 05/20/20 13:00
Matrix: Water
Date Received: 05/21/20 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	620755	06/02/20 01:11	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620068	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620390	05/28/20 14:27	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620067	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620379	05/28/20 14:11	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 00:19	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496617	05/28/20 14:44	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHP-01-37X-SPR20

Lab Sample ID: 680-184098-10
Date Collected: 05/20/20 11:10
Matrix: Water
Date Received: 05/21/20 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	620755	06/02/20 01:24	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620068	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620390	05/28/20 14:58	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620067	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620379	05/28/20 14:32	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 00:36	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496617	05/28/20 14:48	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHP-2016-07A-SPR20

Lab Sample ID: 680-184098-11
Date Collected: 05/20/20 13:45
Matrix: Water
Date Received: 05/21/20 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	620755	06/02/20 01:37	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620068	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620390	05/28/20 14:22	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620067	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620379	05/28/20 14:07	BJB	TAL SAV
	Instrument ID: ICPMSD									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

Client Sample ID: SHP-2016-07A-SPR20

Lab Sample ID: 680-184098-11
Date Collected: 05/20/20 13:45
Matrix: Water
Date Received: 05/21/20 09:15

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	497612	06/05/20 00:50	JMB	TAL DEN
Total/NA	Analysis	SM 2320B		1			496617	05/28/20 14:52	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHP-2016-2A-SPR20

Lab Sample ID: 680-184098-12
Date Collected: 05/20/20 10:40
Matrix: Water
Date Received: 05/21/20 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	620755	06/02/20 01:49	UI	TAL SAV
	Instrument ID:	CICK								
Dissolved	Prep	3005A			50 mL	50 mL	620068	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620390	05/28/20 14:53	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620067	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620379	05/28/20 14:29	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 01:07	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496617	05/28/20 14:56	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHP-2016-2B-SPR20

Lab Sample ID: 680-184098-13
Date Collected: 05/20/20 09:20
Matrix: Water
Date Received: 05/21/20 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	620755	06/02/20 02:02	UI	TAL SAV
	Instrument ID:	CICK								
Dissolved	Prep	3005A			50 mL	50 mL	620068	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620390	05/28/20 14:17	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620067	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620379	05/28/20 14:04	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 01:26	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496617	05/28/20 15:22	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

Client Sample ID: SHP-2016-3A-SPR20

Lab Sample ID: 680-184098-14

Date Collected: 05/20/20 15:25
Date Received: 05/21/20 09:15

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	620755	06/02/20 02:15	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620068	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620390	05/28/20 14:08	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620067	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620379	05/28/20 13:57	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 03:01	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496617	05/28/20 15:31	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHP-2016-3B-SPR20

Lab Sample ID: 680-184098-15

Date Collected: 05/20/20 13:50
Date Received: 05/21/20 09:15

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	620755	06/02/20 02:27	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620068	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620390	05/28/20 14:13	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620067	05/27/20 10:57	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620379	05/28/20 14:00	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 03:20	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496617	05/28/20 15:36	SPG	TAL DEN
	Instrument ID: WC-AT3									

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: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

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: JV, LTM - SHL Spring 2020

Job ID: 680-184098-1

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
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-1A	N1	23.70	28.70		
2	EPA-PZ-2012-1B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-1B	N1	73.56	78.56		
3	EPA-PZ-2012-2A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-2A	N1	18.14	23.14		
4	EPA-PZ-2012-2B-SPR20	WG	5-20-20	0905	GO	X	X	X	X	X	EPA-PZ-2012-2B	N1	73.16	78.16		
5	EPA-PZ-2012-3A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-3A	N1	19.09	24.09		
6	EPA-PZ-2012-3B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-3B	N1	68.70	73.70		
7	EPA-PZ-2012-4A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-4A	N1	19.56	24.56		
8	EPA-PZ-2012-4B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-4B	N1	79.50	84.50		
9	EPA-PZ-2012-5A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-5A	N1	17.95	22.95		
10	EPA-PZ-2012-5B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-5B	N1	68.46	73.46		
11	EPA-PZ-2012-6A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-6A	N1	24.19	29.19		
12	EPA-PZ-2012-6B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-6B	N1	74.23	79.23		
13	EPA-PZ-2012-7A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-7A	N1	23.87	28.87		
14	EPA-PZ-2012-7B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-7B	N1	58.82	63.82		
15	EW-01-SPR20	WG				X	X	X	X	X	EW-01	N1	60.00	85.00		
16	EW-04-SPR20	WG				X	X	X	X	X	EW-04	N1	70.00	95.00		
17	PZ-12-01-SPR20	WG				X	X	X	X	X	PZ-12-01	N1	24.00	34.00		
18	PZ-12-02-SPR20	WG				X	X	X	X	X	PZ-12-02	N1	24.00	34.00		

Relinquished by: *(Signature)*
Date 5/20/20
Time 1655
Received by: *(Signature)*
Devens eCOCs Spring 2020

Date 5/20/20
Time 17:00
Shipping Date:
Received by Laboratory: ***(Signature, Date, Time)*** & conditio

5/21/2020 0915
2.1/2.5 1.8/2.2

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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-12-03-SPR20	WG				X	X	X	X	X	PZ-12-03	N1	24.00	34.00		
20	PZ-12-04-SPR20	WG				X	X	X	X	X	PZ-12-04	N1	24.00	34.00		
21	PZ-12-05-SPR20	WG				X	X	X	X	X	PZ-12-05	N1	26.00	36.00		
22	PZ-12-06-SPR20	WG				X	X	X	X	X	PZ-12-06	N1	25.00	35.00		
23	PZ-12-07-SPR20	WG				X	X	X	X	X	PZ-12-07	N1	20.00	30.00		
24	PZ-12-08-SPR20	WG				X	X	X	X	X	PZ-12-08	N1	22.00	32.00		
25	PZ-12-09-SPR20	WG				X	X	X	X	X	PZ-12-09	MS1	20.00	30.00		
26	PZ-12-09-SPR20	WG				X	X	X	X	X	PZ-12-09	N1	20.00	30.00		
27	PZ-12-09-SPR20	WG				X	X	X	X	X	PZ-12-09	SD1	20.00	30.00		
28	PZ-12-10-SPR20	WG				X	X	X	X	X	PZ-12-10	N1	20.00	30.00		
29	SHL-10-SPR20	WG				X	X	X	X	X	SHL-10	N1	24.00	39.00		
30	SHL-11-SPR20	WG				X	X	X	X	X	SHL-11	N1	12.00	27.00		
31	SHL-19-SPR20	WG				X	X	X	X	X	SHL-19	N1	20.00	30.00		
32	SHL-20-SPR20	WG				X	X	X	X	X	SHL-20	N1	39.00	49.00		
33	SHL-4-SPR20	WG	5-20-20	940	DC	X	X	X	X	X	SHL-4	N1	3.00	13.00		
34	SHL-DUP01-SPR20	WG				X	X	X	X	X	PZ-12-06	FD1	25.00	35.00		
35	SHL-DUP02-SPR20	WG				X	X	X	X	X	SHL-20	FD1	39.00	49.00		
36	SHL-DUP03-SPR20	WG	5-20-20	1130	DC	X	X	X	X	X	SHM-11-06	FD1	25.00	35.00		

Relinquished by: *(Signature)*
Date
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Received by: *(Signature)*
Devens aCOCs Spring 2020

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5/21/2020 09:15

2.1/25
1.8/2.2

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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

					Analytical Test Method	A2320B (A)	SW6010C/FLDFLT (B)	SW6020A/FLDFLT (B)	SW9056A (A)	SW9060A/FLDFLT (B)											
	Event: JV, Long Term Monitoring, SHL, Spring 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
37	SHL-DUP04-SPR20	WG				X	X	X	X	X						SHP-01-38A	FD1	1.50	6.50		
38	SHL-DUP05-SPR20	WG				X	X	X	X	X						EPA-PZ-2012-4B	FD1	79.50	84.50		
39	SHL-DUP06-SPR20	WG				X	X	X	X	X						SHM-05-40X	FD1	32.00	34.00		
40	SHM-05-40X-SPR20	WG				X	X	X	X	X						SHM-05-40X	N1	32.00	34.00		
41	SHM-05-41B-SPR20	WG				X	X	X	X	X						SHM-05-41B	N1	62.00	64.00		
42	SHM-05-41C-SPR20	WG				X	X	X	X	X						SHM-05-41C	MS1	88.00	93.00		
43	SHM-05-41C-SPR20	WG				X	X	X	X	X						SHM-05-41C	N1	88.00	93.00		
44	SHM-05-41C-SPR20	WG				X	X	X	X	X						SHM-05-41C	SD1	88.00	93.00		
45	SHM-07-03-SPR20	WG				X	X	X	X	X						SHM-07-03	N1	25.00	35.00		
46	SHM-07-05X-SPR20	WG				X	X	X	X	X						SHM-07-05X	N1	55.00	65.00		
47	SHM-11-02-SPR20	WG				X	X	X	X	X						SHM-11-02	N1	52.00	66.00		
48	SHM-11-06-SPR20	WG	5-20-20	1130	DC	X	X	X	X	X						SHM-11-06	N1	25.00	35.00		
49	SHM-13-03-SPR20	WG				X	X	X	X	X						SHM-13-03	N1	42.00	52.00		
50	SHM-13-04-SPR20	WG				X	X	X	X	X						SHM-13-04	MS1	20.00	30.00		
51	SHM-13-04-SPR20	WG				X	X	X	X	X						SHM-13-04	N1	20.00	30.00		
52	SHM-13-04-SPR20	WG	5-20-20	1535	GO	X	X	X	X	X						SHM-13-04	SD1	20.00	30.00		
53	SHM-13-06-SPR20	WG				X	X	X	X	X						SHM-13-06	N1	36.00	46.00		
54	SHM-13-07-SPR20	WG				X	X	X	X	X						SHM-13-07	N1	27.00	37.00		

Relinquished by: *(Signature)*
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Devens eCOCs Spring 2020

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5/21/2020 0915 2.1/2.5 1.8/2.2

CHAIN-OF-CUSTODY RECORD

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Corey Caulkins
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COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
A2320B (A) = Alkalinity
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WG	Ground Water

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3	1x 250mL, amber glass, H2SO4, pH < 2; Cool < 6degC
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46	1x 250mL, plastic, Cool < 6degC

Boston #215

Event: JV, Long Term Monitoring, SHL, Spring 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						
55	SHM-13-08-SPR20	WG				X	X	X	X	X	SHM-13-08	N1	55.00	65.00		
56	SHM-93-22B-SPR20	WG				X	X	X	X	X	SHM-93-22B	N1	82.30	92.30		
57	SHM-96-5B-SPR20	WG				X	X	X	X	X	SHM-96-5B	N1	80.00	90.00		
58	SHP-01-36X-SPR20	WG	5-20-20	1300	GO	X	X	X	X	X	SHP-01-36X	N1	3.00	8.00		
59	SHP-01-37X-SPR20	WG	5-20-20	1110	GO	X	X	X	X	X	SHP-01-37X	N1	1.00	6.00		
60	SHP-01-38A-SPR20	WG				X	X	X	X	X	SHP-01-38A	N1	1.50	6.50		
61	SHP-2016-06A-SPR20	WG				X	X	X	X	X	SHP-2016-06A	N1	81.00	86.00		
62	SHP-2016-06B-SPR20	WG				X	X	X	X	X	SHP-2016-06B	N1	102.00	112.00		
63	SHP-2016-06C-SPR20	WG				X	X	X	X	X	SHP-2016-06C	N1	123.00	133.00		
64	SHP-2016-07A-SPR20	WG	5-20-20	1345	DC	X	X	X	X	X	SHP-2016-07A	N1	22.00	32.00		
65	SHP-2016-07B-SPR20	WG				X	X	X	X	X	SHP-2016-07B	N1	70.00	80.00		
66	SHP-2016-1A-SPR20	WG				X	X	X	X	X	SHP-2016-1A	N1	13.00	23.00		
67	SHP-2016-1B-SPR20	WG				X	X	X	X	X	SHP-2016-1B	N1	75.00	85.00		
68	SHP-2016-2A-SPR20	WG	5-20-20	1040	DB	X	X	X	X	X	SHP-2016-2A	N1	20.00	25.00		
69	SHP-2016-2B-SPR20	WG	5-20-20	0920	DB	X	X	X	X	X	SHP-2016-2B	N1	80.00	85.00		
70	SHP-2016-3A-SPR20	WG	5-20-20	1525	DB	X	X	X	X	X	SHP-2016-3A	N1	20.00	25.00		
71	SHP-2016-3B-SPR20	WG	5-20-20	1350	DB	X	X	X	X	X	SHP-2016-3B	N1	80.00	85.00		
72	~~SHP-2016-4A-SPR20~~	~~WG~~	~~5-20-20~~	~~1540~~	~~DC~~	X	X	X	X	X	SHP-2016-4A	N1	25.00	30.00	Not Sampled DC	

Relinquished by: *(Signature)*
Date 5/20/20
Time 1651
Received by: *(Signature)*
Devens eCOCs Spring 2020

Date 5/20/20
Time 17:00
Shipping Date:
Received by Laboratory: ***(Signature, Date, Time)*** & conditio 5/21/2020 0915 2.1/2.5 1.8/2.2

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
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United States

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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WG	Ground Water

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Boston #215

	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: JV, Long Term Monitoring, SHL, Spring 2020				Analytical Test Method	46	9	9	5	3											
73	SHP-2016-4B-SPR20	WG				X	X	X	X	X						SHP-2016-4B	N1	85.00	90.00		
74	SHP-2016-5A-SPR20	WG				X	X	X	X	X						SHP-2016-5A	N1	25.00	30.00		
75	SHP-2016-5B-SPR20	WG				X	X	X	X	X						SHP-2016-5B	N1	85.00	90.00		

Turnaround Time: NA

Relinquished by: *(Signature)*
Date 5/20/20
Time 1635
Received by: *(Signature)*
Devens eCOCs Spring 2020

Date 5/20/20
Time 17:00
Shipping Date:
Received by Laboratory: ***(Signature, Date, Time)*** & conditio 5/21/2020 0915 2.1/2.5 1.8/2.2

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: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-611903.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Massachusetts	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD - A2LA; DoD ELAP - A2LA		Job #: 680-184098-1
Address: 4955 Yarrow Street,	Due Date Requested: 6/2/2020			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: JV/ LTM - SHL Spring 2020	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)	9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC)	2320B/ Alkalinity	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
EPA-PZ-2012-2B-SPR20 (680-184098-4)	5/20/20	09:05 Eastern		Water			X	X	2	
SHL-4-SPR20 (680-184098-5)	5/20/20	09:40 Eastern		Water			X	X	2	
SHL-DUP03-SPR20 (680-184098-6)	5/20/20	11:30 Eastern		Water			X	X	2	
SHM-11-06-SPR20 (680-184098-7)	5/20/20	11:30 Eastern		Water			X	X	2	
SHM-13-04-SPR20 (680-184098-8)	5/20/20	15:35 Eastern		Water			X	X	2	
SHP-01-36X-SPR20 (680-184098-9)	5/20/20	13:00 Eastern		Water			X	X	2	
SHP-01-37X-SPR20 (680-184098-10)	5/20/20	11:10 Eastern		Water			X	X	2	
SHP-2016-07A-SPR20 (680-184098-11)	5/20/20	13:45 Eastern		Water			X	X	2	
SHP-2016-2A-SPR20 (680-184098-12)	5/20/20	10:40 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: 5-21-20 1630	Company: TA	Received by:	Date/Time: 5/22/20 0920	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.: 1167075		Cooler Temperature(s) °C and Other Remarks: 5.4, IR8, +0.6, DS, 5/22/20		

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: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-611903.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Massachusetts	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): DoD - A2LA; DoD ELAP - A2LA		Job #: 680-184098-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 6/2/2020			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: JV/ LTM - SHL Spring 2020	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)	9060A_Diss/FIELD_FLTRD Organic Carbon, Dissolved (DOC)	2320B/ Alkalinity	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
SHP-2016-2B-SPR20 (680-184098-13)	5/20/20	09:20 Eastern		Water			X	X	2	
SHP-2016-3A-SPR20 (680-184098-14)	5/20/20	15:25 Eastern		Water			X	X	2	
SHP-2016-3B-SPR20 (680-184098-15)	5/20/20	13:50 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:	Date/Time: 5-21-20 1630	Company: TA	Received by:	Date/Time: 5/22/20 0920	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:		

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-184098-1

Login Number: 184098
List Number: 1
Creator: Laughlin, Paul 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?	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: 680-184098-1

Login Number: 184098
List Number: 2
Creator: Lubin, Julius C

List Source: Eurofins TestAmerica, Denver
List Creation: 05/22/20 12:37 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").	True	
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: 680-184215-1
Client Project/Site: JV, LTM - SHL Spring 2020

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

Authorized for release by:
6/9/2020 5:33:25 PM

Kathryn Smith, Client Service Manager
(912)250-0275
kathy.smith@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.

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

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.
B	Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
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
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)
MQL	Method Quantitation Limit
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)

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
680-184215-1	EPA-PZ-2012-3A-SPR20	Water	05/21/20 08:40	05/23/20 08:45	
680-184215-2	EPA-PZ-2012-3B-SPR20	Water	05/21/20 09:45	05/23/20 08:45	
680-184215-3	SHL-DUP04-SPR20	Water	05/21/20 08:00	05/23/20 08:45	
680-184215-4	SHM-05-41B-SPR20	Water	05/21/20 15:30	05/23/20 08:45	
680-184215-5	SHM-05-41C-SPR20	Water	05/21/20 14:20	05/23/20 08:45	
680-184215-6	SHM-13-03-SPR20	Water	05/21/20 12:10	05/23/20 08:45	
680-184215-7	SHM-93-22B-SPR20	Water	05/21/20 13:30	05/23/20 08:45	
680-184215-8	SHP-01-38A-SPR20	Water	05/21/20 14:30	05/23/20 08:45	
680-184215-9	SHP-2016-06A-SPR20	Water	05/21/20 09:10	05/23/20 08:45	
680-184215-10	SHP-2016-06B-SPR20	Water	05/21/20 10:55	05/23/20 08:45	
680-184215-11	SHP-2016-06C-SPR20	Water	05/21/20 12:55	05/23/20 08:45	
680-184215-12	SHP-2016-4A-SPR20	Water	05/21/20 11:25	05/23/20 08:45	
680-184215-13	SHP-2016-4B-SPR20	Water	05/21/20 10:10	05/23/20 08:45	
680-184215-14	SHP-2016-5A-SPR20	Water	05/21/20 15:50	05/23/20 08:45	
680-184215-15	SHP-2016-5B-SPR20	Water	05/21/20 15:00	05/23/20 08:45	

Job ID: 680-184215-1

Laboratory: Eurofins TestAmerica, Savannah

Narrative

CASE NARRATIVE
Client: Seres Engineering & Services LLC
Project: JV, LTM - SHL Spring 2020

Report Number: 680-184215-1

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 05/23/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.6º C and 4.4º C.

METALS (ICP) - DISSOLVED
Samples EPA-PZ-2012-3A-SPR20 (680-184215-1), EPA-PZ-2012-3B-SPR20 (680-184215-2), SHL-DUP04-SPR20 (680-184215-3), SHM-05-41B-SPR20 (680-184215-4), SHM-05-41C-SPR20 (680-184215-5), SHM-13-03-SPR20 (680-184215-6), SHM-93-22B-SPR20 (680-184215-7), SHP-01-38A-SPR20 (680-184215-8), SHP-2016-06A-SPR20 (680-184215-9), SHP-2016-06B-SPR20 (680-184215-10), SHP-2016-06C-SPR20 (680-184215-11), SHP-2016-4A-SPR20 (680-184215-12), SHP-2016-4B-SPR20 (680-184215-13), SHP-2016-5A-SPR20 (680-184215-14) and SHP-2016-5B-SPR20 (680-184215-15) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/29/2020 and 06/03/2020 and analyzed on 06/02/2020 and 06/06/2020.

Manganese was detected in method blank MB 680-621071/1-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 MS/MSD of sample EPA-PZ-2012-3B-SPR20 (680-184215-2) in batch 680-620833.

Manganese recovered low for the MS of sample SHM-05-41C-SPR20-MSMS (680-184215-5) in batch 680-620833.

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-SPR20 (680-184215-1), EPA-PZ-2012-3B-SPR20 (680-184215-2), SHL-DUP04-SPR20 (680-184215-3), SHM-05-41B-SPR20 (680-184215-4), SHM-05-41C-SPR20 (680-184215-5), SHM-13-03-SPR20 (680-184215-6), SHM-93-22B-SPR20 (680-184215-7), SHP-01-38A-SPR20 (680-184215-8), SHP-2016-06A-SPR20 (680-184215-9), SHP-2016-06B-SPR20 (680-184215-10), SHP-2016-06C-SPR20 (680-184215-11), SHP-2016-4A-SPR20 (680-184215-12), SHP-2016-4B-SPR20 (680-184215-13), SHP-2016-5A-SPR20 (680-184215-14) and SHP-2016-5B-SPR20 (680-184215-15) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 05/29/2020 and 06/03/2020 and analyzed on 06/01/2020 and 06/04/2020.

Arsenic recovered low for the MS/MSD of sample EPA-PZ-2012-3B-SPR20 (680-184215-2) in batch 680-620821.

Arsenic recovered low for the MS of sample SHM-05-41C-SPR20-MSMS (680-184215-5) in batch 680-620821.

Arsenic recovered high for the MSD of sample SHM-05-41C-SPR20-MSDMSD (680-184215-5) in batch 680-620821.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ALKALINITY

Job ID: 680-184215-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

Samples EPA-PZ-2012-3A-SPR20 (680-184215-1), EPA-PZ-2012-3B-SPR20 (680-184215-2), SHL-DUP04-SPR20 (680-184215-3), SHM-05-41B-SPR20 (680-184215-4), SHM-05-41C-SPR20 (680-184215-5), SHM-13-03-SPR20 (680-184215-6), SHM-93-22B-SPR20 (680-184215-7), SHP-01-38A-SPR20 (680-184215-8), SHP-2016-06A-SPR20 (680-184215-9), SHP-2016-06B-SPR20 (680-184215-10), SHP-2016-06C-SPR20 (680-184215-11), SHP-2016-4A-SPR20 (680-184215-12), SHP-2016-4B-SPR20 (680-184215-13), SHP-2016-5A-SPR20 (680-184215-14) and SHP-2016-5B-SPR20 (680-184215-15) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 05/29/2020.

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-2012-3A-SPR20 (680-184215-1), EPA-PZ-2012-3B-SPR20 (680-184215-2), SHL-DUP04-SPR20 (680-184215-3), SHM-05-41B-SPR20 (680-184215-4), SHM-05-41C-SPR20 (680-184215-5), SHM-13-03-SPR20 (680-184215-6), SHM-93-22B-SPR20 (680-184215-7), SHP-01-38A-SPR20 (680-184215-8), SHP-2016-06A-SPR20 (680-184215-9), SHP-2016-06B-SPR20 (680-184215-10), SHP-2016-06C-SPR20 (680-184215-11), SHP-2016-4A-SPR20 (680-184215-12), SHP-2016-4B-SPR20 (680-184215-13), SHP-2016-5A-SPR20 (680-184215-14) and SHP-2016-5B-SPR20 (680-184215-15) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 06/04/2020 and 06/05/2020.

Chloride recovered low for the MS/MSD of sample SHM-05-41C-SPR20 (680-184215-5) in batch 680-621153.

Samples EPA-PZ-2012-3A-SPR20 (680-184215-1)[10X], SHM-05-41B-SPR20 (680-184215-4)[5X] and SHM-05-41C-SPR20 (680-184215-5)[25X] 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.

TOTAL ORGANIC CARBON (TOC)

Samples EPA-PZ-2012-3A-SPR20 (680-184215-1), EPA-PZ-2012-3B-SPR20 (680-184215-2), SHL-DUP04-SPR20 (680-184215-3), SHM-05-41B-SPR20 (680-184215-4), SHM-05-41C-SPR20 (680-184215-5), SHM-13-03-SPR20 (680-184215-6), SHM-93-22B-SPR20 (680-184215-7), SHP-01-38A-SPR20 (680-184215-8), SHP-2016-06A-SPR20 (680-184215-9), SHP-2016-06B-SPR20 (680-184215-10), SHP-2016-06C-SPR20 (680-184215-11), SHP-2016-4A-SPR20 (680-184215-12), SHP-2016-4B-SPR20 (680-184215-13), SHP-2016-5A-SPR20 (680-184215-14) and SHP-2016-5B-SPR20 (680-184215-15) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 06/05/2020.

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: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: EPA-PZ-2012-3A-SPR20

Lab Sample ID: 680-184215-1
Date Collected: 05/21/20 08:40
Matrix: Water
Date Received: 05/23/20 08:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27		5.0	2.0	mg/L			06/04/20 21:37	10
Sulfate	4.0	U	10	4.0	mg/L			06/04/20 21:37	10

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	14000		50	17	ug/L		05/29/20 13:26	06/02/20 02:29	1
Manganese	890		10	1.0	ug/L		05/29/20 13:26	06/02/20 02:29	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	17		3.0	1.5	ug/L		05/29/20 13:26	06/01/20 15:23	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	100		10	3.1	mg/L			05/29/20 13:05	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	9.4		1.0	0.35	mg/L			06/05/20 03:38	1

Client Sample ID: EPA-PZ-2012-3B-SPR20

Lab Sample ID: 680-184215-2
Date Collected: 05/21/20 09:45
Matrix: Water
Date Received: 05/23/20 08:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27		0.50	0.20	mg/L			06/04/20 19:17	1
Sulfate	15		1.0	0.40	mg/L			06/04/20 19:17	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	44000	J	50	17	ug/L		05/29/20 13:26	06/02/20 01:34	1
Manganese	5600	J	10	1.0	ug/L		05/29/20 13:26	06/02/20 01:34	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3200	J	3.0	1.5	ug/L		05/29/20 13:26	06/01/20 14:40	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	180		10	3.1	mg/L			05/29/20 13:21	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			06/05/20 01:45	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: SHL-DUP04-SPR20

Lab Sample ID: 680-184215-3
Date Collected: 05/21/20 08:00
Matrix: Water
Date Received: 05/23/20 08:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.48	J	0.50	0.20	mg/L			06/04/20 21:49	1
Sulfate	16		1.0	0.40	mg/L			06/04/20 21:49	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	15000		50	17	ug/L		05/29/20 13:26	06/02/20 02:06	1
Manganese	1300		10	1.0	ug/L		05/29/20 13:26	06/02/20 02:06	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	86		3.0	1.5	ug/L		05/29/20 13:26	06/01/20 15:05	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	60		10	3.1	mg/L			05/29/20 13:25	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			06/05/20 03:55	1

Client Sample ID: SHM-05-41B-SPR20

Lab Sample ID: 680-184215-4
Date Collected: 05/21/20 15:30
Matrix: Water
Date Received: 05/23/20 08:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	430		2.5	1.0	mg/L			06/05/20 16:30	5
Sulfate	5.7		1.0	0.40	mg/L			06/04/20 22:02	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	22000		50	17	ug/L		05/29/20 13:26	06/02/20 14:49	1
Manganese	740		10	1.0	ug/L		05/29/20 13:26	06/02/20 02:57	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		05/29/20 13:26	06/01/20 15:44	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	84		10	3.1	mg/L			05/29/20 13:31	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			06/05/20 04:12	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: SHM-05-41C-SPR20

Lab Sample ID: 680-184215-5
Date Collected: 05/21/20 14:20
Matrix: Water
Date Received: 05/23/20 08:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1200		13	5.0	mg/L			06/05/20 15:40	25
Sulfate	10		1.0	0.40	mg/L			06/04/20 20:59	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	14000		50	17	ug/L		05/29/20 13:26	06/02/20 01:10	1
Manganese	2400	J	10	1.0	ug/L		05/29/20 13:26	06/02/20 01:10	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	660	J	3.0	1.5	ug/L		05/29/20 13:26	06/01/20 14:22	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	360		10	3.1	mg/L			05/29/20 13:37	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	3.1		1.0	0.35	mg/L			06/05/20 07:02	1

Client Sample ID: SHM-13-03-SPR20

Lab Sample ID: 680-184215-6
Date Collected: 05/21/20 12:10
Matrix: Water
Date Received: 05/23/20 08:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	180		0.50	0.20	mg/L			06/04/20 22:15	1
Sulfate	2.9		1.0	0.40	mg/L			06/04/20 22:15	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	10000		50	17	ug/L		05/29/20 13:26	06/02/20 02:11	1
Manganese	11000		10	1.0	ug/L		05/29/20 13:26	06/02/20 02:11	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		05/29/20 13:26	06/01/20 15:09	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	220		10	3.1	mg/L			05/29/20 13:43	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			06/05/20 04:29	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: SHM-93-22B-SPR20

Lab Sample ID: 680-184215-7
Date Collected: 05/21/20 13:30
Matrix: Water
Date Received: 05/23/20 08:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	34		0.50	0.20	mg/L			06/04/20 22:27	1
Sulfate	7.9		1.0	0.40	mg/L			06/04/20 22:27	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	10000		50	17	ug/L		05/29/20 13:26	06/02/20 02:20	1
Manganese	9300		10	1.0	ug/L		05/29/20 13:26	06/02/20 02:20	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	170		3.0	1.5	ug/L		05/29/20 13:26	06/01/20 15:16	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	240		10	3.1	mg/L			05/29/20 13:48	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			06/05/20 04:45	1

Client Sample ID: SHP-01-38A-SPR20

Lab Sample ID: 680-184215-8
Date Collected: 05/21/20 14:30
Matrix: Water
Date Received: 05/23/20 08:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.49	J	0.50	0.20	mg/L			06/04/20 22:40	1
Sulfate	16		1.0	0.40	mg/L			06/04/20 22:40	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	13000		50	17	ug/L		05/29/20 13:26	06/02/20 14:44	1
Manganese	1200		10	1.0	ug/L		05/29/20 13:26	06/02/20 02:53	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	87		3.0	1.5	ug/L		05/29/20 13:26	06/01/20 15:41	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	60		10	3.1	mg/L			05/29/20 13:53	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			06/05/20 05:02	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: SHP-2016-06A-SPR20

Lab Sample ID: 680-184215-9
Date Collected: 05/21/20 09:10
Matrix: Water
Date Received: 05/23/20 08:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	8.7		0.50	0.20	mg/L			06/04/20 22:53	1
Sulfate	36		1.0	0.40	mg/L			06/04/20 22:53	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	160		50	17	ug/L		05/29/20 13:26	06/02/20 01:57	1
Manganese	920		10	1.0	ug/L		05/29/20 13:26	06/02/20 01:57	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		05/29/20 13:26	06/01/20 14:58	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	140		10	3.1	mg/L			05/29/20 13:58	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			06/05/20 05:21	1

Client Sample ID: SHP-2016-06B-SPR20

Lab Sample ID: 680-184215-10
Date Collected: 05/21/20 10:55
Matrix: Water
Date Received: 05/23/20 08:45

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			06/04/20 23:05	1
Sulfate	210		1.0	0.40	mg/L			06/04/20 23:05	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	310		50	17	ug/L		05/29/20 13:26	06/02/20 02:34	1
Manganese	430		10	1.0	ug/L		05/29/20 13:26	06/02/20 02:34	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		05/29/20 13:26	06/01/20 15:26	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	260		10	3.1	mg/L			05/29/20 14:04	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	14		1.0	0.35	mg/L			06/05/20 07:49	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: SHP-2016-06C-SPR20

Lab Sample ID: 680-184215-11
Date Collected: 05/21/20 12:55
Matrix: Water
Date Received: 05/23/20 08:45

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			06/04/20 23:18	1
Sulfate	10		1.0	0.40	mg/L			06/04/20 23:18	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	100		50	17	ug/L		05/29/20 13:26	06/02/20 02:15	1
Manganese	200		10	1.0	ug/L		05/29/20 13:26	06/02/20 02:15	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	310		3.0	1.5	ug/L		05/29/20 13:26	06/01/20 15:12	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	130		10	3.1	mg/L			05/29/20 14:09	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	0.47	J	1.0	0.35	mg/L			06/05/20 08:08	1

Client Sample ID: SHP-2016-4A-SPR20

Lab Sample ID: 680-184215-12
Date Collected: 05/21/20 11:25
Matrix: Water
Date Received: 05/23/20 08:45

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			06/05/20 00:21	1
Sulfate	6.9		1.0	0.40	mg/L			06/05/20 00:21	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	68		50	17	ug/L		05/29/20 13:26	06/02/20 02:39	1
Manganese	70		10	1.0	ug/L		05/29/20 13:26	06/02/20 02:39	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		05/29/20 13:26	06/01/20 15:30	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	11		10	3.1	mg/L			05/29/20 14:35	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	0.70	J	1.0	0.35	mg/L			06/05/20 08:25	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: SHP-2016-4B-SPR20

Lab Sample ID: 680-184215-13
Date Collected: 05/21/20 10:10
Matrix: Water
Date Received: 05/23/20 08:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.0		0.50	0.20	mg/L			06/05/20 00:59	1
Sulfate	4.0		1.0	0.40	mg/L			06/05/20 00:59	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	29000		50	17	ug/L		05/29/20 13:26	06/02/20 02:25	1
Manganese	1900		10	1.0	ug/L		05/29/20 13:26	06/02/20 02:25	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	650		3.0	1.5	ug/L		05/29/20 13:26	06/01/20 15:19	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	91		10	3.1	mg/L			05/29/20 14:44	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			06/05/20 08:42	1

Client Sample ID: SHP-2016-5A-SPR20

Lab Sample ID: 680-184215-14
Date Collected: 05/21/20 15:50
Matrix: Water
Date Received: 05/23/20 08:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	31		0.50	0.20	mg/L			06/05/20 01:12	1
Sulfate	2.1		1.0	0.40	mg/L			06/05/20 01:12	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	2000		50	17	ug/L		06/03/20 12:06	06/06/20 02:56	1
Manganese	150	B	10	1.0	ug/L		06/03/20 12:06	06/06/20 02:56	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.0		3.0	1.5	ug/L		06/03/20 12:06	06/04/20 12:42	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	60		10	3.1	mg/L			05/29/20 14:49	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	6.5		1.0	0.35	mg/L			06/05/20 09:28	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: SHP-2016-5B-SPR20

Lab Sample ID: 680-184215-15

Date Collected: 05/21/20 15:00
Date Received: 05/23/20 08:45

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	12		0.50	0.20	mg/L			06/05/20 01:24	1
Sulfate	1.6		1.0	0.40	mg/L			06/05/20 01:24	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	47000		50	17	ug/L		05/29/20 13:26	06/02/20 02:01	1
Manganese	2500		10	1.0	ug/L		05/29/20 13:26	06/02/20 02:01	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	470		3.0	1.5	ug/L		05/29/20 13:26	06/01/20 15:02	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	150		10	3.1	mg/L			05/29/20 14:54	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			06/05/20 09:45	1

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 680-621153/101 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621153

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.20	U	0.50	0.20	mg/L			06/04/20 16:38	1
Sulfate	0.40	U M	1.0	0.40	mg/L			06/04/20 16:38	1

Lab Sample ID: LCS 680-621153/102 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621153

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.89		mg/L		99	87 - 111
Sulfate	10.0	10.3		mg/L		103	87 - 112

Lab Sample ID: LCSD 680-621153/103 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621153

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	10.3		mg/L		103	87 - 112	1	15

Lab Sample ID: 680-184215-2 MS — **Client Sample ID: EPA-PZ-2012-3B-SPR20-MS**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621153

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	27		10.0	37.3		mg/L		101	87 - 111
Sulfate	15		10.0	25.3		mg/L		99	87 - 112

Lab Sample ID: 680-184215-2 MSD — **Client Sample ID: EPA-PZ-2012-3B-SPR20-MSD**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621153

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	27		10.0	37.4		mg/L		101	87 - 111	0	15
Sulfate	15		10.0	25.4		mg/L		100	87 - 112	0	15

Lab Sample ID: 680-184215-5 MS — **Client Sample ID: SHM-05-41C-SPR20-MS**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621153

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	1200	J	10.0	1150	J 4	mg/L		-35	87 - 111
Sulfate	10		10.0	19.8		mg/L		95	87 - 112

Lab Sample ID: 680-184215-5 MSD — **Client Sample ID: SHM-05-41C-SPR20-MSD**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621153

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	1200	J	10.0	1150	J 4	mg/L		-47	87 - 111	0	15
Sulfate	10		10.0	20.1		mg/L		98	87 - 112	1	15

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 680-621341/131 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621341

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.20	U	0.50	0.20	mg/L			06/04/20 23:43	1
Sulfate	0.40	U M	1.0	0.40	mg/L			06/04/20 23:43	1

Lab Sample ID: LCS 680-621341/132 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621341

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	10.1		mg/L		101	87 - 112

Lab Sample ID: LCSD 680-621341/133 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621341

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.87		mg/L		99	87 - 111	0	15
Sulfate	10.0	10.3		mg/L		103	87 - 112	1	15

Lab Sample ID: 680-184215-12 MS — **Client Sample ID: SHP-2016-4A-SPR20**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621341

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	4.2		10.0	14.3		mg/L		101	87 - 111
Sulfate	6.9		10.0	17.2		mg/L		102	87 - 112

Lab Sample ID: 680-184215-12 MSD — **Client Sample ID: SHP-2016-4A-SPR20**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621341

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	4.2		10.0	14.4		mg/L		101	87 - 111	0	15
Sulfate	6.9		10.0	17.2		mg/L		103	87 - 112	0	15

Lab Sample ID: MB 680-621443/2 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621443

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.20	U	0.50	0.20	mg/L			06/05/20 14:49	1
Sulfate	0.40	U	1.0	0.40	mg/L			06/05/20 14:49	1

Lab Sample ID: LCS 680-621443/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621443

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	10.2		mg/L		102	87 - 112

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: LCSD 680-621443/4
Matrix: Water
Analysis Batch: 621443

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	9.86		mg/L		99	87 - 111	0	15
Sulfate	10.0	10.5		mg/L		105	87 - 112	2	15

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-620442/1-A
Matrix: Water
Analysis Batch: 620833

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 620442

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		05/29/20 13:26	06/02/20 01:01	1
Manganese	1.0	U	10	1.0	ug/L		05/29/20 13:26	06/02/20 01:01	1

Lab Sample ID: LCS 680-620442/2-A
Matrix: Water
Analysis Batch: 620833

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 620442

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5010	4610		ug/L		92	87 - 115
Manganese	400	364		ug/L		91	90 - 114

Lab Sample ID: MB 680-621071/1-A
Matrix: Water
Analysis Batch: 621552

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 621071

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		06/03/20 12:06	06/06/20 01:46	1
Manganese	8.57	J	10	1.0	ug/L		06/03/20 12:06	06/06/20 01:46	1

Lab Sample ID: LCS 680-621071/2-A
Matrix: Water
Analysis Batch: 621552

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 621071

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5010	4730		ug/L		94	87 - 115
Manganese	400	394		ug/L		98	90 - 114

Lab Sample ID: 680-184215-2 MS
Matrix: Water
Analysis Batch: 620833

Client Sample ID: EPA-PZ-2012-3B-SPR20-MS
Prep Type: Dissolved
Prep Batch: 620442

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	44000	J	5010	47800	4	ug/L		67	87 - 115
Manganese	5600	J	400	5730	4	ug/L		36	90 - 114

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 680-184215-2 MSD — **Client Sample ID: EPA-PZ-2012-3B-SPR20-MSD**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 620833 — **Prep Batch: 620442**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron	44000	J	5010	48300	4	ug/L		79	87 - 115	1	20
Manganese	5600	J	400	5800	4	ug/L		55	90 - 114	1	20

Lab Sample ID: 680-184215-5 MS — **Client Sample ID: SHM-05-41C-SPR20-MS**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 620833 — **Prep Batch: 620442**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	14000		5010	18100		ug/L		89	87 - 115
Manganese	2400	J	400	2700	4	ug/L		72	90 - 114

Lab Sample ID: 680-184215-5 MSD — **Client Sample ID: SHM-05-41C-SPR20-MSD**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 620833 — **Prep Batch: 620442**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron	14000		5010	18700		ug/L		101	87 - 115	3	20
Manganese	2400	J	400	2790	4	ug/L		95	90 - 114	3	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-620441/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 620821 — **Prep Batch: 620441**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.5	U	3.0	1.5	ug/L		05/29/20 13:26	06/01/20 14:15	1

Lab Sample ID: LCS 680-620441/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 620821 — **Prep Batch: 620441**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	115		ug/L		115	84 - 116

Lab Sample ID: MB 680-621070/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 621368 — **Prep Batch: 621070**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.5	U	3.0	1.5	ug/L		06/03/20 12:06	06/04/20 14:23	1

Lab Sample ID: LCS 680-621070/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 621368 — **Prep Batch: 621070**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	105		ug/L		105	84 - 116

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 680-184215-2 MS — **Client Sample ID: EPA-PZ-2012-3B-SPR20-MS**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 620821 — **Prep Batch: 620441**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	3200	J	100	2800	4	ug/L		-417	84 - 116

Lab Sample ID: 680-184215-2 MSD — **Client Sample ID: EPA-PZ-2012-3B-SPR20-MSD**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 620821 — **Prep Batch: 620441**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	3200	J	100	2850	4	ug/L		-368	84 - 116	2	20

Lab Sample ID: 680-184215-5 MS — **Client Sample ID: SHM-05-41C-SPR20-MS**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 620821 — **Prep Batch: 620441**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	660	J	100	740	4	ug/L		79	84 - 116

Lab Sample ID: 680-184215-5 MSD — **Client Sample ID: SHM-05-41C-SPR20-MSD**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 620821 — **Prep Batch: 620441**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	660	J	100	839	4	ug/L		177	84 - 116	12	20

Method: 9060A - Organic Carbon, Dissolved (DOC)

Lab Sample ID: MB 280-497612/21 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

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			06/04/20 21:18	1

Lab Sample ID: MB 280-497612/54 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

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			06/05/20 06:33	1

Lab Sample ID: LCS 280-497612/20 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	25.0	25.4		mg/L		101	88 - 112

Method: 9060A - Organic Carbon, Dissolved (DOC) (Continued)

Lab Sample ID: LCS 280-497612/53 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Dissolved Organic Carbon			25.0	26.8		mg/L		107	88 - 112		

Lab Sample ID: 680-184215-2 MS — **Client Sample ID: EPA-PZ-2012-3B-SPR20-MS**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Dissolved Organic Carbon	1.7		25.0	28.5		mg/L		107	88 - 112		

Lab Sample ID: 680-184215-2 MSD — **Client Sample ID: EPA-PZ-2012-3B-SPR20-MSD**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Organic Carbon	1.7		25.0	28.3		mg/L		106	88 - 112	1	15

Lab Sample ID: 680-184215-5 MS — **Client Sample ID: SHM-05-41C-SPR20-MS**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Dissolved Organic Carbon	3.1		25.0	29.7		mg/L		106	88 - 112		

Lab Sample ID: 680-184215-5 MSD — **Client Sample ID: SHM-05-41C-SPR20-MSD**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Organic Carbon	3.1		25.0	29.7		mg/L		106	88 - 112	0	15

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 280-496866/31 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 496866

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	3.1	U	10	3.1	mg/L			05/29/20 14:30	1

Lab Sample ID: MB 280-496866/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 496866

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	3.1	U	10	3.1	mg/L			05/29/20 12:17	1

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: LCS 280-496866/30
Matrix: Water
Analysis Batch: 496866

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Alkalinity			200	205		mg/L		103	89 - 109		

Lab Sample ID: LCS 280-496866/4
Matrix: Water
Analysis Batch: 496866

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Alkalinity			200	203		mg/L		102	89 - 109		

Lab Sample ID: 680-184215-12 DU
Matrix: Water
Analysis Batch: 496866

Client Sample ID: SHP-2016-4A-SPR20
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity	11			10.7		mg/L				7	10

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

HPLC/IC

Analysis Batch: 621153

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-1	EPA-PZ-2012-3A-SPR20	Total/NA	Water	9056A	
680-184215-2	EPA-PZ-2012-3B-SPR20	Total/NA	Water	9056A	
680-184215-3	SHL-DUP04-SPR20	Total/NA	Water	9056A	
680-184215-4	SHM-05-41B-SPR20	Total/NA	Water	9056A	
680-184215-5	SHM-05-41C-SPR20	Total/NA	Water	9056A	
680-184215-6	SHM-13-03-SPR20	Total/NA	Water	9056A	
680-184215-7	SHM-93-22B-SPR20	Total/NA	Water	9056A	
680-184215-8	SHP-01-38A-SPR20	Total/NA	Water	9056A	
680-184215-9	SHP-2016-06A-SPR20	Total/NA	Water	9056A	
680-184215-10	SHP-2016-06B-SPR20	Total/NA	Water	9056A	
680-184215-11	SHP-2016-06C-SPR20	Total/NA	Water	9056A	
MB 680-621153/101	Method Blank	Total/NA	Water	9056A	
LCS 680-621153/102	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-621153/103	Lab Control Sample Dup	Total/NA	Water	9056A	
680-184215-2 MS	EPA-PZ-2012-3B-SPR20-MS	Total/NA	Water	9056A	
680-184215-2 MSD	EPA-PZ-2012-3B-SPR20-MSD	Total/NA	Water	9056A	
680-184215-5 MS	SHM-05-41C-SPR20-MS	Total/NA	Water	9056A	
680-184215-5 MSD	SHM-05-41C-SPR20-MSD	Total/NA	Water	9056A	

Analysis Batch: 621341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-12	SHP-2016-4A-SPR20	Total/NA	Water	9056A	
680-184215-13	SHP-2016-4B-SPR20	Total/NA	Water	9056A	
680-184215-14	SHP-2016-5A-SPR20	Total/NA	Water	9056A	
680-184215-15	SHP-2016-5B-SPR20	Total/NA	Water	9056A	
MB 680-621341/131	Method Blank	Total/NA	Water	9056A	
LCS 680-621341/132	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-621341/133	Lab Control Sample Dup	Total/NA	Water	9056A	
680-184215-12 MS	SHP-2016-4A-SPR20	Total/NA	Water	9056A	
680-184215-12 MSD	SHP-2016-4A-SPR20	Total/NA	Water	9056A	

Analysis Batch: 621443

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-4	SHM-05-41B-SPR20	Total/NA	Water	9056A	
680-184215-5	SHM-05-41C-SPR20	Total/NA	Water	9056A	
MB 680-621443/2	Method Blank	Total/NA	Water	9056A	
LCS 680-621443/3	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-621443/4	Lab Control Sample Dup	Total/NA	Water	9056A	

Metals

Prep Batch: 620441

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-1	EPA-PZ-2012-3A-SPR20	Dissolved	Water	3005A	
680-184215-2	EPA-PZ-2012-3B-SPR20	Dissolved	Water	3005A	
680-184215-3	SHL-DUP04-SPR20	Dissolved	Water	3005A	
680-184215-4	SHM-05-41B-SPR20	Dissolved	Water	3005A	
680-184215-5	SHM-05-41C-SPR20	Dissolved	Water	3005A	
680-184215-6	SHM-13-03-SPR20	Dissolved	Water	3005A	
680-184215-7	SHM-93-22B-SPR20	Dissolved	Water	3005A	
680-184215-8	SHP-01-38A-SPR20	Dissolved	Water	3005A	

Metals (Continued)

Prep Batch: 620441 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-9	SHP-2016-06A-SPR20	Dissolved	Water	3005A	
680-184215-10	SHP-2016-06B-SPR20	Dissolved	Water	3005A	
680-184215-11	SHP-2016-06C-SPR20	Dissolved	Water	3005A	
680-184215-12	SHP-2016-4A-SPR20	Dissolved	Water	3005A	
680-184215-13	SHP-2016-4B-SPR20	Dissolved	Water	3005A	
680-184215-15	SHP-2016-5B-SPR20	Dissolved	Water	3005A	
MB 680-620441/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-620441/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-184215-2 MS	EPA-PZ-2012-3B-SPR20-MS	Dissolved	Water	3005A	
680-184215-2 MSD	EPA-PZ-2012-3B-SPR20-MSD	Dissolved	Water	3005A	
680-184215-5 MS	SHM-05-41C-SPR20-MS	Dissolved	Water	3005A	
680-184215-5 MSD	SHM-05-41C-SPR20-MSD	Dissolved	Water	3005A	

Prep Batch: 620442

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-1	EPA-PZ-2012-3A-SPR20	Dissolved	Water	3005A	
680-184215-2	EPA-PZ-2012-3B-SPR20	Dissolved	Water	3005A	
680-184215-3	SHL-DUP04-SPR20	Dissolved	Water	3005A	
680-184215-4	SHM-05-41B-SPR20	Dissolved	Water	3005A	
680-184215-5	SHM-05-41C-SPR20	Dissolved	Water	3005A	
680-184215-6	SHM-13-03-SPR20	Dissolved	Water	3005A	
680-184215-7	SHM-93-22B-SPR20	Dissolved	Water	3005A	
680-184215-8	SHP-01-38A-SPR20	Dissolved	Water	3005A	
680-184215-9	SHP-2016-06A-SPR20	Dissolved	Water	3005A	
680-184215-10	SHP-2016-06B-SPR20	Dissolved	Water	3005A	
680-184215-11	SHP-2016-06C-SPR20	Dissolved	Water	3005A	
680-184215-12	SHP-2016-4A-SPR20	Dissolved	Water	3005A	
680-184215-13	SHP-2016-4B-SPR20	Dissolved	Water	3005A	
680-184215-15	SHP-2016-5B-SPR20	Dissolved	Water	3005A	
MB 680-620442/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-620442/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-184215-2 MS	EPA-PZ-2012-3B-SPR20-MS	Dissolved	Water	3005A	
680-184215-2 MSD	EPA-PZ-2012-3B-SPR20-MSD	Dissolved	Water	3005A	
680-184215-5 MS	SHM-05-41C-SPR20-MS	Dissolved	Water	3005A	
680-184215-5 MSD	SHM-05-41C-SPR20-MSD	Dissolved	Water	3005A	

Analysis Batch: 620821

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-1	EPA-PZ-2012-3A-SPR20	Dissolved	Water	6020A	620441
680-184215-2	EPA-PZ-2012-3B-SPR20	Dissolved	Water	6020A	620441
680-184215-3	SHL-DUP04-SPR20	Dissolved	Water	6020A	620441
680-184215-4	SHM-05-41B-SPR20	Dissolved	Water	6020A	620441
680-184215-5	SHM-05-41C-SPR20	Dissolved	Water	6020A	620441
680-184215-6	SHM-13-03-SPR20	Dissolved	Water	6020A	620441
680-184215-7	SHM-93-22B-SPR20	Dissolved	Water	6020A	620441
680-184215-8	SHP-01-38A-SPR20	Dissolved	Water	6020A	620441
680-184215-9	SHP-2016-06A-SPR20	Dissolved	Water	6020A	620441
680-184215-10	SHP-2016-06B-SPR20	Dissolved	Water	6020A	620441
680-184215-11	SHP-2016-06C-SPR20	Dissolved	Water	6020A	620441
680-184215-12	SHP-2016-4A-SPR20	Dissolved	Water	6020A	620441
680-184215-13	SHP-2016-4B-SPR20	Dissolved	Water	6020A	620441

Metals (Continued)

Analysis Batch: 620821 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-15	SHP-2016-5B-SPR20	Dissolved	Water	6020A	620441
MB 680-620441/1-A	Method Blank	Total Recoverable	Water	6020A	620441
LCS 680-620441/2-A	Lab Control Sample	Total Recoverable	Water	6020A	620441
680-184215-2 MS	EPA-PZ-2012-3B-SPR20-MS	Dissolved	Water	6020A	620441
680-184215-2 MSD	EPA-PZ-2012-3B-SPR20-MSD	Dissolved	Water	6020A	620441
680-184215-5 MS	SHM-05-41C-SPR20-MS	Dissolved	Water	6020A	620441
680-184215-5 MSD	SHM-05-41C-SPR20-MSD	Dissolved	Water	6020A	620441

Analysis Batch: 620833

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-1	EPA-PZ-2012-3A-SPR20	Dissolved	Water	6010C	620442
680-184215-2	EPA-PZ-2012-3B-SPR20	Dissolved	Water	6010C	620442
680-184215-3	SHL-DUP04-SPR20	Dissolved	Water	6010C	620442
680-184215-4	SHM-05-41B-SPR20	Dissolved	Water	6010C	620442
680-184215-5	SHM-05-41C-SPR20	Dissolved	Water	6010C	620442
680-184215-6	SHM-13-03-SPR20	Dissolved	Water	6010C	620442
680-184215-7	SHM-93-22B-SPR20	Dissolved	Water	6010C	620442
680-184215-8	SHP-01-38A-SPR20	Dissolved	Water	6010C	620442
680-184215-9	SHP-2016-06A-SPR20	Dissolved	Water	6010C	620442
680-184215-10	SHP-2016-06B-SPR20	Dissolved	Water	6010C	620442
680-184215-11	SHP-2016-06C-SPR20	Dissolved	Water	6010C	620442
680-184215-12	SHP-2016-4A-SPR20	Dissolved	Water	6010C	620442
680-184215-13	SHP-2016-4B-SPR20	Dissolved	Water	6010C	620442
680-184215-15	SHP-2016-5B-SPR20	Dissolved	Water	6010C	620442
MB 680-620442/1-A	Method Blank	Total Recoverable	Water	6010C	620442
LCS 680-620442/2-A	Lab Control Sample	Total Recoverable	Water	6010C	620442
680-184215-2 MS	EPA-PZ-2012-3B-SPR20-MS	Dissolved	Water	6010C	620442
680-184215-2 MSD	EPA-PZ-2012-3B-SPR20-MSD	Dissolved	Water	6010C	620442
680-184215-5 MS	SHM-05-41C-SPR20-MS	Dissolved	Water	6010C	620442
680-184215-5 MSD	SHM-05-41C-SPR20-MSD	Dissolved	Water	6010C	620442

Analysis Batch: 621030

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-4	SHM-05-41B-SPR20	Dissolved	Water	6010C	620442
680-184215-8	SHP-01-38A-SPR20	Dissolved	Water	6010C	620442

Prep Batch: 621070

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-14	SHP-2016-5A-SPR20	Dissolved	Water	3005A	
MB 680-621070/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-621070/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 621071

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-14	SHP-2016-5A-SPR20	Dissolved	Water	3005A	
MB 680-621071/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-621071/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 621368

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-14	SHP-2016-5A-SPR20	Dissolved	Water	6020A	621070

Metals (Continued)

Analysis Batch: 621368 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 680-621070/1-A	Method Blank	Total Recoverable	Water	6020A	621070
LCS 680-621070/2-A	Lab Control Sample	Total Recoverable	Water	6020A	621070

Analysis Batch: 621552

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-14	SHP-2016-5A-SPR20	Dissolved	Water	6010C	621071
MB 680-621071/1-A	Method Blank	Total Recoverable	Water	6010C	621071
LCS 680-621071/2-A	Lab Control Sample	Total Recoverable	Water	6010C	621071

General Chemistry

Analysis Batch: 496866

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-1	EPA-PZ-2012-3A-SPR20	Total/NA	Water	SM 2320B	
680-184215-2	EPA-PZ-2012-3B-SPR20	Total/NA	Water	SM 2320B	
680-184215-3	SHL-DUP04-SPR20	Total/NA	Water	SM 2320B	
680-184215-4	SHM-05-41B-SPR20	Total/NA	Water	SM 2320B	
680-184215-5	SHM-05-41C-SPR20	Total/NA	Water	SM 2320B	
680-184215-6	SHM-13-03-SPR20	Total/NA	Water	SM 2320B	
680-184215-7	SHM-93-22B-SPR20	Total/NA	Water	SM 2320B	
680-184215-8	SHP-01-38A-SPR20	Total/NA	Water	SM 2320B	
680-184215-9	SHP-2016-06A-SPR20	Total/NA	Water	SM 2320B	
680-184215-10	SHP-2016-06B-SPR20	Total/NA	Water	SM 2320B	
680-184215-11	SHP-2016-06C-SPR20	Total/NA	Water	SM 2320B	
680-184215-12	SHP-2016-4A-SPR20	Total/NA	Water	SM 2320B	
680-184215-13	SHP-2016-4B-SPR20	Total/NA	Water	SM 2320B	
680-184215-14	SHP-2016-5A-SPR20	Total/NA	Water	SM 2320B	
680-184215-15	SHP-2016-5B-SPR20	Total/NA	Water	SM 2320B	
MB 280-496866/31	Method Blank	Total/NA	Water	SM 2320B	
MB 280-496866/5	Method Blank	Total/NA	Water	SM 2320B	
LCS 280-496866/30	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 280-496866/4	Lab Control Sample	Total/NA	Water	SM 2320B	
680-184215-12 DU	SHP-2016-4A-SPR20	Total/NA	Water	SM 2320B	

Analysis Batch: 497612

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184215-1	EPA-PZ-2012-3A-SPR20	Dissolved	Water	9060A	
680-184215-2	EPA-PZ-2012-3B-SPR20	Dissolved	Water	9060A	
680-184215-3	SHL-DUP04-SPR20	Dissolved	Water	9060A	
680-184215-4	SHM-05-41B-SPR20	Dissolved	Water	9060A	
680-184215-5	SHM-05-41C-SPR20	Dissolved	Water	9060A	
680-184215-6	SHM-13-03-SPR20	Dissolved	Water	9060A	
680-184215-7	SHM-93-22B-SPR20	Dissolved	Water	9060A	
680-184215-8	SHP-01-38A-SPR20	Dissolved	Water	9060A	
680-184215-9	SHP-2016-06A-SPR20	Dissolved	Water	9060A	
680-184215-10	SHP-2016-06B-SPR20	Dissolved	Water	9060A	
680-184215-11	SHP-2016-06C-SPR20	Dissolved	Water	9060A	
680-184215-12	SHP-2016-4A-SPR20	Dissolved	Water	9060A	
680-184215-13	SHP-2016-4B-SPR20	Dissolved	Water	9060A	
680-184215-14	SHP-2016-5A-SPR20	Dissolved	Water	9060A	
680-184215-15	SHP-2016-5B-SPR20	Dissolved	Water	9060A	

General Chemistry (Continued)

Analysis Batch: 497612 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 280-497612/21	Method Blank	Dissolved	Water	9060A	
MB 280-497612/54	Method Blank	Dissolved	Water	9060A	
LCS 280-497612/20	Lab Control Sample	Dissolved	Water	9060A	
LCS 280-497612/53	Lab Control Sample	Dissolved	Water	9060A	
680-184215-2 MS	EPA-PZ-2012-3B-SPR20-MS	Dissolved	Water	9060A	
680-184215-2 MSD	EPA-PZ-2012-3B-SPR20-MSD	Dissolved	Water	9060A	
680-184215-5 MS	SHM-05-41C-SPR20-MS	Dissolved	Water	9060A	
680-184215-5 MSD	SHM-05-41C-SPR20-MSD	Dissolved	Water	9060A	

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: EPA-PZ-2012-3A-SPR20

Lab Sample ID: 680-184215-1

Date Collected: 05/21/20 08:40
Matrix: Water
Date Received: 05/23/20 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		10	5 mL	5 mL	621153	06/04/20 21:37	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 02:29	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620441	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620821	06/01/20 15:23	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 03:38	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 13:05	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: EPA-PZ-2012-3B-SPR20

Lab Sample ID: 680-184215-2

Date Collected: 05/21/20 09:45
Matrix: Water
Date Received: 05/23/20 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	621153	06/04/20 19:17	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 01:34	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620441	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620821	06/01/20 14:40	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 01:45	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 13:21	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHL-DUP04-SPR20

Lab Sample ID: 680-184215-3

Date Collected: 05/21/20 08:00
Matrix: Water
Date Received: 05/23/20 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	621153	06/04/20 21:49	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 02:06	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620441	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620821	06/01/20 15:05	BJB	TAL SAV
	Instrument ID: ICPMSD									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: SHL-DUP04-SPR20

Lab Sample ID: 680-184215-3

Date Collected: 05/21/20 08:00
Date Received: 05/23/20 08:45

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	497612	06/05/20 03:55	JMB	TAL DEN
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 13:25	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHM-05-41B-SPR20

Lab Sample ID: 680-184215-4

Date Collected: 05/21/20 15:30
Date Received: 05/23/20 08:45

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	621153	06/04/20 22:02	UI	TAL SAV
	Instrument ID:	CICK								
Total/NA	Analysis	9056A		5	5 mL	5 mL	621443	06/05/20 16:30	CS	TAL SAV
	Instrument ID:	CICK								
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 02:57	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			621030	06/02/20 14:49	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620441	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620821	06/01/20 15:44	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 04:12	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 13:31	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHM-05-41C-SPR20

Lab Sample ID: 680-184215-5

Date Collected: 05/21/20 14:20
Date Received: 05/23/20 08:45

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	621153	06/04/20 20:59	UI	TAL SAV
	Instrument ID:	CICK								
Total/NA	Analysis	9056A		25	5 mL	5 mL	621443	06/05/20 15:40	CS	TAL SAV
	Instrument ID:	CICK								
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 01:10	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620441	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620821	06/01/20 14:22	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 07:02	JMB	TAL DEN
	Instrument ID:	WC_SHI3								

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: SHM-05-41C-SPR20 — Lab Sample ID: 680-184215-5

Date Collected: 05/21/20 14:20 — **Matrix: Water**
Date Received: 05/23/20 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	SM 2320B		1			496866	05/29/20 13:37	SPG	TAL DEN

Client Sample ID: SHM-13-03-SPR20 — Lab Sample ID: 680-184215-6

Date Collected: 05/21/20 12:10 — **Matrix: Water**
Date Received: 05/23/20 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	621153	06/04/20 22:15	UI	TAL SAV
	Instrument ID:	CICK								
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 02:11	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620441	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620821	06/01/20 15:09	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 04:29	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 13:43	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHM-93-22B-SPR20 — Lab Sample ID: 680-184215-7

Date Collected: 05/21/20 13:30 — **Matrix: Water**
Date Received: 05/23/20 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	621153	06/04/20 22:27	UI	TAL SAV
	Instrument ID:	CICK								
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 02:20	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620441	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620821	06/01/20 15:16	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 04:45	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 13:48	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHP-01-38A-SPR20 — Lab Sample ID: 680-184215-8

Date Collected: 05/21/20 14:30 — **Matrix: Water**
Date Received: 05/23/20 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	621153	06/04/20 22:40	UI	TAL SAV
	Instrument ID:	CICK								

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: SHP-01-38A-SPR20

Lab Sample ID: 680-184215-8
Date Collected: 05/21/20 14:30
Matrix: Water
Date Received: 05/23/20 08:45

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	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 02:53	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			621030	06/02/20 14:44	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620441	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620821	06/01/20 15:41	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 05:02	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 13:53	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHP-2016-06A-SPR20

Lab Sample ID: 680-184215-9
Date Collected: 05/21/20 09:10
Matrix: Water
Date Received: 05/23/20 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	621153	06/04/20 22:53	UI	TAL SAV
	Instrument ID:	CICK								
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 01:57	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620441	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620821	06/01/20 14:58	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 05:21	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 13:58	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHP-2016-06B-SPR20

Lab Sample ID: 680-184215-10
Date Collected: 05/21/20 10:55
Matrix: Water
Date Received: 05/23/20 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	621153	06/04/20 23:05	UI	TAL SAV
	Instrument ID:	CICK								
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 02:34	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620441	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620821	06/01/20 15:26	BJB	TAL SAV
	Instrument ID:	ICPMSD								

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: SHP-2016-06B-SPR20

Lab Sample ID: 680-184215-10
Date Collected: 05/21/20 10:55
Matrix: Water
Date Received: 05/23/20 08:45

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	497612	06/05/20 07:49	JMB	TAL DEN
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 14:04	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHP-2016-06C-SPR20

Lab Sample ID: 680-184215-11
Date Collected: 05/21/20 12:55
Matrix: Water
Date Received: 05/23/20 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	621153	06/04/20 23:18	UI	TAL SAV
	Instrument ID:	CICK								
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 02:15	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620441	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620821	06/01/20 15:12	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 08:08	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 14:09	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHP-2016-4A-SPR20

Lab Sample ID: 680-184215-12
Date Collected: 05/21/20 11:25
Matrix: Water
Date Received: 05/23/20 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	621341	06/05/20 00:21	UI	TAL SAV
	Instrument ID:	CICK								
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 02:39	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620441	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620821	06/01/20 15:30	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 08:25	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 14:35	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: SHP-2016-4B-SPR20

Lab Sample ID: 680-184215-13
Date Collected: 05/21/20 10:10
Matrix: Water
Date Received: 05/23/20 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	621341	06/05/20 00:59	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 02:25	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620441	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620821	06/01/20 15:19	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 08:42	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 14:44	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHP-2016-5A-SPR20

Lab Sample ID: 680-184215-14
Date Collected: 05/21/20 15:50
Matrix: Water
Date Received: 05/23/20 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	621341	06/05/20 01:12	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	621071	06/03/20 12:06	AJR	TAL SAV
Dissolved	Analysis	6010C		1			621552	06/06/20 02:56	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	621070	06/03/20 12:06	AJR	TAL SAV
Dissolved	Analysis	6020A		1			621368	06/04/20 12:42	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 09:28	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 14:49	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHP-2016-5B-SPR20

Lab Sample ID: 680-184215-15
Date Collected: 05/21/20 15:00
Matrix: Water
Date Received: 05/23/20 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	621341	06/05/20 01:24	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620442	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 02:01	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620441	05/29/20 13:26	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620821	06/01/20 15:02	BJB	TAL SAV
	Instrument ID: ICPMSD									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

Client Sample ID: SHP-2016-5B-SPR20

Date Collected: 05/21/20 15:00
Date Received: 05/23/20 08:45

Lab Sample ID: 680-184215-15

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	497612	06/05/20 09:45	JMB	TAL DEN
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 14:54	SPG	TAL DEN
	Instrument ID:	WC-AT3								

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: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

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: JV, LTM - SHL Spring 2020

Job ID: 680-184215-1

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
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix AZ 85008
United States

BOSTON #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-1A	N1	23.70	28.70		
2	EPA-PZ-2012-1B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-1B	N1	73.56	78.56		
3	EPA-PZ-2012-2A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-2A	N1	18.14	23.14		
4	EPA-PZ-2012-2B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-2B	N1	73.16	78.16		
5	EPA-PZ-2012-3A-SPR20	WG	5-21-20	0840	GO	X	X	X	X	X	EPA-PZ-2012-3A	N1	19.09	24.09		
6	EPA-PZ-2012-3B-SPR20	WG	5-21-20	0945	GO	X	X	X	X	X	EPA-PZ-2012-3B	N1	68.70	73.70		MS/MSD Included
7	EPA-PZ-2012-4A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-4A	N1	19.56	24.56		
8	EPA-PZ-2012-4B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-4B	N1	79.50	84.50		
9	EPA-PZ-2012-5A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-5A	N1	17.95	22.95		
10	EPA-PZ-2012-5B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-5B	N1	68.46	73.46		
11	EPA-PZ-2012-6A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-6A	N1	24.19	29.19		
12	EPA-PZ-2012-6B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-6B	N1	74.23	79.23		
13	EPA-PZ-2012-7A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-7A	N1	23.87	28.87		
14	EPA-PZ-2012-7B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-7B	N1	58.82	63.82		
15	EW-01-SPR20	WG				X	X	X	X	X	EW-01	N1	60.00	85.00		
16	EW-04-SPR20	WG				X	X	X	X	X	EW-04	N1	70.00	95.00		
17	PZ-12-01-SPR20	WG				X	X	X	X	X	PZ-12-01	N1	24.00	34.00		
18	PZ-12-02-SPR20	WG				X	X	X	X	X	PZ-12-02	N1	24.00	34.00		

680-184215-01 Chain of Custody

Relinquished by: *(Signature)* Desmond Bellard
Date 05/21/20
Time 17:25
Received by: *(Signature)* 5-21-20 1725
Devens eCOCs Spring 2020

Date 5-22-20
Time 1800
Shipping Date:
Received by Laboratory: *(Signature, Date, Time)* & conditio 5-23-2020/0845
0.2/0.6, 4.0/4.4

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

Boston #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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-DUP04-SPR20	WG	5-21-20	0800	GO	X	X	X	X	X	SHP-01-38A	FD1	1.50	6.50		
38	SHL-DUP05-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-4B	FD1	79.50	84.50		
39	SHL-DUP06-SPR20	WG				X	X	X	X	X	SHM-05-40X	FD1	32.00	34.00		
40	SHM-05-40X-SPR20	WG				X	X	X	X	X	SHM-05-40X	N1	32.00	34.00		
41	SHM-05-41B-SPR20	WG	5-21-20	1530	DC	X	X	X	X	X	SHM-05-41B	N1	62.00	64.00		
42	SHM-05-41C-SPR20	WG	5-21-20	1420	DC	X	X	X	X	X	SHM-05-41C	MS1	88.00	93.00		
43	SHM-05-41C-SPR20	WG	5-21-20	1420	DC	X	X	X	X	X	SHM-05-41C	N1	88.00	93.00		
44	SHM-05-41C-SPR20	WG	5-21-20	1420	DC	X	X	X	X	X	SHM-05-41C	SD1	88.00	93.00		
45	SHM-07-03-SPR20	WG				X	X	X	X	X	SHM-07-03	N1	25.00	35.00		
46	SHM-07-05X-SPR20	WG				X	X	X	X	X	SHM-07-05X	N1	55.00	65.00		
47	SHM-11-02-SPR20	WG				X	X	X	X	X	SHM-11-02	N1	52.00	66.00		
48	SHM-11-06-SPR20	WG				X	X	X	X	X	SHM-11-06	N1	25.00	35.00		
49	SHM-13-03-SPR20	WG	5/21/20	1210	GO	X	X	X	X	X	SHM-13-03	N1	42.00	52.00		
50	SHM-13-04-SPR20	WG				X	X	X	X	X	SHM-13-04	MS1	20.00	30.00		
51	SHM-13-04-SPR20	WG				X	X	X	X	X	SHM-13-04	N1	20.00	30.00		
52	SHM-13-04-SPR20	WG				X	X	X	X	X	SHM-13-04	SD1	20.00	30.00		
53	SHM-13-06-SPR20	WG				X	X	X	X	X	SHM-13-06	N1	36.00	46.00		
54	SHM-13-07-SPR20	WG				X	X	X	X	X	SHM-13-07	N1	27.00	37.00		

680-184215-02 Chain of Custody

Relinquished by: *(Signature)* Demond Redard
Date 05/21/20
Time 17:25
Received by: *(Signature)* 5-21-20 1725
Devens eCOCs Spring 2020

Date 5-22-20 1810
Time
Shipping Date:
Received by Laboratory: *(Signature, Date, Time)* & conditio 5-23-2020/0845
0.7/0.6, 4.0/4.4

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

Boston #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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						
55	SHM-13-08-SPR20	WG				X	X	X	X	X	SHM-13-08	N1	55.00	65.00		
56	SHM-93-22B-SPR20	WG	5-21-20	1330	DB	X	X	X	X	X	SHM-93-22B	N1	82.30	92.30		
57	SHM-96-5B-SPR20	WG				X	X	X	X	X	SHM-96-5B	N1	80.00	90.00		
58	SHP-01-36X-SPR20	WG				X	X	X	X	X	SHP-01-36X	N1	3.00	8.00		
59	SHP-01-37X-SPR20	WG				X	X	X	X	X	SHP-01-37X	N1	1.00	6.00		
60	SHP-01-38A-SPR20	WG	5-21-20	1430	GO	X	X	X	X	X	SHP-01-38A	N1	1.50	6.50		
61	SHP-2016-06A-SPR20	WG	5-21-20	910	DC	X	X	X	X	X	SHP-2016-06A	N1	81.00	86.00		
62	SHP-2016-06B-SPR20	WG	5-21-20	1055	DC	X	X	X	X	X	SHP-2016-06B	N1	102.00	112.00		
63	SHP-2016-06C-SPR20	WG	5-21-20	1255	DC	X	X	X	X	X	SHP-2016-06C	N1	123.00	133.00		
64	SHP-2016-07A-SPR20	WG				X	X	X	X	X	SHP-2016-07A	N1	22.00	32.00		
65	SHP-2016-07B-SPR20	WG				X	X	X	X	X	SHP-2016-07B	N1	70.00	80.00		
66	SHP-2016-1A-SPR20	WG				X	X	X	X	X	SHP-2016-1A	N1	13.00	23.00		
67	SHP-2016-1B-SPR20	WG				X	X	X	X	X	SHP-2016-1B	N1	75.00	85.00		
68	SHP-2016-2A-SPR20	WG				X	X	X	X	X	SHP-2016-2A	N1	20.00	25.00		
69	SHP-2016-2B-SPR20	WG	~~5-21-20~~	~~1500~~	~~DB~~	X	X	X	X	X	SHP-2016-2B	N1	80.00	85.00		
70	SHP-2016-3A-SPR20	WG				X	X	X	X	X	SHP-2016-3A	N1	20.00	25.00		
71	SHP-2016-3B-SPR20	WG				X	X	X	X	X	SHP-2016-3B	N1	80.00	85.00		
72	SHP-2016-4A-SPR20	WG	5-21-20	1125	DB	X	X	X	X	X	SHP-2016-4A	N1	25.00	30.00		

680-184215-03 Chain of Custody

Relinquished by: *(Signature)* Demond Ledoro
Date 05/21/20
Time 17:25
Received by: *(Signature)* 5-21-20 1728
Devens eCOCs Spring 2020

Date 5-22-20 180
Time
Shipping Date: 5-23-2020/0845
Received by Laboratory: *(Signature, Date, Time)* & conditio 0.2/0.6, 4.0/4.4

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

Boston #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 2020					46	9	9	5	3						
73	SHP-2016-4B-SPR20	WG	5-21-20	1010	DB	X	X	X	X	X	SHP-2016-4B	N1	85.00	90.00		
74	SHP-2016-5A-SPR20	WG	5-21-20	1550	DB	X	X	X	X	X	SHP-2016-5A	N1	25.00	30.00		
75	SHP-2016-5B-SPR20	WG	5-21-20	1500	DB	X	X	X	X	X	SHP-2016-5B	N1	85.00	90.00		

Turnaround Time: NA

680-184215-04 Chain of Custody

Relinquished by: *(Signature)* Deanard Bedard
Date
Time 05/21/20 17:25
Received by: *(Signature)*
Devens eCOCs Spring 2020
5-21-20 17:25

Date
Time
Shipping Date: 5-22-20 1800
Received by Laboratory: *(Signature, Date, Time)* & conditio 5-23-2020/0845
0.2/0.6, 4.0/4.4

6/9/2020

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: 680-612328.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: kathy.smith@testamericainc.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 #: 680-184215-1
Address: 4955 Yarrow Street, .	Due Date Requested: 6/5/2020			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: JV, LTM - SHL Spring 2020	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-SPR20 (680-184215-1)	5/21/20	08:40 Eastern		Water			X	X	2	
EPA-PZ-2012-3B-SPR20 (680-184215-2)	5/21/20	09:45 Eastern		Water			X	X	2	
EPA-PZ-2012-3B-SPR20-MS (680-184215-2MS)	5/21/20	09:45 Eastern	MS	Water			X	X	2	
EPA-PZ-2012-3B-SPR20-MSD (680-184215-2MSD)	5/21/20	09:45 Eastern	MSD	Water			X	X	2	
SHL-DUP04-SPR20 (680-184215-3)	5/21/20	08:00 Eastern		Water			X	X	2	
SHM-05-41B-SPR20 (680-184215-4)	5/21/20	15:30 Eastern		Water			X	X	2	
SHM-05-41C-SPR20 (680-184215-5)	5/21/20	14:20 Eastern		Water			X	X	2	
SHM-05-41C-SPR20-MS (680-184215-5MS)	5/21/20	14:20 Eastern	MS	Water			X	X	2	
SHM-05-41C-SPR20-MSD (680-184215-5MSD)	5/21/20	14:20 Eastern	MSD	Water			X	X	2	

680-184215 Chain of Custody

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: 5-27-20 1600	Company: TA	Received by:	Date/Time: 5/28/20 0945	Company: OTADEN
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.: 1167106 / 1167107		Cooler Temperature(s) °C and Other Remarks: 1.9, 0.8, 1.8, +0.6, DS, 5/28/20		

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: 680-612328.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: kathy.smith@testamericainc.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 #: 680-184215-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 6/5/2020			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: JV, LTM - SHL Spring 2020	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-13-03-SPR20 (680-184215-6)	5/21/20	12:10 Eastern		Water			X	X	2	
SHM-93-22B-SPR20 (680-184215-7)	5/21/20	13:30 Eastern		Water			X	X	2	
SHP-01-38A-SPR20 (680-184215-8)	5/21/20	14:30 Eastern		Water			X	X	2	
SHP-2016-06A-SPR20 (680-184215-9)	5/21/20	09:10 Eastern		Water			X	X	2	
SHP-2016-06B-SPR20 (680-184215-10)	5/21/20	10:55 Eastern		Water			X	X	2	
SHP-2016-06C-SPR20 (680-184215-11)	5/21/20	12:55 Eastern		Water			X	X	2	
SHP-2016-4A-SPR20 (680-184215-12)	5/21/20	11:25 Eastern		Water			X	X	2	
SHP-2016-4B-SPR20 (680-184215-13)	5/21/20	10:10 Eastern		Water			X	X	2	
SHP-2016-5A-SPR20 (680-184215-14)	5/21/20	15:50 Eastern		Water			X	X	2	

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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: 5-27-20 1600	Company TA	Received by:		Date/Time: 5/28/20 0945	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

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: 680-612328.3
Client Contact: Shipping/Receiving	Phone:	E-Mail: kathy.smith@testamericainc.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 #: 680-184215-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 6/5/2020			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: JV, LTM - SHL Spring 2020	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-2016-5B-SPR20 (680-184215-15)	5/21/20	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:	Date/Time: 5-27-20 1600	Company TA	Received by:	Date/Time: 5/28/20 0945	Company GRADEN
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 | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-184220-1
Client Project/Site: JV, LTM - SHL Spring 2020

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Authorized for release by:
6/8/2020 10:37:42 AM
Eddie Barnett, Project Manager I
(912)250-0280
eddie.barnett@testamericainc.com

Designee for

Kathryn Smith, Client Service Manager
(912)250-0275
kathy.smith@testamericainc.com

LINKS

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Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

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.

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

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
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
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)
MQL	Method Quantitation Limit
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)

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
680-184220-1	SHM-13-08-SPR20	Water	05/22/20 11:10	05/23/20 08:45	
680-184220-2	SHM-13-07-SPR20	Water	05/22/20 09:25	05/23/20 08:45	
680-184220-3	EPA-PZ-2012-5A-SPR20	Water	05/22/20 09:50	05/23/20 08:45	
680-184220-4	EPA-PZ-2012-5B-SPR20	Water	05/22/20 11:20	05/23/20 08:45	
680-184220-5	EPA-PZ-2012-6A-SPR20	Water	05/22/20 12:00	05/23/20 08:45	
680-184220-6	EPA-PZ-2012-6B-SPR20	Water	05/22/20 09:40	05/23/20 08:45	
680-184220-7	EPA-PZ-2012-7A-SPR20	Water	05/22/20 13:30	05/23/20 08:45	
680-184220-8	EPA-PZ-2012-7B-SPR20	Water	05/22/20 15:15	05/23/20 08:45	

Job ID: 680-184220-1

Laboratory: Eurofins TestAmerica, Savannah

Narrative

CASE NARRATIVE
Client: Seres Engineering & Services LLC
Project: JV, LTM - SHL Spring 2020

Report Number: 680-184220-1

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 05/23/2020; the samples arrived in good condition, properly preserved and on ice. The temperature of the cooler at receipt was 5.0º C.

METALS (ICP) - DISSOLVED
Samples SHM-13-08-SPR20 (680-184220-1), SHM-13-07-SPR20 (680-184220-2), EPA-PZ-2012-5A-SPR20 (680-184220-3), EPA-PZ-2012-5B-SPR20 (680-184220-4), EPA-PZ-2012-6A-SPR20 (680-184220-5), EPA-PZ-2012-6B-SPR20 (680-184220-6), EPA-PZ-2012-7A-SPR20 (680-184220-7) and EPA-PZ-2012-7B-SPR20 (680-184220-8) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 06/02/2020 and 06/03/2020 and analyzed on 06/03/2020 and 06/06/2020.

Iron was detected in method blank MB 680-620848/1-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. Manganese was detected in method blank MB 680-621071/1-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.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICPMS) - DISSOLVED
Samples SHM-13-08-SPR20 (680-184220-1), SHM-13-07-SPR20 (680-184220-2), EPA-PZ-2012-5A-SPR20 (680-184220-3), EPA-PZ-2012-5B-SPR20 (680-184220-4), EPA-PZ-2012-6A-SPR20 (680-184220-5), EPA-PZ-2012-6B-SPR20 (680-184220-6), EPA-PZ-2012-7A-SPR20 (680-184220-7) and EPA-PZ-2012-7B-SPR20 (680-184220-8) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 06/02/2020 and 06/03/2020 and analyzed on 06/03/2020 and 06/04/2020.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ALKALINITY
Samples SHM-13-08-SPR20 (680-184220-1), SHM-13-07-SPR20 (680-184220-2), EPA-PZ-2012-5A-SPR20 (680-184220-3), EPA-PZ-2012-5B-SPR20 (680-184220-4), EPA-PZ-2012-6A-SPR20 (680-184220-5), EPA-PZ-2012-6B-SPR20 (680-184220-6), EPA-PZ-2012-7A-SPR20 (680-184220-7) and EPA-PZ-2012-7B-SPR20 (680-184220-8) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 05/29/2020.

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-13-08-SPR20 (680-184220-1), SHM-13-07-SPR20 (680-184220-2), EPA-PZ-2012-5A-SPR20 (680-184220-3), EPA-PZ-2012-5B-SPR20 (680-184220-4), EPA-PZ-2012-6A-SPR20 (680-184220-5), EPA-PZ-2012-6B-SPR20 (680-184220-6), EPA-PZ-2012-7A-SPR20 (680-184220-7) and EPA-PZ-2012-7B-SPR20 (680-184220-8) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 06/05/2020.

Job ID: 680-184220-1 (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.

TOTAL ORGANIC CARBON (TOC)

Samples SHM-13-08-SPR20 (680-184220-1), SHM-13-07-SPR20 (680-184220-2), EPA-PZ-2012-5A-SPR20 (680-184220-3), EPA-PZ-2012-5B-SPR20 (680-184220-4), EPA-PZ-2012-6A-SPR20 (680-184220-5), EPA-PZ-2012-6B-SPR20 (680-184220-6), EPA-PZ-2012-7A-SPR20 (680-184220-7) and EPA-PZ-2012-7B-SPR20 (680-184220-8) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 06/05/2020.

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: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

Client Sample ID: SHM-13-08-SPR20

Lab Sample ID: 680-184220-1

Date Collected: 05/22/20 11:10
Date Received: 05/23/20 08:45

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	17		0.50	0.20	mg/L			06/05/20 01:37	1
Sulfate	2.8		1.0	0.40	mg/L			06/05/20 01:37	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	19000		50	17	ug/L		06/03/20 12:06	06/06/20 02:28	1
Manganese	410	B	10	1.0	ug/L		06/03/20 12:06	06/06/20 02:28	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	630		3.0	1.5	ug/L		06/03/20 12:06	06/04/20 12:39	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	110		10	3.1	mg/L			05/29/20 15:40	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			06/05/20 10:02	1

Client Sample ID: SHM-13-07-SPR20

Lab Sample ID: 680-184220-2

Date Collected: 05/22/20 09:25
Date Received: 05/23/20 08:45

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	96		0.50	0.20	mg/L			06/05/20 01:50	1
Sulfate	7.5		1.0	0.40	mg/L			06/05/20 01:50	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	12000		50	17	ug/L		06/02/20 10:20	06/03/20 01:27	1
Manganese	2500		10	1.0	ug/L		06/02/20 10:20	06/03/20 01:27	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	400		3.0	1.5	ug/L		06/02/20 10:20	06/03/20 12:56	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	72		10	3.1	mg/L			05/29/20 15:45	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			06/05/20 10:19	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

Client Sample ID: EPA-PZ-2012-5A-SPR20

Lab Sample ID: 680-184220-3

Date Collected: 05/22/20 09:50
Date Received: 05/23/20 08:45

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	15		0.50	0.20	mg/L			06/05/20 02:02	1
Sulfate	4.0		1.0	0.40	mg/L			06/05/20 02:02	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	6700		50	17	ug/L		06/02/20 10:20	06/03/20 01:22	1
Manganese	88		10	1.0	ug/L		06/02/20 10:20	06/03/20 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		06/02/20 10:20	06/03/20 12:53	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	26		10	3.1	mg/L			05/29/20 15:49	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	6.7		1.0	0.35	mg/L			06/05/20 10:35	1

Client Sample ID: EPA-PZ-2012-5B-SPR20

Lab Sample ID: 680-184220-4

Date Collected: 05/22/20 11:20
Date Received: 05/23/20 08:45

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	37		0.50	0.20	mg/L			06/05/20 02:28	1
Sulfate	10		1.0	0.40	mg/L			06/05/20 02:28	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	300		50	17	ug/L		06/02/20 10:20	06/03/20 01:36	1
Manganese	9600		10	1.0	ug/L		06/02/20 10:20	06/03/20 01:36	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		06/02/20 10:20	06/03/20 13:30	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	190		10	3.1	mg/L			05/29/20 15:54	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			06/05/20 10:52	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

Client Sample ID: EPA-PZ-2012-6A-SPR20

Lab Sample ID: 680-184220-5

Date Collected: 05/22/20 12:00
Date Received: 05/23/20 08:45

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3.3		0.50	0.20	mg/L			06/05/20 02:41	1
Sulfate	2.8		1.0	0.40	mg/L			06/05/20 02:41	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		06/02/20 10:20	06/03/20 01:31	1
Manganese	1.0	U	10	1.0	ug/L		06/02/20 10:20	06/03/20 01:31	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		06/02/20 10:20	06/03/20 13:26	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	37		10	3.1	mg/L			05/29/20 15:58	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	0.71	J	1.0	0.35	mg/L			06/05/20 11:41	1

Client Sample ID: EPA-PZ-2012-6B-SPR20

Lab Sample ID: 680-184220-6

Date Collected: 05/22/20 09:40
Date Received: 05/23/20 08:45

Matrix: Water

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			06/05/20 02:53	1
Sulfate	3.5		1.0	0.40	mg/L			06/05/20 02:53	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	14000		50	17	ug/L		06/02/20 10:20	06/03/20 01:45	1
Manganese	720		10	1.0	ug/L		06/02/20 10:20	06/03/20 01:45	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	220		3.0	1.5	ug/L		06/02/20 10:20	06/03/20 13:37	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	36		10	3.1	mg/L			05/29/20 16:02	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			06/05/20 11:57	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

Client Sample ID: EPA-PZ-2012-7A-SPR20

Lab Sample ID: 680-184220-7

Date Collected: 05/22/20 13:30
Date Received: 05/23/20 08:45

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	160		0.50	0.20	mg/L			06/05/20 03:06	1
Sulfate	3.0		1.0	0.40	mg/L			06/05/20 03:06	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		06/03/20 12:06	06/06/20 03:00	1
Manganese	10	B	10	1.0	ug/L		06/03/20 12:06	06/06/20 03:00	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		06/03/20 12:06	06/04/20 12:44	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	18		10	3.1	mg/L			05/29/20 16:07	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	0.96	J	1.0	0.35	mg/L			06/05/20 12:46	1

Client Sample ID: EPA-PZ-2012-7B-SPR20

Lab Sample ID: 680-184220-8

Date Collected: 05/22/20 15:15
Date Received: 05/23/20 08:45

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.2		0.50	0.20	mg/L			06/05/20 03:18	1
Sulfate	3.3		1.0	0.40	mg/L			06/05/20 03:18	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	16000		50	17	ug/L		06/02/20 10:20	06/03/20 01:41	1
Manganese	2700		10	1.0	ug/L		06/02/20 10:20	06/03/20 01:41	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		06/02/20 10:20	06/03/20 13:33	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	38		10	3.1	mg/L			05/29/20 16:11	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			06/05/20 13:03	1

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 680-621341/131 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621341

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.20	U	0.50	0.20	mg/L			06/04/20 23:43	1
Sulfate	0.40	U M	1.0	0.40	mg/L			06/04/20 23:43	1

Lab Sample ID: LCS 680-621341/132 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621341

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	10.1		mg/L		101	87 - 112

Lab Sample ID: LCSD 680-621341/133 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621341

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.87		mg/L		99	87 - 111	0	15
Sulfate	10.0	10.3		mg/L		103	87 - 112	1	15

Lab Sample ID: MB 680-621342/2 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621342

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.20	U	0.50	0.20	mg/L			06/04/20 21:43	1
Sulfate	0.40	U	1.0	0.40	mg/L			06/04/20 21:43	1

Lab Sample ID: LCS 680-621342/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621342

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.29		mg/L		93	87 - 111
Sulfate	10.0	9.63		mg/L		96	87 - 112

Lab Sample ID: LCSD 680-621342/4 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 621342

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.29		mg/L		93	87 - 111	0	15
Sulfate	10.0	9.64		mg/L		96	87 - 112	0	15

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-620848/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 621030 — **Prep Batch: 620848**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	19.6	J	50	17	ug/L		06/02/20 10:20	06/03/20 00:26	1
Manganese	1.0	U	10	1.0	ug/L		06/02/20 10:20	06/03/20 00:26	1

Lab Sample ID: LCS 680-620848/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 621030 — **Prep Batch: 620848**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5010	4830		ug/L		96	87 - 115
Manganese	400	382		ug/L		96	90 - 114

Lab Sample ID: MB 680-621071/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 621552 — **Prep Batch: 621071**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		06/03/20 12:06	06/06/20 01:46	1
Manganese	8.57	J	10	1.0	ug/L		06/03/20 12:06	06/06/20 01:46	1

Lab Sample ID: LCS 680-621071/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 621552 — **Prep Batch: 621071**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5010	4730		ug/L		94	87 - 115
Manganese	400	394		ug/L		98	90 - 114

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-620847/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 621115 — **Prep Batch: 620847**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.5	U	3.0	1.5	ug/L		06/02/20 10:20	06/03/20 11:38	1

Lab Sample ID: LCS 680-620847/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 621115 — **Prep Batch: 620847**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	112		ug/L		112	84 - 116

Lab Sample ID: MB 680-621070/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 621368 — **Prep Batch: 621070**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.5	U	3.0	1.5	ug/L		06/03/20 12:06	06/04/20 14:23	1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 680-621070/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 621368 — **Prep Batch: 621070**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	105		ug/L		105	84 - 116

Method: 9060A - Organic Carbon, Dissolved (DOC)

Lab Sample ID: MB 280-497612/54 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

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			06/05/20 06:33	1

Lab Sample ID: LCS 280-497612/53 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	25.0	26.8		mg/L		107	88 - 112

Lab Sample ID: 680-184220-4 MS — **Client Sample ID: EPA-PZ-2012-5B-SPR20**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	1.4		25.0	28.4		mg/L		108	88 - 112

Lab Sample ID: 680-184220-4 MSD — **Client Sample ID: EPA-PZ-2012-5B-SPR20**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497612

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Organic Carbon	1.4		25.0	28.3		mg/L		108	88 - 112	0	15

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 280-496866/31 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 496866

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	3.1	U	10	3.1	mg/L			05/29/20 14:30	1

Lab Sample ID: LCS 280-496866/30 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 496866

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	200	205		mg/L		103	89 - 109

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

HPLC/IC

Analysis Batch: 621341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184220-1	SHM-13-08-SPR20	Total/NA	Water	9056A	
680-184220-2	SHM-13-07-SPR20	Total/NA	Water	9056A	
680-184220-3	EPA-PZ-2012-5A-SPR20	Total/NA	Water	9056A	
MB 680-621341/131	Method Blank	Total/NA	Water	9056A	
LCS 680-621341/132	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-621341/133	Lab Control Sample Dup	Total/NA	Water	9056A	

Analysis Batch: 621342

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184220-4	EPA-PZ-2012-5B-SPR20	Total/NA	Water	9056A	
680-184220-5	EPA-PZ-2012-6A-SPR20	Total/NA	Water	9056A	
680-184220-6	EPA-PZ-2012-6B-SPR20	Total/NA	Water	9056A	
680-184220-7	EPA-PZ-2012-7A-SPR20	Total/NA	Water	9056A	
680-184220-8	EPA-PZ-2012-7B-SPR20	Total/NA	Water	9056A	
MB 680-621342/2	Method Blank	Total/NA	Water	9056A	
LCS 680-621342/3	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-621342/4	Lab Control Sample Dup	Total/NA	Water	9056A	

Metals

Prep Batch: 620847

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184220-2	SHM-13-07-SPR20	Dissolved	Water	3005A	
680-184220-3	EPA-PZ-2012-5A-SPR20	Dissolved	Water	3005A	
680-184220-4	EPA-PZ-2012-5B-SPR20	Dissolved	Water	3005A	
680-184220-5	EPA-PZ-2012-6A-SPR20	Dissolved	Water	3005A	
680-184220-6	EPA-PZ-2012-6B-SPR20	Dissolved	Water	3005A	
680-184220-8	EPA-PZ-2012-7B-SPR20	Dissolved	Water	3005A	
MB 680-620847/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-620847/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 620848

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184220-2	SHM-13-07-SPR20	Dissolved	Water	3005A	
680-184220-3	EPA-PZ-2012-5A-SPR20	Dissolved	Water	3005A	
680-184220-4	EPA-PZ-2012-5B-SPR20	Dissolved	Water	3005A	
680-184220-5	EPA-PZ-2012-6A-SPR20	Dissolved	Water	3005A	
680-184220-6	EPA-PZ-2012-6B-SPR20	Dissolved	Water	3005A	
680-184220-8	EPA-PZ-2012-7B-SPR20	Dissolved	Water	3005A	
MB 680-620848/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-620848/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 621030

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184220-2	SHM-13-07-SPR20	Dissolved	Water	6010C	620848
680-184220-3	EPA-PZ-2012-5A-SPR20	Dissolved	Water	6010C	620848
680-184220-4	EPA-PZ-2012-5B-SPR20	Dissolved	Water	6010C	620848
680-184220-5	EPA-PZ-2012-6A-SPR20	Dissolved	Water	6010C	620848
680-184220-6	EPA-PZ-2012-6B-SPR20	Dissolved	Water	6010C	620848
680-184220-8	EPA-PZ-2012-7B-SPR20	Dissolved	Water	6010C	620848
MB 680-620848/1-A	Method Blank	Total Recoverable	Water	6010C	620848

Metals (Continued)

Analysis Batch: 621030 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 680-620848/2-A	Lab Control Sample	Total Recoverable	Water	6010C	620848

Prep Batch: 621070

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184220-1	SHM-13-08-SPR20	Dissolved	Water	3005A	
680-184220-7	EPA-PZ-2012-7A-SPR20	Dissolved	Water	3005A	
MB 680-621070/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-621070/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 621071

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184220-1	SHM-13-08-SPR20	Dissolved	Water	3005A	
680-184220-7	EPA-PZ-2012-7A-SPR20	Dissolved	Water	3005A	
MB 680-621071/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-621071/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 621115

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184220-2	SHM-13-07-SPR20	Dissolved	Water	6020A	620847
680-184220-3	EPA-PZ-2012-5A-SPR20	Dissolved	Water	6020A	620847
680-184220-4	EPA-PZ-2012-5B-SPR20	Dissolved	Water	6020A	620847
680-184220-5	EPA-PZ-2012-6A-SPR20	Dissolved	Water	6020A	620847
680-184220-6	EPA-PZ-2012-6B-SPR20	Dissolved	Water	6020A	620847
680-184220-8	EPA-PZ-2012-7B-SPR20	Dissolved	Water	6020A	620847
MB 680-620847/1-A	Method Blank	Total Recoverable	Water	6020A	620847
LCS 680-620847/2-A	Lab Control Sample	Total Recoverable	Water	6020A	620847

Analysis Batch: 621368

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184220-1	SHM-13-08-SPR20	Dissolved	Water	6020A	621070
680-184220-7	EPA-PZ-2012-7A-SPR20	Dissolved	Water	6020A	621070
MB 680-621070/1-A	Method Blank	Total Recoverable	Water	6020A	621070
LCS 680-621070/2-A	Lab Control Sample	Total Recoverable	Water	6020A	621070

Analysis Batch: 621552

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184220-1	SHM-13-08-SPR20	Dissolved	Water	6010C	621071
680-184220-7	EPA-PZ-2012-7A-SPR20	Dissolved	Water	6010C	621071
MB 680-621071/1-A	Method Blank	Total Recoverable	Water	6010C	621071
LCS 680-621071/2-A	Lab Control Sample	Total Recoverable	Water	6010C	621071

General Chemistry

Analysis Batch: 496866

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184220-1	SHM-13-08-SPR20	Total/NA	Water	SM 2320B	
680-184220-2	SHM-13-07-SPR20	Total/NA	Water	SM 2320B	
680-184220-3	EPA-PZ-2012-5A-SPR20	Total/NA	Water	SM 2320B	
680-184220-4	EPA-PZ-2012-5B-SPR20	Total/NA	Water	SM 2320B	
680-184220-5	EPA-PZ-2012-6A-SPR20	Total/NA	Water	SM 2320B	
680-184220-6	EPA-PZ-2012-6B-SPR20	Total/NA	Water	SM 2320B	

General Chemistry (Continued)

Analysis Batch: 496866 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184220-7	EPA-PZ-2012-7A-SPR20	Total/NA	Water	SM 2320B	
680-184220-8	EPA-PZ-2012-7B-SPR20	Total/NA	Water	SM 2320B	
MB 280-496866/31	Method Blank	Total/NA	Water	SM 2320B	
LCS 280-496866/30	Lab Control Sample	Total/NA	Water	SM 2320B	

Analysis Batch: 497612

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184220-1	SHM-13-08-SPR20	Dissolved	Water	9060A	
680-184220-2	SHM-13-07-SPR20	Dissolved	Water	9060A	
680-184220-3	EPA-PZ-2012-5A-SPR20	Dissolved	Water	9060A	
680-184220-4	EPA-PZ-2012-5B-SPR20	Dissolved	Water	9060A	
680-184220-5	EPA-PZ-2012-6A-SPR20	Dissolved	Water	9060A	
680-184220-6	EPA-PZ-2012-6B-SPR20	Dissolved	Water	9060A	
680-184220-7	EPA-PZ-2012-7A-SPR20	Dissolved	Water	9060A	
680-184220-8	EPA-PZ-2012-7B-SPR20	Dissolved	Water	9060A	
MB 280-497612/54	Method Blank	Dissolved	Water	9060A	
LCS 280-497612/53	Lab Control Sample	Dissolved	Water	9060A	
680-184220-4 MS	EPA-PZ-2012-5B-SPR20	Dissolved	Water	9060A	
680-184220-4 MSD	EPA-PZ-2012-5B-SPR20	Dissolved	Water	9060A	

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

Client Sample ID: SHM-13-08-SPR20

Lab Sample ID: 680-184220-1

Date Collected: 05/22/20 11:10

Matrix: Water

Date Received: 05/23/20 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	621341	06/05/20 01:37	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	621071	06/03/20 12:06	AJR	TAL SAV
Dissolved	Analysis	6010C		1			621552	06/06/20 02:28	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	621070	06/03/20 12:06	AJR	TAL SAV
Dissolved	Analysis	6020A		1			621368	06/04/20 12:39	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 10:02	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 15:40	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHM-13-07-SPR20

Lab Sample ID: 680-184220-2

Date Collected: 05/22/20 09:25

Matrix: Water

Date Received: 05/23/20 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	621341	06/05/20 01:50	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620848	06/02/20 10:20	AJR	TAL SAV
Dissolved	Analysis	6010C		1			621030	06/03/20 01:27	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620847	06/02/20 10:20	AJR	TAL SAV
Dissolved	Analysis	6020A		1			621115	06/03/20 12:56	BWR	TAL SAV
	Instrument ID: ICPMSC									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 10:19	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 15:45	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: EPA-PZ-2012-5A-SPR20

Lab Sample ID: 680-184220-3

Date Collected: 05/22/20 09:50

Matrix: Water

Date Received: 05/23/20 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	621341	06/05/20 02:02	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	620848	06/02/20 10:20	AJR	TAL SAV
Dissolved	Analysis	6010C		1			621030	06/03/20 01:22	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620847	06/02/20 10:20	AJR	TAL SAV
Dissolved	Analysis	6020A		1			621115	06/03/20 12:53	BWR	TAL SAV
	Instrument ID: ICPMSC									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

Client Sample ID: EPA-PZ-2012-5A-SPR20

Lab Sample ID: 680-184220-3

Date Collected: 05/22/20 09:50
Date Received: 05/23/20 08:45

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	497612	06/05/20 10:35	JMB	TAL DEN
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 15:49	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: EPA-PZ-2012-5B-SPR20

Lab Sample ID: 680-184220-4

Date Collected: 05/22/20 11:20
Date Received: 05/23/20 08:45

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	621342	06/05/20 02:28	UI	TAL SAV
	Instrument ID:	CICL								
Dissolved	Prep	3005A			50 mL	50 mL	620848	06/02/20 10:20	AJR	TAL SAV
Dissolved	Analysis	6010C		1			621030	06/03/20 01:36	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620847	06/02/20 10:20	AJR	TAL SAV
Dissolved	Analysis	6020A		1			621115	06/03/20 13:30	BWR	TAL SAV
	Instrument ID:	ICPMSC								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 10:52	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 15:54	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: EPA-PZ-2012-6A-SPR20

Lab Sample ID: 680-184220-5

Date Collected: 05/22/20 12:00
Date Received: 05/23/20 08:45

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	621342	06/05/20 02:41	UI	TAL SAV
	Instrument ID:	CICL								
Dissolved	Prep	3005A			50 mL	50 mL	620848	06/02/20 10:20	AJR	TAL SAV
Dissolved	Analysis	6010C		1			621030	06/03/20 01:31	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620847	06/02/20 10:20	AJR	TAL SAV
Dissolved	Analysis	6020A		1			621115	06/03/20 13:26	BWR	TAL SAV
	Instrument ID:	ICPMSC								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 11:41	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 15:58	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

Client Sample ID: EPA-PZ-2012-6B-SPR20 — Lab Sample ID: 680-184220-6

Date Collected: 05/22/20 09:40
Date Received: 05/23/20 08:45
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	621342	06/05/20 02:53	UI	TAL SAV
	Instrument ID: CICL									
Dissolved	Prep	3005A			50 mL	50 mL	620848	06/02/20 10:20	AJR	TAL SAV
Dissolved	Analysis	6010C		1			621030	06/03/20 01:45	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620847	06/02/20 10:20	AJR	TAL SAV
Dissolved	Analysis	6020A		1			621115	06/03/20 13:37	BWR	TAL SAV
	Instrument ID: ICPMSC									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 11:57	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 16:02	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: EPA-PZ-2012-7A-SPR20 — Lab Sample ID: 680-184220-7

Date Collected: 05/22/20 13:30
Date Received: 05/23/20 08:45
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	621342	06/05/20 03:06	UI	TAL SAV
	Instrument ID: CICL									
Dissolved	Prep	3005A			50 mL	50 mL	621071	06/03/20 12:06	AJR	TAL SAV
Dissolved	Analysis	6010C		1			621552	06/06/20 03:00	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	621070	06/03/20 12:06	AJR	TAL SAV
Dissolved	Analysis	6020A		1			621368	06/04/20 12:44	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497612	06/05/20 12:46	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 16:07	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: EPA-PZ-2012-7B-SPR20 — Lab Sample ID: 680-184220-8

Date Collected: 05/22/20 15:15
Date Received: 05/23/20 08:45
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	621342	06/05/20 03:18	UI	TAL SAV
	Instrument ID: CICL									
Dissolved	Prep	3005A			50 mL	50 mL	620848	06/02/20 10:20	AJR	TAL SAV
Dissolved	Analysis	6010C		1			621030	06/03/20 01:41	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	620847	06/02/20 10:20	AJR	TAL SAV
Dissolved	Analysis	6020A		1			621115	06/03/20 13:33	BWR	TAL SAV
	Instrument ID: ICPMSC									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

Client Sample ID: EPA-PZ-2012-7B-SPR20

Lab Sample ID: 680-184220-8

Date Collected: 05/22/20 15:15

Matrix: Water

Date Received: 05/23/20 08:45

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	497612	06/05/20 13:03	JMB	TAL DEN
Total/NA	Analysis	SM 2320B		1			496866	05/29/20 16:11	SPG	TAL DEN
	Instrument ID:	WC-AT3								

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: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

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: JV, LTM - SHL Spring 2020

Job ID: 680-184220-1

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
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

Boston #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins/Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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						
55	SHM-13-08-SPR20	WG	5-22-20	1110	DC	X	X	X	X	X	SHM-13-08	N1	55.00	65.00		
56	SHM-93-22B-SPR20	WG				X	X	X	X	X	SHM-93-22B	N1	82.30	92.30		
57	SHM-96-5B-SPR20	WG				X	X	X	X	X	SHM-96-5B	N1	80.00	90.00		
58	SHP-01-36X-SPR20	WG				X	X	X	X	X	SHP-01-36X	N1	3.00	8.00		
59	SHP-01-37X-SPR20	WG				X	X	X	X	X	SHP-01-37X	N1	1.00	6.00		
60	SHP-01-38A-SPR20	WG				X	X	X	X	X	SHP-01-38A	N1	1.50	6.50		
61	SHP-2016-06A-SPR20	WG				X	X	X	X	X	SHP-2016-06A	N1	81.00	86.00		
62	SHP-2016-06B-SPR20	WG				X	X	X	X	X	SHP-2016-06B	N1	102.00	112.00		
63	SHP-2016-06C-SPR20	WG				X	X	X	X	X	SHP-2016-06C	N1	123.00	133.00		
64	SHP-2016-07A-SPR20	WG				X	X	X	X	X	SHP-2016-07A	N1	22.00	32.00		
65	SHP-2016-07B-SPR20	WG				X	X	X	X	X	SHP-2016-07B	N1	70.00	80.00		
66	SHP-2016-1A-SPR20	WG				X	X	X	X	X	SHP-2016-1A	N1	13.00	23.00		
67	SHP-2016-1B-SPR20	WG				X	X	X	X	X	SHP-2016-1B	N1	75.00	85.00		
68	SHP-2016-2A-SPR20	WG				X	X	X	X	X	SHP-2016-2A	N1	20.00	25.00		
69	SHP-2016-2B-SPR20	WG				X	X	X	X	X	SHP-2016-2B	N1	80.00	85.00		
70	SHP-2016-3A-SPR20	WG				X	X	X	X	X	SHP-2016-3A	N1	20.00	25.00		
71	SHP-2016-3B-SPR20	WG				X	X	X	X	X	SHP-2016-3B	N1	80.00	85.00		
72	SHP-2016-4A-SPR20	WG				X	X	X	X	X	SHP-2016-4A	N1	25.00	30.00		

680-184220-01 Chain of Custody

Relinquished by: *(Signature)* Bernard Bedard
Date
Time 05/22/20 16:40
Received by: *(Signature)* Cory
Devens eCOCs Spring 2020

Date 5-22-20
Time 1640
Shipping Date Cory 5-22-20 1600
Received by Laboratory: *(Signature, Date, Time)* & conditio 5-23-2020/0845 4.6/5.0

6/8/2020

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

#215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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-DUP04-SPR20	WG				X	X	X	X	X	SHP-01-38A	FD1	1.50	6.50		
38	SHL-DUP05-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-4B	FD1	79.50	84.50		
39	SHL-DUP06-SPR20	WG				X	X	X	X	X	SHM-05-40X	FD1	32.00	34.00		
40	SHM-05-40X-SPR20	WG				X	X	X	X	X	SHM-05-40X	N1	32.00	34.00		
41	SHM-05-41B-SPR20	WG				X	X	X	X	X	SHM-05-41B	N1	62.00	64.00		
42	SHM-05-41C-SPR20	WG				X	X	X	X	X	SHM-05-41C	MS1	88.00	93.00		
43	SHM-05-41C-SPR20	WG				X	X	X	X	X	SHM-05-41C	N1	88.00	93.00		
44	SHM-05-41C-SPR20	WG				X	X	X	X	X	SHM-05-41C	SD1	88.00	93.00		
45	SHM-07-03-SPR20	WG				X	X	X	X	X	SHM-07-03	N1	25.00	35.00		
46	SHM-07-05X-SPR20	WG				X	X	X	X	X	SHM-07-05X	N1	55.00	65.00		
47	SHM-11-02-SPR20	WG				X	X	X	X	X	SHM-11-02	N1	52.00	66.00		
48	SHM-11-06-SPR20	WG				X	X	X	X	X	SHM-11-06	N1	25.00	35.00		
49	SHM-13-03-SPR20	WG				X	X	X	X	X	SHM-13-03	N1	42.00	52.00		
50	SHM-13-04-SPR20	WG				X	X	X	X	X	SHM-13-04	MS1	20.00	30.00		
51	SHM-13-04-SPR20	WG				X	X	X	X	X	SHM-13-04	N1	20.00	30.00		
52	SHM-13-04-SPR20	WG				X	X	X	X	X	SHM-13-04	SD1	20.00	30.00		
53	SHM-13-06-SPR20	WG				X	X	X	X	X	SHM-13-06	N1	36.00	46.00		
54	SHM-13-07-SPR20	WG	5.22.20	925	PC	X	X	X	X	X	SHM-13-07	N1	27.00	37.00		

680-184220-02 Chain of Custody

Relinquished by: *(Signature)* Bernard Kedard
Date 05/22/20
Time 16:40
Received by: *(Signature)* 5.22.20 1640
Devens eCOCs Spring 2020

Date 5.22.20
Time 1100
Shipping Date:
Received by Laboratory: *(Signature, Date, Time)* & conditio 5-23-2020/0845 4/6/5C

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

Boston #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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

	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: JV, Long Term Monitoring, SHL, Spring 2020					46	9	9	5	3						
1	EPA-PZ-2012-1A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-1A	N1	23.70	28.70		
2	EPA-PZ-2012-1B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-1B	N1	73.56	78.56		
3	EPA-PZ-2012-2A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-2A	N1	18.14	23.14		
4	EPA-PZ-2012-2B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-2B	N1	73.16	78.16		
5	EPA-PZ-2012-3A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-3A	N1	19.09	24.09		
6	EPA-PZ-2012-3B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-3B	N1	68.70	73.70		
7	EPA-PZ-2012-4A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-4A	N1	19.56	24.56		
8	EPA-PZ-2012-4B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-4B	N1	79.50	84.50		
9	EPA-PZ-2012-5A-SPR20	WG	5-22-20	950	GO	X	X	X	X	X	EPA-PZ-2012-5A	N1	17.95	22.95		
10	EPA-PZ-2012-5B-SPR20	WG	5-22-20	1120	GO	X	X	X	X	X	EPA-PZ-2012-5B	N1	68.46	73.46		
11	EPA-PZ-2012-6A-SPR20	WG	5-22-20	1200	DB	X	X	X	X	X	EPA-PZ-2012-6A	N1	24.19	29.19		
12	EPA-PZ-2012-6B-SPR20	WG	5-22-20	940	DB	X	X	X	X	X	EPA-PZ-2012-6B	N1	74.23	79.23		
13	EPA-PZ-2012-7A-SPR20	WG	5-22-20	1330	DB	X	X	X	X	X	EPA-PZ-2012-7A	N1	23.87	28.87		
14	EPA-PZ-2012-7B-SPR20	WG	5-22-20	1515	DB	X	X	X	X	X	EPA-PZ-2012-7B	N1	58.82	63.82		
15	EW-01-SPR20	WG				X	X	X	X	X	EW-01	N1	60.00	85.00		
16	EW-04-SPR20	WG				X	X	X	X	X	EW-04	N1	70.00	95.00		
17	PZ-12-01-SPR20	WG				X	X	X	X	X	PZ-12-01	N1	24.00	34.00		
18	PZ-12-02-SPR20	WG				X	X	X	X	X	PZ-12-02	N1	24.00	34.00		

680-184220-03 Chain of Custody

Relinquished by: *(Signature)* Demand Bedard
Date 05/22/20
Time 16:40
Received by: *(Signature)* [signature] 5-22-20 1640
Devens eCOCs Spring 2020

Date
Time
Shipping Date: [signature] 5-22-20 1640
Received by Laboratory: *(Signature, Date, Time)* & conditio [signature] 5-23-2020/0845 4.6/5.0

6/8/2020

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: 680-612328.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: kathy.smith@testamericainc.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 #: 680-184220-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 6/5/2020			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: JV, LTM - SHL Spring 2020	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-13-08-SPR20 (680-184220-1)	5/22/20	11:10 Eastern		Water			X	X	2	
SHM-13-07-SPR20 (680-184220-2)	5/22/20	09:25 Eastern		Water			X	X	2	
EPA-PZ-2012-5A-SPR20 (680-184220-3)	5/22/20	09:50 Eastern		Water			X	X	2	
EPA-PZ-2012-5B-SPR20 (680-184220-4)	5/22/20	11:20 Eastern		Water			X	X	2	
EPA-PZ-2012-6A-SPR20 (680-184220-5)	5/22/20	12:00 Eastern		Water			X	X	2	
EPA-PZ-2012-6B-SPR20 (680-184220-6)	5/22/20	09:40 Eastern		Water			X	X	2	
EPA-PZ-2012-7A-SPR20 (680-184220-7)	5/22/20	13:30 Eastern		Water			X	X	2	
EPA-PZ-2012-7B-SPR20 (680-184220-8)	5/22/20	15:15 Eastern		Water			X	X	2	

680-184220 Chain of Custody

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: 5-27-20 1600	Company TA	Received by:	Date/Time: 5/28/20 0945	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.: 1167106 / 1167107		Cooler Temperature(s) °C and Other Remarks: 1.9, 0.8, IR8, +0.6, DS, 5/28/20		

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-184220-1

Login Number: 184220

List Source: Eurofins TestAmerica, Savannah

List Number: 1

Creator: Mooken, Darmal

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: 680-184220-1

Login Number: 184220
List Number: 2
Creator: Schade, Daniel B

List Source: Eurofins TestAmerica, Denver
List Creation: 05/28/20 11:47 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.	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.	True	
Residual Chlorine Checked.	True	

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-183926-1
Client Project/Site: JV, LTM - SHL Spring 2020

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

Authorized for release by:
6/4/2020 12:43:25 PM

Kathryn Smith, Client Service Manager
(912)250-0275
kathy.smith@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.

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

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
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
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)
MQL	Method Quantitation Limit
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)

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
680-183926-1	PZ-12-02-SPR20	Water	05/15/20 15:10	05/16/20 09:00	
680-183926-2	PZ-12-07-SPR20	Water	05/15/20 14:00	05/16/20 09:00	
680-183926-3	PZ-12-09-SPR20	Water	05/15/20 11:55	05/16/20 09:00	
680-183926-4	PZ-12-10-SPR20	Water	05/15/20 10:05	05/16/20 09:00	
680-183926-5	SHM-07-03-SPR20	Water	05/15/20 15:15	05/16/20 09:00	
680-183926-6	SHP-2016-07B-SPR20	Water	05/15/20 09:30	05/16/20 09:00	
680-183926-7	SHP-2016-1A-SPR20	Water	05/15/20 12:00	05/16/20 09:00	

Job ID: 680-183926-1

Laboratory: Eurofins TestAmerica, Savannah

Narrative

CASE NARRATIVE
Client: Seres Engineering & Services LLC
Project: JV, LTM - SHL Spring 2020

Report Number: 680-183926-1

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 05/16/2020; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.5 C.

METALS (ICP) - DISSOLVED
Samples PZ-12-02-SPR20 (680-183926-1), PZ-12-07-SPR20 (680-183926-2), PZ-12-09-SPR20 (680-183926-3), PZ-12-10-SPR20 (680-183926-4), SHM-07-03-SPR20 (680-183926-5), SHP-2016-07B-SPR20 (680-183926-6) and SHP-2016-1A-SPR20 (680-183926-7) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/19/2020 and 05/20/2020 and analyzed on 05/20/2020 and 05/21/2020.

Manganese was detected in method blank MB 680-619231/1-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.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICPMS) - DISSOLVED
Samples PZ-12-02-SPR20 (680-183926-1), PZ-12-07-SPR20 (680-183926-2), PZ-12-09-SPR20 (680-183926-3), PZ-12-10-SPR20 (680-183926-4), SHM-07-03-SPR20 (680-183926-5), SHP-2016-07B-SPR20 (680-183926-6) and SHP-2016-1A-SPR20 (680-183926-7) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 05/19/2020 and 05/20/2020 and analyzed on 05/21/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ALKALINITY
Samples PZ-12-02-SPR20 (680-183926-1), PZ-12-07-SPR20 (680-183926-2), PZ-12-09-SPR20 (680-183926-3), PZ-12-10-SPR20 (680-183926-4), SHM-07-03-SPR20 (680-183926-5), SHP-2016-07B-SPR20 (680-183926-6) and SHP-2016-1A-SPR20 (680-183926-7) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 05/21/2020.

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-12-02-SPR20 (680-183926-1), PZ-12-07-SPR20 (680-183926-2), PZ-12-09-SPR20 (680-183926-3), PZ-12-10-SPR20 (680-183926-4), SHM-07-03-SPR20 (680-183926-5), SHP-2016-07B-SPR20 (680-183926-6) and SHP-2016-1A-SPR20 (680-183926-7) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 05/23/2020, 05/24/2020 and 05/26/2020.

Sample PZ-12-02-SPR20 (680-183926-1)[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.

Job ID: 680-183926-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

TOTAL ORGANIC CARBON (TOC)

Samples PZ-12-02-SPR20 (680-183926-1), PZ-12-07-SPR20 (680-183926-2), PZ-12-09-SPR20 (680-183926-3), PZ-12-10-SPR20 (680-183926-4), SHM-07-03-SPR20 (680-183926-5), SHP-2016-07B-SPR20 (680-183926-6) and SHP-2016-1A-SPR20 (680-183926-7) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 06/02/2020 and 06/03/2020.

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: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

Client Sample ID: PZ-12-02-SPR20

Lab Sample ID: 680-183926-1
Date Collected: 05/15/20 15:10
Matrix: Water
Date Received: 05/16/20 09:00

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	54		2.5	1.0	mg/L			05/26/20 22:47	5
Sulfate	2.0	U M	5.0	2.0	mg/L			05/26/20 22:47	5

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	74000		50	17	ug/L		05/20/20 13:17	05/21/20 23:22	1
Manganese	1400		10	1.0	ug/L		05/20/20 13:17	05/21/20 23:22	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		05/20/20 13:17	05/21/20 16:02	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	260		10	3.1	mg/L			05/21/20 10:23	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			06/03/20 04:19	1

Client Sample ID: PZ-12-07-SPR20

Lab Sample ID: 680-183926-2
Date Collected: 05/15/20 14:00
Matrix: Water
Date Received: 05/16/20 09:00

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.3		0.50	0.20	mg/L			05/24/20 03:57	1
Sulfate	32		1.0	0.40	mg/L			05/24/20 03:57	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	3500		50	17	ug/L		05/20/20 13:17	05/21/20 23:17	1
Manganese	1000		10	1.0	ug/L		05/20/20 13:17	05/21/20 23:17	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	70		3.0	1.5	ug/L		05/20/20 13:17	05/21/20 15:59	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	85		10	3.1	mg/L			05/21/20 10:27	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			06/03/20 04:37	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

Client Sample ID: PZ-12-09-SPR20

Lab Sample ID: 680-183926-3
Date Collected: 05/15/20 11:55
Matrix: Water
Date Received: 05/16/20 09:00

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			05/23/20 17:50	1
Sulfate	13		1.0	0.40	mg/L			05/23/20 17:50	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		05/20/20 13:17	05/21/20 22:54	1
Manganese	17		10	1.0	ug/L		05/20/20 13:17	05/21/20 22:54	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		05/20/20 13:17	05/21/20 15:45	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	84		10	3.1	mg/L			05/21/20 10:32	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	0.52	J	1.0	0.35	mg/L			06/02/20 20:07	1

Client Sample ID: PZ-12-10-SPR20

Lab Sample ID: 680-183926-4
Date Collected: 05/15/20 10:05
Matrix: Water
Date Received: 05/16/20 09:00

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.46	J	0.50	0.20	mg/L			05/23/20 20:51	1
Sulfate	7.2		1.0	0.40	mg/L			05/23/20 20:51	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		05/19/20 12:38	05/20/20 22:53	1
Manganese	1.5	J	10	1.0	ug/L		05/19/20 12:38	05/20/20 22:53	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		05/19/20 12:38	05/21/20 11:32	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	33		10	3.1	mg/L			05/21/20 10:36	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	0.64	J	1.0	0.35	mg/L			06/03/20 05:30	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

Client Sample ID: SHM-07-03-SPR20

Lab Sample ID: 680-183926-5
Date Collected: 05/15/20 15:15
Matrix: Water
Date Received: 05/16/20 09:00

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	130		0.50	0.20	mg/L			05/24/20 04:10	1
Sulfate	6.1		1.0	0.40	mg/L			05/24/20 04:10	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	110		50	17	ug/L		05/19/20 12:38	05/20/20 23:41	1
Manganese	26		10	1.0	ug/L		05/19/20 12:38	05/20/20 23:41	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		05/19/20 12:38	05/21/20 11:52	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	25		10	3.1	mg/L			05/21/20 10:40	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			06/03/20 06:16	1

Client Sample ID: SHP-2016-07B-SPR20

Lab Sample ID: 680-183926-6
Date Collected: 05/15/20 09:30
Matrix: Water
Date Received: 05/16/20 09:00

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			05/24/20 04:23	1
Sulfate	34		1.0	0.40	mg/L			05/24/20 04:23	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	110		50	17	ug/L		05/19/20 12:38	05/21/20 00:03	1
Manganese	470		10	1.0	ug/L		05/19/20 12:38	05/21/20 00:03	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	57		3.0	1.5	ug/L		05/19/20 12:38	05/21/20 12:00	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	130		10	3.1	mg/L			05/21/20 11:00	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			06/03/20 06:33	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

Client Sample ID: SHP-2016-1A-SPR20

Lab Sample ID: 680-183926-7

Date Collected: 05/15/20 12:00
Date Received: 05/16/20 09:00

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**0.55**		0.50	0.20	mg/L			05/24/20 04:36	1
Sulfate	**3.2**		1.0	0.40	mg/L			05/24/20 04:36	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		05/19/20 12:38	05/20/20 23:36	1
Manganese	**2.3**	**J**	10	1.0	ug/L		05/19/20 12:38	05/20/20 23:36	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		05/19/20 12:38	05/21/20 11:49	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**17**		10	3.1	mg/L			05/21/20 10:54	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	**0.65**	**J**	1.0	0.35	mg/L			06/03/20 06:50	1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 680-619807/2 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 619807

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.20	U	0.50	0.20	mg/L			05/23/20 15:28	1
Sulfate	0.40	U	1.0	0.40	mg/L			05/23/20 15:28	1

Lab Sample ID: LCS 680-619807/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 619807

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	10.3		mg/L		103	87 - 112

Lab Sample ID: LCSD 680-619807/4 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 619807

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	10.3		mg/L		103	87 - 112	0	15

Lab Sample ID: 680-183926-3 MS — **Client Sample ID: PZ-12-09-SPR20 MS**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 619807

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	1.1		10.0	11.1		mg/L		100	87 - 111
Sulfate	13		10.0	23.1		mg/L		102	87 - 112

Lab Sample ID: 680-183926-3 MSD — **Client Sample ID: PZ-12-09-SPR20 MSD**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 619807

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		101	87 - 111	1	15
Sulfate	13		10.0	23.2		mg/L		103	87 - 112	0	15

Lab Sample ID: 680-183926-4 MS — **Client Sample ID: PZ-12-10-SPR20 MS**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 619807

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	0.46	J	10.0	10.4		mg/L		100	87 - 111
Sulfate	7.2		10.0	17.3		mg/L		102	87 - 112

Lab Sample ID: 680-183926-4 MSD — **Client Sample ID: PZ-12-10-SPR20 MSD**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 619807

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	0.46	J	10.0	10.5		mg/L		100	87 - 111	1	15
Sulfate	7.2		10.0	17.4		mg/L		103	87 - 112	0	15

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 680-619811/33
Matrix: Water
Analysis Batch: 619811

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			05/23/20 23:39	1
Sulfate	0.40	U	1.0	0.40	mg/L			05/23/20 23:39	1

Lab Sample ID: LCS 680-619811/34
Matrix: Water
Analysis Batch: 619811

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	9.86		mg/L		99	87 - 112

Lab Sample ID: LCSD 680-619811/35
Matrix: Water
Analysis Batch: 619811

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	9.89		mg/L		99	87 - 112	0	15

Lab Sample ID: MB 680-619964/33
Matrix: Water
Analysis Batch: 619964

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			05/26/20 21:29	1
Sulfate	0.40	U	1.0	0.40	mg/L			05/26/20 21:29	1

Lab Sample ID: LCS 680-619964/34
Matrix: Water
Analysis Batch: 619964

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	9.69		mg/L		97	87 - 112

Lab Sample ID: LCSD 680-619964/35
Matrix: Water
Analysis Batch: 619964

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	9.76		mg/L		98	87 - 112	1	15

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-619231/1-A
Matrix: Water
Analysis Batch: 619543

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 619231

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		05/19/20 12:38	05/20/20 22:42	1
Manganese	1.21	J	10	1.0	ug/L		05/19/20 12:38	05/20/20 22:42	1

Lab Sample ID: LCS 680-619231/2-A
Matrix: Water
Analysis Batch: 619543

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 619231

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5010	4880		ug/L		97	87 - 115
Manganese	400	439		ug/L		110	90 - 114

Lab Sample ID: MB 680-619384/1-A
Matrix: Water
Analysis Batch: 619647

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 619384

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		05/20/20 13:17	05/21/20 22:36	1
Manganese	1.0	U	10	1.0	ug/L		05/20/20 13:17	05/21/20 22:36	1

Lab Sample ID: LCS 680-619384/2-A
Matrix: Water
Analysis Batch: 619647

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 619384

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5010	4930		ug/L		98	87 - 115
Manganese	400	397		ug/L		99	90 - 114

Lab Sample ID: 680-183926-4 MS
Matrix: Water
Analysis Batch: 619543

Client Sample ID: PZ-12-10-SPR20 MS
Prep Type: Dissolved
Prep Batch: 619231

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	17	U	5010	5000		ug/L		100	87 - 115
Manganese	1.5	J	400	398		ug/L		99	90 - 114

Lab Sample ID: 680-183926-4 MSD
Matrix: Water
Analysis Batch: 619543

Client Sample ID: PZ-12-10-SPR20 MSD
Prep Type: Dissolved
Prep Batch: 619231

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron	17	U	5010	4980		ug/L		99	87 - 115	0	20
Manganese	1.5	J	400	397		ug/L		99	90 - 114	0	20

Lab Sample ID: 680-183926-3 MS
Matrix: Water
Analysis Batch: 619647

Client Sample ID: PZ-12-09-SPR20 MS
Prep Type: Dissolved
Prep Batch: 619384

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	17	U	5010	5030		ug/L		100	87 - 115
Manganese	17		400	420		ug/L		101	90 - 114

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

Method: 6010C - Metals (ICP)

Lab Sample ID: 680-183926-3 MSD — **Client Sample ID: PZ-12-09-SPR20 MSD**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 619647 — **Prep Batch: 619384**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron	17	U	5010	4930		ug/L		98	87 - 115	2	20
Manganese	17		400	410		ug/L		98	90 - 114	3	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-619227/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 619636 — **Prep Batch: 619227**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.5	U	3.0	1.5	ug/L		05/19/20 12:38	05/21/20 11:26	1

Lab Sample ID: LCS 680-619227/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 619636 — **Prep Batch: 619227**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	96.2		ug/L		96	84 - 116

Lab Sample ID: MB 680-619383/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 619636 — **Prep Batch: 619383**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.5	U	3.0	1.5	ug/L		05/20/20 13:17	05/21/20 15:40	1

Lab Sample ID: LCS 680-619383/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 619636 — **Prep Batch: 619383**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	96.0		ug/L		96	84 - 116

Lab Sample ID: 680-183926-4 MS — **Client Sample ID: PZ-12-10-SPR20 MS**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 619636 — **Prep Batch: 619227**

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: 680-183926-4 MSD — **Client Sample ID: PZ-12-10-SPR20 MSD**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 619636 — **Prep Batch: 619227**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	1.5	U	100	98.1		ug/L		98	84 - 116	5	20

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 680-183926-3 MS — **Client Sample ID: PZ-12-09-SPR20 MS**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 619636 — **Prep Batch: 619383**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.5	U	100	108		ug/L		108	84 - 116

Lab Sample ID: 680-183926-3 MSD — **Client Sample ID: PZ-12-09-SPR20 MSD**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 619636 — **Prep Batch: 619383**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	1.5	U	100	114		ug/L		114	84 - 116	6	20

Method: 9060A - Organic Carbon, Dissolved (DOC)

Lab Sample ID: MB 280-497282/35 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

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			06/03/20 00:23	1

Lab Sample ID: MB 280-497282/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

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			06/02/20 15:49	1

Lab Sample ID: LCS 280-497282/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	25.0	25.9		mg/L		104	88 - 112

Lab Sample ID: LCS 280-497282/34 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	25.0	26.9		mg/L		107	88 - 112

Lab Sample ID: 680-183926-3 MS — **Client Sample ID: PZ-12-09-SPR20 MS**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	0.52	J	25.0	27.0		mg/L		106	88 - 112

Method: 9060A - Organic Carbon, Dissolved (DOC) (Continued)

Lab Sample ID: 680-183926-3 MSD — **Client Sample ID: PZ-12-09-SPR20 MSD**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Organic Carbon	0.52	J	25.0	26.6		mg/L		104	88 - 112	2	15

Lab Sample ID: 680-183926-4 MS — **Client Sample ID: PZ-12-10-SPR20 MS**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	0.64	J	25.0	27.5		mg/L		107	88 - 112

Lab Sample ID: 680-183926-4 MSD — **Client Sample ID: PZ-12-10-SPR20 MSD**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Organic Carbon	0.64	J	25.0	27.6		mg/L		108	88 - 112	1	15

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 280-495774/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 495774

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	3.1	U	10	3.1	mg/L			05/21/20 09:44	1

Lab Sample ID: LCS 280-495774/4 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 495774

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	200	213		mg/L		107	89 - 109

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

HPLC/IC

Analysis Batch: 619807

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183926-3	PZ-12-09-SPR20	Total/NA	Water	9056A	
680-183926-4	PZ-12-10-SPR20	Total/NA	Water	9056A	
MB 680-619807/2	Method Blank	Total/NA	Water	9056A	
LCS 680-619807/3	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-619807/4	Lab Control Sample Dup	Total/NA	Water	9056A	
680-183926-3 MS	PZ-12-09-SPR20 MS	Total/NA	Water	9056A	
680-183926-3 MSD	PZ-12-09-SPR20 MSD	Total/NA	Water	9056A	
680-183926-4 MS	PZ-12-10-SPR20 MS	Total/NA	Water	9056A	
680-183926-4 MSD	PZ-12-10-SPR20 MSD	Total/NA	Water	9056A	

Analysis Batch: 619811

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183926-2	PZ-12-07-SPR20	Total/NA	Water	9056A	
680-183926-5	SHM-07-03-SPR20	Total/NA	Water	9056A	
680-183926-6	SHP-2016-07B-SPR20	Total/NA	Water	9056A	
680-183926-7	SHP-2016-1A-SPR20	Total/NA	Water	9056A	
MB 680-619811/33	Method Blank	Total/NA	Water	9056A	
LCS 680-619811/34	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-619811/35	Lab Control Sample Dup	Total/NA	Water	9056A	

Analysis Batch: 619964

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183926-1	PZ-12-02-SPR20	Total/NA	Water	9056A	
MB 680-619964/33	Method Blank	Total/NA	Water	9056A	
LCS 680-619964/34	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-619964/35	Lab Control Sample Dup	Total/NA	Water	9056A	

Metals

Prep Batch: 619227

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183926-4	PZ-12-10-SPR20	Dissolved	Water	3005A	
680-183926-5	SHM-07-03-SPR20	Dissolved	Water	3005A	
680-183926-6	SHP-2016-07B-SPR20	Dissolved	Water	3005A	
680-183926-7	SHP-2016-1A-SPR20	Dissolved	Water	3005A	
MB 680-619227/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-619227/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-183926-4 MS	PZ-12-10-SPR20 MS	Dissolved	Water	3005A	
680-183926-4 MSD	PZ-12-10-SPR20 MSD	Dissolved	Water	3005A	

Prep Batch: 619231

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183926-4	PZ-12-10-SPR20	Dissolved	Water	3005A	
680-183926-5	SHM-07-03-SPR20	Dissolved	Water	3005A	
680-183926-6	SHP-2016-07B-SPR20	Dissolved	Water	3005A	
680-183926-7	SHP-2016-1A-SPR20	Dissolved	Water	3005A	
MB 680-619231/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-619231/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-183926-4 MS	PZ-12-10-SPR20 MS	Dissolved	Water	3005A	
680-183926-4 MSD	PZ-12-10-SPR20 MSD	Dissolved	Water	3005A	

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

Metals

Prep Batch: 619383

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183926-1	PZ-12-02-SPR20	Dissolved	Water	3005A	
680-183926-2	PZ-12-07-SPR20	Dissolved	Water	3005A	
680-183926-3	PZ-12-09-SPR20	Dissolved	Water	3005A	
MB 680-619383/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-619383/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-183926-3 MS	PZ-12-09-SPR20 MS	Dissolved	Water	3005A	
680-183926-3 MSD	PZ-12-09-SPR20 MSD	Dissolved	Water	3005A	

Prep Batch: 619384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183926-1	PZ-12-02-SPR20	Dissolved	Water	3005A	
680-183926-2	PZ-12-07-SPR20	Dissolved	Water	3005A	
680-183926-3	PZ-12-09-SPR20	Dissolved	Water	3005A	
MB 680-619384/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-619384/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-183926-3 MS	PZ-12-09-SPR20 MS	Dissolved	Water	3005A	
680-183926-3 MSD	PZ-12-09-SPR20 MSD	Dissolved	Water	3005A	

Analysis Batch: 619543

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183926-4	PZ-12-10-SPR20	Dissolved	Water	6010C	619231
680-183926-5	SHM-07-03-SPR20	Dissolved	Water	6010C	619231
680-183926-6	SHP-2016-07B-SPR20	Dissolved	Water	6010C	619231
680-183926-7	SHP-2016-1A-SPR20	Dissolved	Water	6010C	619231
MB 680-619231/1-A	Method Blank	Total Recoverable	Water	6010C	619231
LCS 680-619231/2-A	Lab Control Sample	Total Recoverable	Water	6010C	619231
680-183926-4 MS	PZ-12-10-SPR20 MS	Dissolved	Water	6010C	619231
680-183926-4 MSD	PZ-12-10-SPR20 MSD	Dissolved	Water	6010C	619231

Analysis Batch: 619636

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183926-1	PZ-12-02-SPR20	Dissolved	Water	6020A	619383
680-183926-2	PZ-12-07-SPR20	Dissolved	Water	6020A	619383
680-183926-3	PZ-12-09-SPR20	Dissolved	Water	6020A	619383
680-183926-4	PZ-12-10-SPR20	Dissolved	Water	6020A	619227
680-183926-5	SHM-07-03-SPR20	Dissolved	Water	6020A	619227
680-183926-6	SHP-2016-07B-SPR20	Dissolved	Water	6020A	619227
680-183926-7	SHP-2016-1A-SPR20	Dissolved	Water	6020A	619227
MB 680-619227/1-A	Method Blank	Total Recoverable	Water	6020A	619227
MB 680-619383/1-A	Method Blank	Total Recoverable	Water	6020A	619383
LCS 680-619227/2-A	Lab Control Sample	Total Recoverable	Water	6020A	619227
LCS 680-619383/2-A	Lab Control Sample	Total Recoverable	Water	6020A	619383
680-183926-3 MS	PZ-12-09-SPR20 MS	Dissolved	Water	6020A	619383
680-183926-3 MSD	PZ-12-09-SPR20 MSD	Dissolved	Water	6020A	619383
680-183926-4 MS	PZ-12-10-SPR20 MS	Dissolved	Water	6020A	619227
680-183926-4 MSD	PZ-12-10-SPR20 MSD	Dissolved	Water	6020A	619227

Analysis Batch: 619647

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183926-1	PZ-12-02-SPR20	Dissolved	Water	6010C	619384
680-183926-2	PZ-12-07-SPR20	Dissolved	Water	6010C	619384

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

Metals (Continued)

Analysis Batch: 619647 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183926-3	PZ-12-09-SPR20	Dissolved	Water	6010C	619384
MB 680-619384/1-A	Method Blank	Total Recoverable	Water	6010C	619384
LCS 680-619384/2-A	Lab Control Sample	Total Recoverable	Water	6010C	619384
680-183926-3 MS	PZ-12-09-SPR20 MS	Dissolved	Water	6010C	619384
680-183926-3 MSD	PZ-12-09-SPR20 MSD	Dissolved	Water	6010C	619384

General Chemistry

Analysis Batch: 495774

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183926-1	PZ-12-02-SPR20	Total/NA	Water	SM 2320B	
680-183926-2	PZ-12-07-SPR20	Total/NA	Water	SM 2320B	
680-183926-3	PZ-12-09-SPR20	Total/NA	Water	SM 2320B	
680-183926-4	PZ-12-10-SPR20	Total/NA	Water	SM 2320B	
680-183926-5	SHM-07-03-SPR20	Total/NA	Water	SM 2320B	
680-183926-6	SHP-2016-07B-SPR20	Total/NA	Water	SM 2320B	
680-183926-7	SHP-2016-1A-SPR20	Total/NA	Water	SM 2320B	
MB 280-495774/5	Method Blank	Total/NA	Water	SM 2320B	
LCS 280-495774/4	Lab Control Sample	Total/NA	Water	SM 2320B	

Analysis Batch: 497282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183926-1	PZ-12-02-SPR20	Dissolved	Water	9060A	
680-183926-2	PZ-12-07-SPR20	Dissolved	Water	9060A	
680-183926-3	PZ-12-09-SPR20	Dissolved	Water	9060A	
680-183926-4	PZ-12-10-SPR20	Dissolved	Water	9060A	
680-183926-5	SHM-07-03-SPR20	Dissolved	Water	9060A	
680-183926-6	SHP-2016-07B-SPR20	Dissolved	Water	9060A	
680-183926-7	SHP-2016-1A-SPR20	Dissolved	Water	9060A	
MB 280-497282/35	Method Blank	Dissolved	Water	9060A	
MB 280-497282/4	Method Blank	Dissolved	Water	9060A	
LCS 280-497282/3	Lab Control Sample	Dissolved	Water	9060A	
LCS 280-497282/34	Lab Control Sample	Dissolved	Water	9060A	
680-183926-3 MS	PZ-12-09-SPR20 MS	Dissolved	Water	9060A	
680-183926-3 MSD	PZ-12-09-SPR20 MSD	Dissolved	Water	9060A	
680-183926-4 MS	PZ-12-10-SPR20 MS	Dissolved	Water	9060A	
680-183926-4 MSD	PZ-12-10-SPR20 MSD	Dissolved	Water	9060A	

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

Client Sample ID: PZ-12-02-SPR20

Lab Sample ID: 680-183926-1
Matrix: Water
Date Collected: 05/15/20 15:10
Date Received: 05/16/20 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	5 mL	5 mL	619964	05/26/20 22:47	UI	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619384	05/20/20 13:17	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619647	05/21/20 23:22	BWR	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619383	05/20/20 13:17	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 16:02	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/03/20 04:19	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 10:23	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: PZ-12-07-SPR20

Lab Sample ID: 680-183926-2
Matrix: Water
Date Collected: 05/15/20 14:00
Date Received: 05/16/20 09:00

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	619811	05/24/20 03:57	UI	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619384	05/20/20 13:17	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619647	05/21/20 23:17	BWR	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619383	05/20/20 13:17	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 15:59	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/03/20 04:37	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 10:27	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: PZ-12-09-SPR20

Lab Sample ID: 680-183926-3
Matrix: Water
Date Collected: 05/15/20 11:55
Date Received: 05/16/20 09:00

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	619807	05/23/20 17:50	UI	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619384	05/20/20 13:17	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619647	05/21/20 22:54	BWR	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619383	05/20/20 13:17	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 15:45	BJB	TAL SAV
	Instrument ID: ICPMSD									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

Client Sample ID: PZ-12-09-SPR20

Lab Sample ID: 680-183926-3
Date Collected: 05/15/20 11:55
Matrix: Water
Date Received: 05/16/20 09:00

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	497282	06/02/20 20:07	JMB	TAL DEN
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 10:32	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: PZ-12-10-SPR20

Lab Sample ID: 680-183926-4
Date Collected: 05/15/20 10:05
Matrix: Water
Date Received: 05/16/20 09:00

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	619807	05/23/20 20:51	UI	TAL SAV
	Instrument ID:	CICH								
Dissolved	Prep	3005A			50 mL	50 mL	619231	05/19/20 12:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619543	05/20/20 22:53	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	619227	05/19/20 12:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 11:32	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/03/20 05:30	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 10:36	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHM-07-03-SPR20

Lab Sample ID: 680-183926-5
Date Collected: 05/15/20 15:15
Matrix: Water
Date Received: 05/16/20 09:00

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	619811	05/24/20 04:10	UI	TAL SAV
	Instrument ID:	CICH								
Dissolved	Prep	3005A			50 mL	50 mL	619231	05/19/20 12:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619543	05/20/20 23:41	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	619227	05/19/20 12:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 11:52	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/03/20 06:16	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 10:40	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

Client Sample ID: SHP-2016-07B-SPR20

Lab Sample ID: 680-183926-6

Date Collected: 05/15/20 09:30
Matrix: Water
Date Received: 05/16/20 09:00

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	619811	05/24/20 04:23	UI	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619231	05/19/20 12:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619543	05/21/20 00:03	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619227	05/19/20 12:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 12:00	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/03/20 06:33	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 11:00	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHP-2016-1A-SPR20

Lab Sample ID: 680-183926-7

Date Collected: 05/15/20 12:00
Matrix: Water
Date Received: 05/16/20 09:00

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	619811	05/24/20 04:36	UI	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619231	05/19/20 12:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619543	05/20/20 23:36	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619227	05/19/20 12:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 11:49	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/03/20 06:50	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 10:54	SPG	TAL DEN
	Instrument ID: WC-AT3									

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: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

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: JV, LTM - SHL Spring 2020

Job ID: 680-183926-1

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
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

Boston #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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-SPR20~~	WG				X	X	X	X	X	EPA-PZ-2012-1A	N1	23.70	28.70		
2	~~EPA-PZ-2012-1B-SPR20~~	WG				X	X	X	X	X	EPA-PZ-2012-1B	N1	73.56	78.56		
3	~~EPA-PZ-2012-2A-SPR20~~	WG				X	X	X	X	X	EPA-PZ-2012-2A	N1	18.14	23.14		
4	~~EPA-PZ-2012-2B-SPR20~~	WG				X	X	X	X	X	EPA-PZ-2012-2B	N1	73.16	78.16		
5	~~EPA-PZ-2012-3A-SPR20~~	WG				X	X	X	X	X	EPA-PZ-2012-3A	N1	19.09	24.09		
6	~~EPA-PZ-2012-3B-SPR20~~	WG				X	X	X	X	X	EPA-PZ-2012-3B	N1	68.70	73.70		
7	~~EPA-PZ-2012-4A-SPR20~~	WG				X	X	X	X	X	EPA-PZ-2012-4A	N1	19.56	24.56		
8	~~EPA-PZ-2012-4B-SPR20~~	WG				X	X	X	X	X	EPA-PZ-2012-4B	N1	79.50	84.50		
9	~~EPA-PZ-2012-5A-SPR20~~	WG				X	X	X	X	X	EPA-PZ-2012-5A	N1	17.95	22.95		
10	~~EPA-PZ-2012-5B-SPR20~~	WG				X	X	X	X	X	EPA-PZ-2012-5B	N1	68.46	73.46		
11	~~EPA-PZ-2012-6A-SPR20~~	WG				X	X	X	X	X	EPA-PZ-2012-6A	N1	24.19	29.19		
12	~~EPA-PZ-2012-6B-SPR20~~	WG				X	X	X	X	X	EPA-PZ-2012-6B	N1	74.23	79.23		
13	~~EPA-PZ-2012-7A-SPR20~~	WG				X	X	X	X	X	EPA-PZ-2012-7A	N1	23.87	28.87		
14	~~EPA-PZ-2012-7B-SPR20~~	WG				X	X	X	X	X	EPA-PZ-2012-7B	N1	58.82	63.82		
15	~~EW-01-SPR20~~	WG				X	X	X	X	X	EW-01	N1	60.00	85.00		
16	~~EW-04-SPR20~~	WG				X	X	X	X	X	EW-04	N1	70.00	95.00		
17	~~PZ-12-01-SPR20~~	WG				X	X	X	X	X	PZ-12-01	N1	24.00	34.00		
18	PZ-12-02-SPR20	WG	5-15-20	1510	DC	X	X	X	X	X	PZ-12-02	N1	24.00	34.00		

680-183926-01 Chain of Custody

Relinquished by: *(Signature)* D Richard
Date 05/15/20
Time 17:00
Received by: *(Signature)* CEM 5-15-20 1700
Devens eCOCs Spring 2020

Date Corey 5-15-20 1800
Time
Shipping Date:
Received by Laboratory: ***(Signature, Date, Time)*** & conditio 5/16/2020 0900 1.1/1.5

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

Boston #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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

680-183926-02 Chain of Custody

Event: JV, Long Term Monitoring, SHL, Spring 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-12-03-SPR20~~	WG				X	X	X	X	X	PZ-12-03	N1	24.00	34.00		
20	~~PZ-12-04-SPR20~~	WG				X	X	X	X	X	PZ-12-04	N1	24.00	34.00		
21	~~PZ-12-05-SPR20~~	WG				X	X	X	X	X	PZ-12-05	N1	26.00	36.00		
22	~~PZ-12-06-SPR20~~	WG				X	X	X	X	X	PZ-12-06	N1	25.00	35.00		
23	PZ-12-07-SPR20	WG	5-15-20	1400	DC	X	X	X	X	X	PZ-12-07	N1	20.00	30.00		
24	~~PZ-12-08-SPR20~~	WG				X	X	X	X	X	PZ-12-08	N1	22.00	32.00		
25	PZ-12-09-SPR20	WG	5-15-20	1155	DC	X	X	X	X	X	PZ-12-09	MS1	20.00	30.00		
26	PZ-12-09-SPR20	WG	5-15-20	1155	DC	X	X	X	X	X	PZ-12-09	N1	20.00	30.00		
27	PZ-12-09-SPR20	WG	5-15-20	1155	DC	X	X	X	X	X	PZ-12-09	SD1	20.00	30.00		MS/MSD
28	PZ-12-10-SPR20	WG	5-15-20	1005	DC	X	X	X	X	X	PZ-12-10	N1	20.00	30.00		MS/MSD
29	~~SHL-10-SPR20~~	WG				X	X	X	X	X	SHL-10	N1	24.00	39.00		
30	~~SHL-11-SPR20~~	WG				X	X	X	X	X	SHL-11	N1	12.00	27.00		
31	~~SHL-19-SPR20~~	WG				X	X	X	X	X	SHL-19	N1	20.00	30.00		
32	~~SHL-20-SPR20~~	WG				X	X	X	X	X	SHL-20	N1	39.00	49.00		
33	~~SHL-4-SPR20~~	WG				X	X	X	X	X	SHL-4	N1	3.00	13.00		
34	~~SHL-DUP01-SPR20~~	WG				X	X	X	X	X	PZ-12-06	FD1	25.00	35.00		
35	~~SHL-DUP02-SPR20~~	WG				X	X	X	X	X	SHL-20	FD1	39.00	49.00		
36	~~SHL-DUP03-SPR20~~	WG				X	X	X	X	X	SHM-11-06	FD1	25.00	35.00		

Relinquished by: *(Signature)* D Bedard
Date 05/15/20
Time 17:00
Received by: *(Signature)* Cem 5-17-20-1700
Devens eCOCs Spring 2020

Date Corey 5-15-20 1800
Time
Shipping Date:
Received by Laboratory: *(Signature, Date, Time)* & conditio Pa 5/16/2020 0900 1.1/1.5

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

Bostor #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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

680-183926-03 Chain of Custody

Event: JV, Long Term Monitoring, SHL, Spring 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-DUP04-SPR20~~	WG				X	X	X	X	X						SHP-01-38A	FD1	1.50	6.50		
38	~~SHL-DUP05-SPR20~~	WG				X	X	X	X	X						EPA-PZ-2012-4B	FD1	79.50	84.50		
39	~~SHL-DUP06-SPR20~~	WG				X	X	X	X	X						SHM-05-40X	FD1	32.00	34.00		
40	~~SHM-05-40X-SPR20~~	WG				X	X	X	X	X						SHM-05-40X	N1	32.00	34.00		
41	~~SHM-05-41B-SPR20~~	WG				X	X	X	X	X						SHM-05-41B	N1	62.00	64.00		
42	~~SHM-05-41C-SPR20~~	WG				X	X	X	X	X						SHM-05-41C	MS1	88.00	93.00		
43	~~SHM-05-41C-SPR20~~	WG				X	X	X	X	X						SHM-05-41C	N1	88.00	93.00		
44	~~SHM-05-41C-SPR20~~	WG				X	X	X	X	X						SHM-05-41C	SD1	88.00	93.00		
45	~~[illegible]~~ SHM-07-03-SPR20	WG	5-15-20	1515	DB	X	X	X	X	X						SHM-07-03	N1	25.00	35.00		
46	~~SHM-07-05X-SPR20~~	WG				X	X	X	X	X						SHM-07-05X	N1	55.00	65.00		
47	~~SHM-11-02-SPR20~~	WG				X	X	X	X	X						SHM-11-02	N1	52.00	66.00		
48	~~SHM-11-06-SPR20~~	WG				X	X	X	X	X						SHM-11-06	N1	25.00	35.00		
49	~~SHM-13-03-SPR20~~	WG				X	X	X	X	X						SHM-13-03	N1	42.00	52.00		
50	~~SHM-13-04-SPR20~~	WG				X	X	X	X	X						SHM-13-04	MS1	20.00	30.00		
51	~~SHM-13-04-SPR20~~	WG				X	X	X	X	X						SHM-13-04	N1	20.00	30.00		
52	~~SHM-13-04-SPR20~~	WG				X	X	X	X	X						SHM-13-04	SD1	20.00	30.00		
53	~~SHM-13-06-SPR20~~	WG				X	X	X	X	X						SHM-13-06	N1	36.00	46.00		
54	~~SHM-13-07-SPR20~~	WG				X	X	X	X	X						SHM-13-07	N1	27.00	37.00		

Relinquished by: *(Signature)* [illegible]
Date 05/15/20
Time 17:00
Received by: *(Signature)* [illegible] 5-15-20-1700
Devens eCOCs Spring 2020

Date [illegible] 5-15-20 1500
Time
Shipping Date:
Received by Laboratory: *(Signature, Date, Time)* & conditio [illegible] 5/14/2020 0900 1.1/1.5

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

COC # SHL_5.14.202

ARCADIS

Boston #215

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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

680-183926-04 Chain of Custody

Event: JV, Long Term Monitoring, SHL, Spring 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						
55	SHM-13-08-SPR20	WG				X	X	X	X	X	SHM-13-08	N1	55.00	65.00		
56	SHM-93-22B-SPR20	WG				X	X	X	X	X	SHM-93-22B	N1	82.30	92.30		
57	SHM-96-5B-SPR20	WG				X	X	X	X	X	SHM-96-5B	N1	80.00	90.00		
58	SHP-01-36X-SPR20	WG				X	X	X	X	X	SHP-01-36X	N1	3.00	8.00		
59	SHP-01-37X-SPR20	WG				X	X	X	X	X	SHP-01-37X	N1	1.00	6.00		
60	SHP-01-38A-SPR20	WG				X	X	X	X	X	SHP-01-38A	N1	1.50	6.50		
61	SHP-2016-06A-SPR20	WG				X	X	X	X	X	SHP-2016-06A	N1	81.00	86.00		
62	SHP-2016-06B-SPR20	WG				X	X	X	X	X	SHP-2016-06B	N1	102.00	112.00		
63	SHP-2016-06C-SPR20	WG				X	X	X	X	X	SHP-2016-06C	N1	123.00	133.00		
64	SHP-2016-07A-SPR20	WG				X	X	X	X	X	SHP-2016-07A	N1	22.00	32.00		
65	SHP-2016-07B-SPR20	WG	5-15-20	930	GO	X	X	X	X	X	SHP-2016-07B	N1	70.00	80.00		
66	SHP-2016-1A-SPR20	WG	5-15-20	1200	GO	X	X	X	X	X	SHP-2016-1A	N1	13.00	23.00		
67	SHP-2016-1B-SPR20	WG				X	X	X	X	X	SHP-2016-1B	N1	75.00	85.00		
68	SHP-2016-2A-SPR20	WG				X	X	X	X	X	SHP-2016-2A	N1	20.00	25.00		
69	SHP-2016-2B-SPR20	WG				X	X	X	X	X	SHP-2016-2B	N1	80.00	85.00		
70	SHP-2016-3A-SPR20	WG				X	X	X	X	X	SHP-2016-3A	N1	20.00	25.00		
71	SHP-2016-3B-SPR20	WG				X	X	X	X	X	SHP-2016-3B	N1	80.00	85.00		
72	SHP-2016-4A-SPR20	WG				X	X	X	X	X	SHP-2016-4A	N1	25.00	30.00		

Relinquished by: (Signature) [signature]
Date 05/15/20
Time 17:00
Received by: (Signature) [signature] 5-15-20 1700
Devens eCOCs Spring 2020

Date 5-15-20 1700
Time
Shipping Date:
Received by Laboratory: ***(Signature, Date, Time)*** & conditio [signature] 5/16/2020 0900 1.1/1.5

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: Lawhon, Jon K	Carrier Tracking No(s):	COC No: 680-611429.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jon.lawhon@testamericainc.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 #: 680-183926-1
Address: 4955 Yarrow Street,	Due Date Requested: 5/28/2020			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: JV, LTM - SHL Spring 2020	Project #: 68023801			
Site:	SSOW#:			

Analysis Requested

680-183926 Chain of Custody

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-12-02-SPR20 (680-183926-1)	5/15/20	15:10 Eastern		Water			X	X	2	
PZ-12-07-SPR20 (680-183926-2)	5/15/20	14:00 Eastern		Water			X	X	2	
PZ-12-09-SPR20 (680-183926-3)	5/15/20	11:55 Eastern		Water			X	X	2	
PZ-12-09-SPR20 MS (680-183926-3MS)	5/15/20	11:55 Eastern	MS	Water			X	X	2	
PZ-12-09-SPR20 MSD (680-183926-3MSD)	5/15/20	11:55 Eastern	MSD	Water			X	X	2	
PZ-12-10-SPR20 (680-183926-4)	5/15/20	10:05 Eastern		Water			X	X	2	
PZ-12-10-SPR20 MS (680-183926-4MS)	5/15/20	10:05 Eastern	MS	Water			X	X	2	
PZ-12-10-SPR20 MSD (680-183926-4MSD)	5/15/20	10:05 Eastern	MSD	Water			X	X	2	
SHM-07-05-SPR20 (680-183926-5)	5/15/20	15:15 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:	Company	Received by:	Date/Time:	Company
[signature]	5/18/2020 1247		[signature]	5/19/20 0700	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.: 1163982	Cooler Temperature(s) °C and Other Remarks: 3.0, 1.28, +0.6, DJ, 5/19/20

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: Lawhon, Jon K	Carrier Tracking No(s):	COC No: 680-611429.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: jon.lawhon@testamericainc.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 #: 680-183926-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 5/28/2020			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: JV, LTM - SHL Spring 2020	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-2016-07B-SPR20 (680-183926-6)	5/15/20	09:30 Eastern		Water			X	X	2	
SHP-2016-1A-SPR20 (680-183926-7)	5/15/20	12:00 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]	5/18/2020 1247				
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.: 1163982	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-183926-1

Login Number: 183926
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?	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").	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: 680-183926-1

Login Number: 183926
List Number: 2
Creator: Schade, Daniel B

List Source: Eurofins TestAmerica, Denver
List Creation: 05/19/20 11:08 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.	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.	True	
Residual Chlorine Checked.	True	

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ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-183965-1
Client Project/Site: JV, LTM - SHL Spring 2020

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

Authorized for release by:
6/4/2020 12:48:00 PM

Kathryn Smith, Client Service Manager
(912)250-0275
kathy.smith@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.

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

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.
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
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)
MQL	Method Quantitation Limit
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)

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
680-183965-1	EW-01-SPR20	Water	05/18/20 14:00	05/19/20 09:40	
680-183965-2	EW-04-SPR20	Water	05/18/20 13:40	05/19/20 09:40	
680-183965-3	PZ-12-01-SPR20	Water	05/18/20 09:20	05/19/20 09:40	
680-183965-4	PZ-12-03-SPR20	Water	05/18/20 12:25	05/19/20 09:40	
680-183965-5	PZ-12-04-SPR20	Water	05/18/20 13:20	05/19/20 09:40	
680-183965-6	PZ-12-06-SPR20	Water	05/18/20 15:00	05/19/20 09:40	
680-183965-7	SHL-11-SPR20	Water	05/18/20 11:25	05/19/20 09:40	
680-183965-8	SHL-20-SPR20	Water	05/18/20 10:20	05/19/20 09:40	
680-183965-9	SHL-DUP01-SPR20	Water	05/18/20 08:00	05/19/20 09:40	
680-183965-10	SHL-DUP02-SPR20	Water	05/18/20 15:00	05/19/20 09:40	

Job ID: 680-183965-1

Laboratory: Eurofins TestAmerica, Savannah

Narrative

CASE NARRATIVE
Client: Seres Engineering & Services LLC
Project: JV, LTM - SHL Spring 2020

Report Number: 680-183965-1

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 05/19/2020; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.1 C.

METALS (ICP) - DISSOLVED
Samples EW-01-SPR20 (680-183965-1), EW-04-SPR20 (680-183965-2), PZ-12-01-SPR20 (680-183965-3), PZ-12-03-SPR20 (680-183965-4), PZ-12-04-SPR20 (680-183965-5), PZ-12-06-SPR20 (680-183965-6), SHL-11-SPR20 (680-183965-7), SHL-20-SPR20 (680-183965-8), SHL-DUP01-SPR20 (680-183965-9) and SHL-DUP02-SPR20 (680-183965-10) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/20/2020 and analyzed on 05/21/2020.

Iron and Manganese recovered low for the MS/MSD of sample SHL-20-SPR20 (680-183965-8) in batch 680-619647.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICPMS) - DISSOLVED
Samples EW-01-SPR20 (680-183965-1), EW-04-SPR20 (680-183965-2), PZ-12-01-SPR20 (680-183965-3), PZ-12-03-SPR20 (680-183965-4), PZ-12-04-SPR20 (680-183965-5), PZ-12-06-SPR20 (680-183965-6), SHL-11-SPR20 (680-183965-7), SHL-20-SPR20 (680-183965-8), SHL-DUP01-SPR20 (680-183965-9) and SHL-DUP02-SPR20 (680-183965-10) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 05/20/2020 and analyzed on 05/21/2020.

Arsenic recovered low for the MS/MSD of sample SHL-20-SPR20 (680-183965-8) in batch 680-619636.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ALKALINITY
Samples EW-01-SPR20 (680-183965-1), EW-04-SPR20 (680-183965-2), PZ-12-01-SPR20 (680-183965-3), PZ-12-03-SPR20 (680-183965-4), PZ-12-04-SPR20 (680-183965-5), PZ-12-06-SPR20 (680-183965-6), SHL-11-SPR20 (680-183965-7), SHL-20-SPR20 (680-183965-8), SHL-DUP01-SPR20 (680-183965-9) and SHL-DUP02-SPR20 (680-183965-10) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 05/21/2020.

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 EW-01-SPR20 (680-183965-1), EW-04-SPR20 (680-183965-2), PZ-12-01-SPR20 (680-183965-3), PZ-12-03-SPR20 (680-183965-4), PZ-12-04-SPR20 (680-183965-5), PZ-12-06-SPR20 (680-183965-6), SHL-11-SPR20 (680-183965-7), SHL-20-SPR20 (680-183965-8), SHL-DUP01-SPR20 (680-183965-9) and SHL-DUP02-SPR20 (680-183965-10) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 05/27/2020 and 05/28/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON (TOC)

Job ID: 680-183965-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

Samples EW-01-SPR20 (680-183965-1), EW-04-SPR20 (680-183965-2), PZ-12-01-SPR20 (680-183965-3), PZ-12-03-SPR20 (680-183965-4), PZ-12-04-SPR20 (680-183965-5), PZ-12-06-SPR20 (680-183965-6), SHL-11-SPR20 (680-183965-7), SHL-20-SPR20 (680-183965-8), SHL-DUP01-SPR20 (680-183965-9) and SHL-DUP02-SPR20 (680-183965-10) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 06/02/2020.

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: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

Client Sample ID: EW-01-SPR20

Lab Sample ID: 680-183965-1
Date Collected: 05/18/20 14:00
Matrix: Water
Date Received: 05/19/20 09:40

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	17		0.50	0.20	mg/L			05/27/20 01:47	1
Sulfate	5.1		1.0	0.40	mg/L			05/27/20 01:47	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	65000		50	17	ug/L		05/20/20 10:04	05/21/20 19:44	1
Manganese	2100		10	1.0	ug/L		05/20/20 10:04	05/21/20 19:44	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1600		3.0	1.5	ug/L		05/20/20 10:04	05/21/20 14:28	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	250		10	3.1	mg/L			05/21/20 11:38	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			06/02/20 16:18	1

Client Sample ID: EW-04-SPR20

Lab Sample ID: 680-183965-2
Date Collected: 05/18/20 13:40
Matrix: Water
Date Received: 05/19/20 09:40

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.8		0.50	0.20	mg/L			05/27/20 03:31	1
Sulfate	5.3		1.0	0.40	mg/L			05/27/20 03:31	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	39000		50	17	ug/L		05/20/20 10:04	05/21/20 20:21	1
Manganese	2400		10	1.0	ug/L		05/20/20 10:04	05/21/20 20:21	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3300		3.0	1.5	ug/L		05/20/20 10:04	05/21/20 14:50	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	130		10	3.1	mg/L			05/21/20 12:03	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			06/02/20 17:05	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

Client Sample ID: PZ-12-01-SPR20

Lab Sample ID: 680-183965-3
Date Collected: 05/18/20 09:20
Matrix: Water
Date Received: 05/19/20 09:40

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	60		0.50	0.20	mg/L			05/28/20 15:51	1
Sulfate	16		1.0	0.40	mg/L			05/28/20 15:51	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	54000		50	17	ug/L		05/20/20 10:04	05/21/20 20:08	1
Manganese	2000		10	1.0	ug/L		05/20/20 10:04	05/21/20 20:08	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	540		3.0	1.5	ug/L		05/20/20 10:04	05/21/20 14:41	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	190		10	3.1	mg/L			05/21/20 12:13	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			06/02/20 17:20	1

Client Sample ID: PZ-12-03-SPR20

Lab Sample ID: 680-183965-4
Date Collected: 05/18/20 12:25
Matrix: Water
Date Received: 05/19/20 09:40

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	57		0.50	0.20	mg/L			05/28/20 16:30	1
Sulfate	4.2		1.0	0.40	mg/L			05/28/20 16:30	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	42000		50	17	ug/L		05/20/20 10:04	05/21/20 19:54	1
Manganese	3600		10	1.0	ug/L		05/20/20 10:04	05/21/20 19:54	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	740		3.0	1.5	ug/L		05/20/20 10:04	05/21/20 14:33	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	180		10	3.1	mg/L			05/21/20 12:18	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			06/02/20 17:34	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

Client Sample ID: PZ-12-04-SPR20

Lab Sample ID: 680-183965-5
Date Collected: 05/18/20 13:20
Matrix: Water
Date Received: 05/19/20 09:40

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	40		0.50	0.20	mg/L			05/28/20 16:43	1
Sulfate	3.8		1.0	0.40	mg/L			05/28/20 16:43	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	73000		50	17	ug/L		05/20/20 10:04	05/21/20 20:12	1
Manganese	1900		10	1.0	ug/L		05/20/20 10:04	05/21/20 20:12	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	750		3.0	1.5	ug/L		05/20/20 10:04	05/21/20 14:44	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	230		10	3.1	mg/L			05/21/20 12:24	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			06/02/20 17:53	1

Client Sample ID: PZ-12-06-SPR20

Lab Sample ID: 680-183965-6
Date Collected: 05/18/20 15:00
Matrix: Water
Date Received: 05/19/20 09:40

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3.3		0.50	0.20	mg/L			05/28/20 16:56	1
Sulfate	62		1.0	0.40	mg/L			05/28/20 16:56	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	4200		50	17	ug/L		05/20/20 10:04	05/21/20 20:17	1
Manganese	1200		10	1.0	ug/L		05/20/20 10:04	05/21/20 20:17	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.2		3.0	1.5	ug/L		05/20/20 10:04	05/21/20 14:47	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	74		10	3.1	mg/L			05/21/20 12:28	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			06/02/20 18:12	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

Client Sample ID: SHL-11-SPR20

Lab Sample ID: 680-183965-7
Date Collected: 05/18/20 11:25
Matrix: Water
Date Received: 05/19/20 09:40

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	67		0.50	0.20	mg/L			05/28/20 17:09	1
Sulfate	2.3		1.0	0.40	mg/L			05/28/20 17:09	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	68000		50	17	ug/L		05/20/20 10:04	05/21/20 19:49	1
Manganese	1700		10	1.0	ug/L		05/20/20 10:04	05/21/20 19:49	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	900		3.0	1.5	ug/L		05/20/20 10:04	05/21/20 14:30	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	220		10	3.1	mg/L			05/21/20 12:34	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			06/02/20 18:27	1

Client Sample ID: SHL-20-SPR20

Lab Sample ID: 680-183965-8
Date Collected: 05/18/20 10:20
Matrix: Water
Date Received: 05/19/20 09:40

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	60		0.50	0.20	mg/L			05/28/20 17:22	1
Sulfate	36		1.0	0.40	mg/L			05/28/20 17:22	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	37000	J	50	17	ug/L		05/20/20 10:04	05/21/20 19:21	1
Manganese	2600	J	10	1.0	ug/L		05/20/20 10:04	05/21/20 19:21	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	810	J	3.0	1.5	ug/L		05/20/20 10:04	05/21/20 14:14	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	110		10	3.1	mg/L			05/21/20 12:39	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			06/02/20 19:15	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

Client Sample ID: SHL-DUP01-SPR20

Lab Sample ID: 680-183965-9
Date Collected: 05/18/20 08:00
Matrix: Water
Date Received: 05/19/20 09:40

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	60		0.50	0.20	mg/L			05/28/20 17:35	1
Sulfate	37		1.0	0.40	mg/L			05/28/20 17:35	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	36000		50	17	ug/L		05/20/20 10:04	05/21/20 20:26	1
Manganese	2500		10	1.0	ug/L		05/20/20 10:04	05/21/20 20:26	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	810		3.0	1.5	ug/L		05/20/20 10:04	05/21/20 14:52	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	110		10	3.1	mg/L			05/21/20 12:43	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			06/02/20 19:34	1

Client Sample ID: SHL-DUP02-SPR20

Lab Sample ID: 680-183965-10
Date Collected: 05/18/20 15:00
Matrix: Water
Date Received: 05/19/20 09:40

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3.3		0.50	0.20	mg/L			05/28/20 17:47	1
Sulfate	62		1.0	0.40	mg/L			05/28/20 17:47	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	4500		50	17	ug/L		05/20/20 10:04	05/21/20 20:31	1
Manganese	1200		10	1.0	ug/L		05/20/20 10:04	05/21/20 20:31	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.5		3.0	1.5	ug/L		05/20/20 10:04	05/21/20 14:55	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	73		10	3.1	mg/L			05/21/20 12:48	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			06/02/20 19:52	1

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 680-619964/33
Matrix: Water
Analysis Batch: 619964

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			05/26/20 21:29	1
Sulfate	0.40	U	1.0	0.40	mg/L			05/26/20 21:29	1

Lab Sample ID: LCS 680-619964/34
Matrix: Water
Analysis Batch: 619964

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	9.69		mg/L		97	87 - 112

Lab Sample ID: LCSD 680-619964/35
Matrix: Water
Analysis Batch: 619964

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	9.76		mg/L		98	87 - 112	1	15

Lab Sample ID: MB 680-620267/2
Matrix: Water
Analysis Batch: 620267

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			05/28/20 11:59	1
Sulfate	0.40	U	1.0	0.40	mg/L			05/28/20 11:59	1

Lab Sample ID: LCS 680-620267/3
Matrix: Water
Analysis Batch: 620267

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	9.76		mg/L		98	87 - 111
Sulfate	10.0	9.48		mg/L		95	87 - 112

Lab Sample ID: LCSD 680-620267/4
Matrix: Water
Analysis Batch: 620267

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	9.72		mg/L		97	87 - 111	0	15
Sulfate	10.0	9.51	M	mg/L		95	87 - 112	0	15

Lab Sample ID: 680-183965-3 MS
Matrix: Water
Analysis Batch: 620267

Client Sample ID: PZ-12-01-SPR20
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	60		10.0	68.8	4	mg/L		93	87 - 111
Sulfate	16		10.0	25.9		mg/L		103	87 - 112

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: 680-183965-3 MSD — **Client Sample ID: PZ-12-01-SPR20**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620267

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	60		10.0	69.0	4	mg/L		95	87 - 111	0	15
Sulfate	16		10.0	25.9		mg/L		104	87 - 112	0	15

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-619340/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 619647 — **Prep Batch: 619340**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		05/20/20 10:04	05/21/20 19:12	1
Manganese	1.0	U	10	1.0	ug/L		05/20/20 10:04	05/21/20 19:12	1

Lab Sample ID: LCS 680-619340/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 619647 — **Prep Batch: 619340**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5010	5060		ug/L		101	87 - 115
Manganese	400	408		ug/L		102	90 - 114

Lab Sample ID: 680-183965-8 MS — **Client Sample ID: SHL-20-SPR20**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 619647 — **Prep Batch: 619340**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	37000	J	5010	38300	4	ug/L		29	87 - 115
Manganese	2600	J	400	2740	4	ug/L		39	90 - 114

Lab Sample ID: 680-183965-8 MSD — **Client Sample ID: SHL-20-SPR20**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 619647 — **Prep Batch: 619340**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron	37000	J	5010	39800	4	ug/L		58	87 - 115	4	20
Manganese	2600	J	400	2850	4	ug/L		65	90 - 114	4	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-619336/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 619636 — **Prep Batch: 619336**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.5	U	3.0	1.5	ug/L		05/20/20 10:04	05/21/20 14:08	1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 680-619336/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 619636 — **Prep Batch: 619336**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			100	109		ug/L		109	84 - 116		

Lab Sample ID: 680-183965-8 MS — **Client Sample ID: SHL-20-SPR20**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 619636 — **Prep Batch: 619336**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic	810	J	100	872	4	ug/L		62	84 - 116		

Lab Sample ID: 680-183965-8 MSD — **Client Sample ID: SHL-20-SPR20**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 619636 — **Prep Batch: 619336**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	810	J	100	878	4	ug/L		69	84 - 116	1	20

Method: 9060A - Organic Carbon, Dissolved (DOC)

Lab Sample ID: MB 280-497282/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

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			06/02/20 15:49	1

Lab Sample ID: LCS 280-497282/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Dissolved Organic Carbon			25.0	25.9		mg/L		104	88 - 112		

Lab Sample ID: 680-183965-1 MS — **Client Sample ID: EW-01-SPR20**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Dissolved Organic Carbon	4.8		25.0	30.4		mg/L		102	88 - 112		

Lab Sample ID: 680-183965-1 MSD — **Client Sample ID: EW-01-SPR20**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Organic Carbon	4.8		25.0	30.4		mg/L		102	88 - 112	0	15

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 280-495774/31
Matrix: Water
Analysis Batch: 495774

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			05/21/20 11:58	1

Lab Sample ID: MB 280-495774/5
Matrix: Water
Analysis Batch: 495774

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			05/21/20 09:44	1

Lab Sample ID: LCS 280-495774/30
Matrix: Water
Analysis Batch: 495774

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Alkalinity			200	211		mg/L		106	89 - 109		

Lab Sample ID: LCS 280-495774/4
Matrix: Water
Analysis Batch: 495774

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Alkalinity			200	213		mg/L		107	89 - 109		

Lab Sample ID: 680-183965-2 DU
Matrix: Water
Analysis Batch: 495774

Client Sample ID: EW-04-SPR20
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity	130			133		mg/L				2	10

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

HPLC/IC

Analysis Batch: 619964

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183965-1	EW-01-SPR20	Total/NA	Water	9056A	
680-183965-2	EW-04-SPR20	Total/NA	Water	9056A	
MB 680-619964/33	Method Blank	Total/NA	Water	9056A	
LCS 680-619964/34	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-619964/35	Lab Control Sample Dup	Total/NA	Water	9056A	

Analysis Batch: 620267

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183965-3	PZ-12-01-SPR20	Total/NA	Water	9056A	
680-183965-4	PZ-12-03-SPR20	Total/NA	Water	9056A	
680-183965-5	PZ-12-04-SPR20	Total/NA	Water	9056A	
680-183965-6	PZ-12-06-SPR20	Total/NA	Water	9056A	
680-183965-7	SHL-11-SPR20	Total/NA	Water	9056A	
680-183965-8	SHL-20-SPR20	Total/NA	Water	9056A	
680-183965-9	SHL-DUP01-SPR20	Total/NA	Water	9056A	
680-183965-10	SHL-DUP02-SPR20	Total/NA	Water	9056A	
MB 680-620267/2	Method Blank	Total/NA	Water	9056A	
LCS 680-620267/3	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-620267/4	Lab Control Sample Dup	Total/NA	Water	9056A	
680-183965-3 MS	PZ-12-01-SPR20	Total/NA	Water	9056A	
680-183965-3 MSD	PZ-12-01-SPR20	Total/NA	Water	9056A	

Metals

Prep Batch: 619336

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183965-1	EW-01-SPR20	Dissolved	Water	3005A	
680-183965-2	EW-04-SPR20	Dissolved	Water	3005A	
680-183965-3	PZ-12-01-SPR20	Dissolved	Water	3005A	
680-183965-4	PZ-12-03-SPR20	Dissolved	Water	3005A	
680-183965-5	PZ-12-04-SPR20	Dissolved	Water	3005A	
680-183965-6	PZ-12-06-SPR20	Dissolved	Water	3005A	
680-183965-7	SHL-11-SPR20	Dissolved	Water	3005A	
680-183965-8	SHL-20-SPR20	Dissolved	Water	3005A	
680-183965-9	SHL-DUP01-SPR20	Dissolved	Water	3005A	
680-183965-10	SHL-DUP02-SPR20	Dissolved	Water	3005A	
MB 680-619336/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-619336/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-183965-8 MS	SHL-20-SPR20	Dissolved	Water	3005A	
680-183965-8 MSD	SHL-20-SPR20	Dissolved	Water	3005A	

Prep Batch: 619340

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183965-1	EW-01-SPR20	Dissolved	Water	3005A	
680-183965-2	EW-04-SPR20	Dissolved	Water	3005A	
680-183965-3	PZ-12-01-SPR20	Dissolved	Water	3005A	
680-183965-4	PZ-12-03-SPR20	Dissolved	Water	3005A	
680-183965-5	PZ-12-04-SPR20	Dissolved	Water	3005A	
680-183965-6	PZ-12-06-SPR20	Dissolved	Water	3005A	
680-183965-7	SHL-11-SPR20	Dissolved	Water	3005A	
680-183965-8	SHL-20-SPR20	Dissolved	Water	3005A	

Metals (Continued)

Prep Batch: 619340 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183965-9	SHL-DUP01-SPR20	Dissolved	Water	3005A	
680-183965-10	SHL-DUP02-SPR20	Dissolved	Water	3005A	
MB 680-619340/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-619340/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-183965-8 MS	SHL-20-SPR20	Dissolved	Water	3005A	
680-183965-8 MSD	SHL-20-SPR20	Dissolved	Water	3005A	

Analysis Batch: 619636

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183965-1	EW-01-SPR20	Dissolved	Water	6020A	619336
680-183965-2	EW-04-SPR20	Dissolved	Water	6020A	619336
680-183965-3	PZ-12-01-SPR20	Dissolved	Water	6020A	619336
680-183965-4	PZ-12-03-SPR20	Dissolved	Water	6020A	619336
680-183965-5	PZ-12-04-SPR20	Dissolved	Water	6020A	619336
680-183965-6	PZ-12-06-SPR20	Dissolved	Water	6020A	619336
680-183965-7	SHL-11-SPR20	Dissolved	Water	6020A	619336
680-183965-8	SHL-20-SPR20	Dissolved	Water	6020A	619336
680-183965-9	SHL-DUP01-SPR20	Dissolved	Water	6020A	619336
680-183965-10	SHL-DUP02-SPR20	Dissolved	Water	6020A	619336
MB 680-619336/1-A	Method Blank	Total Recoverable	Water	6020A	619336
LCS 680-619336/2-A	Lab Control Sample	Total Recoverable	Water	6020A	619336
680-183965-8 MS	SHL-20-SPR20	Dissolved	Water	6020A	619336
680-183965-8 MSD	SHL-20-SPR20	Dissolved	Water	6020A	619336

Analysis Batch: 619647

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183965-1	EW-01-SPR20	Dissolved	Water	6010C	619340
680-183965-2	EW-04-SPR20	Dissolved	Water	6010C	619340
680-183965-3	PZ-12-01-SPR20	Dissolved	Water	6010C	619340
680-183965-4	PZ-12-03-SPR20	Dissolved	Water	6010C	619340
680-183965-5	PZ-12-04-SPR20	Dissolved	Water	6010C	619340
680-183965-6	PZ-12-06-SPR20	Dissolved	Water	6010C	619340
680-183965-7	SHL-11-SPR20	Dissolved	Water	6010C	619340
680-183965-8	SHL-20-SPR20	Dissolved	Water	6010C	619340
680-183965-9	SHL-DUP01-SPR20	Dissolved	Water	6010C	619340
680-183965-10	SHL-DUP02-SPR20	Dissolved	Water	6010C	619340
MB 680-619340/1-A	Method Blank	Total Recoverable	Water	6010C	619340
LCS 680-619340/2-A	Lab Control Sample	Total Recoverable	Water	6010C	619340
680-183965-8 MS	SHL-20-SPR20	Dissolved	Water	6010C	619340
680-183965-8 MSD	SHL-20-SPR20	Dissolved	Water	6010C	619340

General Chemistry

Analysis Batch: 495774

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183965-1	EW-01-SPR20	Total/NA	Water	SM 2320B	
680-183965-2	EW-04-SPR20	Total/NA	Water	SM 2320B	
680-183965-3	PZ-12-01-SPR20	Total/NA	Water	SM 2320B	
680-183965-4	PZ-12-03-SPR20	Total/NA	Water	SM 2320B	
680-183965-5	PZ-12-04-SPR20	Total/NA	Water	SM 2320B	
680-183965-6	PZ-12-06-SPR20	Total/NA	Water	SM 2320B	

General Chemistry (Continued)

Analysis Batch: 495774 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183965-7	SHL-11-SPR20	Total/NA	Water	SM 2320B	
680-183965-8	SHL-20-SPR20	Total/NA	Water	SM 2320B	
680-183965-9	SHL-DUP01-SPR20	Total/NA	Water	SM 2320B	
680-183965-10	SHL-DUP02-SPR20	Total/NA	Water	SM 2320B	
MB 280-495774/31	Method Blank	Total/NA	Water	SM 2320B	
MB 280-495774/5	Method Blank	Total/NA	Water	SM 2320B	
LCS 280-495774/30	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 280-495774/4	Lab Control Sample	Total/NA	Water	SM 2320B	
680-183965-2 DU	EW-04-SPR20	Total/NA	Water	SM 2320B	

Analysis Batch: 497282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-183965-1	EW-01-SPR20	Dissolved	Water	9060A	
680-183965-2	EW-04-SPR20	Dissolved	Water	9060A	
680-183965-3	PZ-12-01-SPR20	Dissolved	Water	9060A	
680-183965-4	PZ-12-03-SPR20	Dissolved	Water	9060A	
680-183965-5	PZ-12-04-SPR20	Dissolved	Water	9060A	
680-183965-6	PZ-12-06-SPR20	Dissolved	Water	9060A	
680-183965-7	SHL-11-SPR20	Dissolved	Water	9060A	
680-183965-8	SHL-20-SPR20	Dissolved	Water	9060A	
680-183965-9	SHL-DUP01-SPR20	Dissolved	Water	9060A	
680-183965-10	SHL-DUP02-SPR20	Dissolved	Water	9060A	
MB 280-497282/4	Method Blank	Dissolved	Water	9060A	
LCS 280-497282/3	Lab Control Sample	Dissolved	Water	9060A	
680-183965-1 MS	EW-01-SPR20	Dissolved	Water	9060A	
680-183965-1 MSD	EW-01-SPR20	Dissolved	Water	9060A	

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

Client Sample ID: EW-01-SPR20

Lab Sample ID: 680-183965-1

Date Collected: 05/18/20 14:00
Matrix: Water
Date Received: 05/19/20 09:40

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	619964	05/27/20 01:47	UI	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619340	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619647	05/21/20 19:44	BWR	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619336	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 14:28	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 16:18	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 11:38	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: EW-04-SPR20

Lab Sample ID: 680-183965-2

Date Collected: 05/18/20 13:40
Matrix: Water
Date Received: 05/19/20 09:40

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	619964	05/27/20 03:31	UI	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619340	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619647	05/21/20 20:21	BWR	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619336	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 14:50	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 17:05	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 12:03	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: PZ-12-01-SPR20

Lab Sample ID: 680-183965-3

Date Collected: 05/18/20 09:20
Matrix: Water
Date Received: 05/19/20 09:40

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	620267	05/28/20 15:51	UI	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619340	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619647	05/21/20 20:08	BWR	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619336	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 14:41	BJB	TAL SAV
	Instrument ID: ICPMSD									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

Client Sample ID: PZ-12-01-SPR20
Date Collected: 05/18/20 09:20
Date Received: 05/19/20 09:40

Lab Sample ID: 680-183965-3
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	497282	06/02/20 17:20	JMB	TAL DEN
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 12:13	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: PZ-12-03-SPR20
Date Collected: 05/18/20 12:25
Date Received: 05/19/20 09:40

Lab Sample ID: 680-183965-4
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	620267	05/28/20 16:30	UI	TAL SAV
	Instrument ID:	CICH								
Dissolved	Prep	3005A			50 mL	50 mL	619340	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619647	05/21/20 19:54	BWR	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	619336	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 14:33	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 17:34	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 12:18	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: PZ-12-04-SPR20
Date Collected: 05/18/20 13:20
Date Received: 05/19/20 09:40

Lab Sample ID: 680-183965-5
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	620267	05/28/20 16:43	UI	TAL SAV
	Instrument ID:	CICH								
Dissolved	Prep	3005A			50 mL	50 mL	619340	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619647	05/21/20 20:12	BWR	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	619336	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 14:44	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 17:53	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 12:24	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

Client Sample ID: PZ-12-06-SPR20

Lab Sample ID: 680-183965-6
Date Collected: 05/18/20 15:00
Matrix: Water
Date Received: 05/19/20 09:40

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	620267	05/28/20 16:56	UI	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619340	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619647	05/21/20 20:17	BWR	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619336	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 14:47	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 18:12	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 12:28	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHL-11-SPR20

Lab Sample ID: 680-183965-7
Date Collected: 05/18/20 11:25
Matrix: Water
Date Received: 05/19/20 09:40

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	620267	05/28/20 17:09	UI	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619340	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619647	05/21/20 19:49	BWR	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619336	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 14:30	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 18:27	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 12:34	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHL-20-SPR20

Lab Sample ID: 680-183965-8
Date Collected: 05/18/20 10:20
Matrix: Water
Date Received: 05/19/20 09:40

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	620267	05/28/20 17:22	UI	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619340	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619647	05/21/20 19:21	BWR	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619336	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 14:14	BJB	TAL SAV
	Instrument ID: ICPMSD									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

Client Sample ID: SHL-20-SPR20

Lab Sample ID: 680-183965-8
Date Collected: 05/18/20 10:20
Matrix: Water
Date Received: 05/19/20 09:40

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	497282	06/02/20 19:15	JMB	TAL DEN
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 12:39	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHL-DUP01-SPR20

Lab Sample ID: 680-183965-9
Date Collected: 05/18/20 08:00
Matrix: Water
Date Received: 05/19/20 09:40

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	620267	05/28/20 17:35	UI	TAL SAV
	Instrument ID:	CICH								
Dissolved	Prep	3005A			50 mL	50 mL	619340	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619647	05/21/20 20:26	BWR	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	619336	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 14:52	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 19:34	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 12:43	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHL-DUP02-SPR20

Lab Sample ID: 680-183965-10
Date Collected: 05/18/20 15:00
Matrix: Water
Date Received: 05/19/20 09:40

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	620267	05/28/20 17:47	UI	TAL SAV
	Instrument ID:	CICH								
Dissolved	Prep	3005A			50 mL	50 mL	619340	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619647	05/21/20 20:31	BWR	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	619336	05/20/20 10:04	AJR	TAL SAV
Dissolved	Analysis	6020A		1			619636	05/21/20 14:55	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 19:52	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			495774	05/21/20 12:48	SPG	TAL DEN
	Instrument ID:	WC-AT3								

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: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

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: JV, LTM - SHL Spring 2020

Job ID: 680-183965-1

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
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

Boston #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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
	Analytical Test Method					46	9	9	5	3					
1	EPA-PZ-2012-1A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-1A	N1	23.70	28.70	
2	EPA-PZ-2012-1B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-1B	N1	73.56	78.56	
3	EPA-PZ-2012-2A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-2A	N1	18.14	23.14	
4	EPA-PZ-2012-2B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-2B	N1	73.16	78.16	
5	EPA-PZ-2012-3A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-3A	N1	19.09	24.09	
6	EPA-PZ-2012-3B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-3B	N1	68.70	73.70	
7	EPA-PZ-2012-4A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-4A	N1	19.56	24.56	
8	EPA-PZ-2012-4B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-4B	N1	79.50	84.50	
9	EPA-PZ-2012-5A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-5A	N1	17.95	22.95	
10	EPA-PZ-2012-5B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-5B	N1	68.46	73.46	
11	EPA-PZ-2012-6A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-6A	N1	24.19	29.19	
12	EPA-PZ-2012-6B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-6B	N1	74.23	79.23	
13	EPA-PZ-2012-7A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-7A	N1	23.87	28.87	
14	EPA-PZ-2012-7B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-7B	N1	58.82	63.82	
15	EW-01-SPR20	WG	5-18-20	1400	GO	X	X	X	X	X	EW-01	N1	60.00	85.00	
16	EW-04-SPR20	WG	5-18-20	1340	GO	X	X	X	X	X	EW-04	N1	70.00	95.00	
17	PZ-12-01-SPR20	WG	5-18-20	920	DC	X	X	X	X	X	PZ-12-01	N1	24.00	34.00	
18	PZ-12-02-SPR20	WG				X	X	X	X	X	PZ-12-02	N1	24.00	34.00	

680-183965 Chain of Custody

Relinquished by: *(Signature)* Desmond Redard
Date 05/18/20
Time 16:45
Received by: *(Signature)* [signature] 5-18-20 1645
Devens eCOCs Spring 2020

Date [signature] 5-18-20
Time 1840
Shipping Date:
Received by Laboratory: ***(Signature, Date, Time)*** & conditio [signature] 1.7/2.1 5-19-2020/0940

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

Boston #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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-12-03-SPR20	WG	5-18-20	1225	DC	X	X	X	X	X	PZ-12-03	N1	24.00	34.00		
20	PZ-12-04-SPR20	WG	5-18-20	1320	DC	X	X	X	X	X	PZ-12-04	N1	24.00	34.00		
21	PZ-12-05-SPR20	WG				X	X	X	X	X	PZ-12-05	N1	26.00	36.00		
22	PZ-12-06-SPR20	WG	5-18-20	1500	DC	X	X	X	X	X	PZ-12-06	N1	25.00	35.00		
23	PZ-12-07-SPR20	WG				X	X	X	X	X	PZ-12-07	N1	20.00	30.00		
24	PZ-12-08-SPR20	WG				X	X	X	X	X	PZ-12-08	N1	22.00	32.00		
25	PZ-12-09-SPR20	WG				X	X	X	X	X	PZ-12-09	MS1	20.00	30.00		
26	PZ-12-09-SPR20	WG				X	X	X	X	X	PZ-12-09	N1	20.00	30.00		
27	PZ-12-09-SPR20	WG				X	X	X	X	X	PZ-12-09	SD1	20.00	30.00		
28	PZ-12-10-SPR20	WG				X	X	X	X	X	PZ-12-10	N1	20.00	30.00		
29	SHL-10-SPR20	WG				X	X	X	X	X	SHL-10	N1	24.00	39.00		
30	SHL-11-SPR20	WG	5-18-20	1125	DC	X	X	X	X	X	SHL-11	N1	12.00	27.00		
31	SHL-19-SPR20	WG				X	X	X	X	X	SHL-19	N1	20.00	30.00		
32	SHL-20-SPR20	WG	5-18-20	1020	DC	X	X	X	X	X	SHL-20	N1	39.00	49.00		
33	SHL-4-SPR20	WG				X	X	X	X	X	SHL-4	N1	3.00	13.00		
34	SHL-DUP01-SPR20	WG	5-18-20	800	DC	X	X	X	X	X	~~PZ-12-06~~ SHL-20	FD1	25.00	~~4900~~ 4900		
35	SHL-DUP02-SPR20	WG	5-18-20	1500	DC	X	X	X	X	X	~~SHL-20~~ PZ-12-06	FD1	39.00	~~35.00~~ 35.00		
36	SHL-DUP03-SPR20	WG				X	X	X	X	X	SHM-11-06	FD1	25.00	35.00		

Relinquished by: *(Signature)* Bernard Redford
Date 05/18/20
Time 16:45
Received by: *(Signature)* 5-18-20 1645
Devens eCOCs Spring 2020

Date 5-18-20
Time 1845
Shipping Date:
Received by Laboratory: *(Signature, Date, Time)* & conditio 1721 5-19-2020/0940

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: Lawhon, Jon K	Carrier Tracking No(s):	COC No: 680-611577.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jon.lawhon@testamericainc.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 #: 680-183965-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 5/29/2020			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: JV, LTM - SHL Spring 2020	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:							
EW-01-SPR20 (680-183965-1)	5/18/20	14:00 Eastern		Water			X	X	2	
EW-04-SPR20 (680-183965-2)	5/18/20	13:40 Eastern		Water			X	X	2	
PZ-12-01-SPR20 (680-183965-3)	5/18/20	09:20 Eastern		Water			X	X	2	
PZ-12-03-SPR20 (680-183965-4)	5/18/20	12:25 Eastern		Water			X	X	2	
PZ-12-04-SPR20 (680-183965-5)	5/18/20	13:20 Eastern		Water			X	X	2	
PZ-12-06-SPR20 (680-183965-6)	5/18/20	15:00 Eastern		Water			X	X	2	
SHL-11-SPR20 (680-183965-7)	5/18/20	11:25 Eastern		Water			X	X	2	
SHL-20-SPR20 (680-183965-8)	5/18/20	10:20 Eastern		Water			X	X	2	
SHL-DUP01-SPR20 (680-183965-9)	5/18/20	08:00 Eastern		Water			X	X	2	

680-183965 Chain of Custody

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]	5-19-20 1600	TA	[signature]	5/20/20 0940	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: 0.4, IR8, +0.6, DS, 5/20/20

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: Lawhon, Jon K	Carrier Tracking No(s):	COC No: 680-611577.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: jon.lawhon@testamericainc.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 #: 680-183965-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 5/29/2020			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: JV, LTM - SHL Spring 2020	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-DUP02-SPR20 (680-183965-10)	5/18/20	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 labo

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: 5-19-20 1600	Company:	Received by:	Date/Time: 5/20/20 0940	Company: ETLADEW
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: 0.4, IR8, +0.6, DS, 5/20/20		

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-183965-1

Login Number: 183965
List Number: 1
Creator: Mooken, Darmal

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: 680-183965-1

Login Number: 183965
List Number: 2
Creator: Schade, Daniel B

List Source: Eurofins TestAmerica, Denver
List Creation: 05/20/20 12:10 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.	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.	True	
Residual Chlorine Checked.	True	

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ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-184026-1
Client Project/Site: JV, LTM - SHL Spring 2020

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Nathan R Mullens

Kathryn Smith

Authorized for release by:
6/4/2020 12:52:22 PM

Kathryn Smith, Client Service Manager
(912)250-0275
kathy.smith@testamericainc.com

LINKS

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Have a Question? Ask The Expert

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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.

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

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
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
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)
MQL	Method Quantitation Limit
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)

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
680-184026-1	EPA-PZ-2012-1A-SPR20	Water	05/19/20 13:30	05/20/20 09:30	
680-184026-2	EPA-PZ-2012-1B-SPR20	Water	05/19/20 15:35	05/20/20 09:30	
680-184026-3	EPA-PZ-2012-2A-SPR20	Water	05/19/20 15:25	05/20/20 09:30	
680-184026-4	EPA-PZ-2012-4A-SPR20	Water	05/19/20 10:15	05/20/20 09:30	
680-184026-5	EPA-PZ-2012-4B-SPR20	Water	05/19/20 11:30	05/20/20 09:30	
680-184026-6	PZ-12-05-SPR20	Water	05/18/20 16:15	05/20/20 09:30	
680-184026-7	PZ-12-08-SPR20	Water	05/19/20 10:05	05/20/20 09:30	
680-184026-8	SHL-10-SPR20	Water	05/19/20 14:05	05/20/20 09:30	
680-184026-9	SHL-19-SPR20	Water	05/19/20 12:00	05/20/20 09:30	
680-184026-10	SHL-DUP05-SPR20	Water	05/19/20 00:00	05/20/20 09:30	
680-184026-11	SHL-DUP06-SPR20	Water	05/19/20 10:00	05/20/20 09:30	
680-184026-12	SHM-05-40X-SPR20	Water	05/19/20 11:15	05/20/20 09:30	
680-184026-13	SHM-07-05X-SPR20	Water	05/18/20 16:25	05/20/20 09:30	
680-184026-14	SHM-11-02-SPR20	Water	05/19/20 15:50	05/20/20 09:30	
680-184026-15	SHM-13-06-SPR20	Water	05/19/20 08:55	05/20/20 09:30	
680-184026-16	SHM-96-5B-SPR20	Water	05/19/20 13:40	05/20/20 09:30	
680-184026-17	SHP-2016-1B-SPR20	Water	05/19/20 09:00	05/20/20 09:30	

Job ID: 680-184026-1

Laboratory: Eurofins TestAmerica, Savannah

Narrative

CASE NARRATIVE
Client: Seres Engineering & Services LLC
Project: JV, LTM - SHL Spring 2020

Report Number: 680-184026-1

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 05/20/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.4°C and 4.4°C.

METALS (ICP) - DISSOLVED
Samples EPA-PZ-2012-1A-SPR20 (680-184026-1), EPA-PZ-2012-1B-SPR20 (680-184026-2), EPA-PZ-2012-2A-SPR20 (680-184026-3), EPA-PZ-2012-4A-SPR20 (680-184026-4), EPA-PZ-2012-4B-SPR20 (680-184026-5), PZ-12-05-SPR20 (680-184026-6), PZ-12-08-SPR20 (680-184026-7), SHL-10-SPR20 (680-184026-8), SHL-19-SPR20 (680-184026-9), SHL-DUP05-SPR20 (680-184026-10), SHL-DUP06-SPR20 (680-184026-11), SHM-05-40X-SPR20 (680-184026-12), SHM-07-05X-SPR20 (680-184026-13), SHM-11-02-SPR20 (680-184026-14), SHM-13-06-SPR20 (680-184026-15), SHM-96-5B-SPR20 (680-184026-16) and SHP-2016-1B-SPR20 (680-184026-17) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/21/2020, 05/26/2020 and 06/01/2020 and analyzed on 05/22/2020, 05/27/2020 and 06/02/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICPMS) - DISSOLVED
Samples EPA-PZ-2012-1A-SPR20 (680-184026-1), EPA-PZ-2012-1B-SPR20 (680-184026-2), EPA-PZ-2012-2A-SPR20 (680-184026-3), EPA-PZ-2012-4A-SPR20 (680-184026-4), EPA-PZ-2012-4B-SPR20 (680-184026-5), PZ-12-05-SPR20 (680-184026-6), PZ-12-08-SPR20 (680-184026-7), SHL-10-SPR20 (680-184026-8), SHL-19-SPR20 (680-184026-9), SHL-DUP05-SPR20 (680-184026-10), SHL-DUP06-SPR20 (680-184026-11), SHM-05-40X-SPR20 (680-184026-12), SHM-07-05X-SPR20 (680-184026-13), SHM-11-02-SPR20 (680-184026-14), SHM-13-06-SPR20 (680-184026-15), SHM-96-5B-SPR20 (680-184026-16) and SHP-2016-1B-SPR20 (680-184026-17) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 05/21/2020, 05/26/2020 and 06/01/2020 and analyzed on 05/26/2020, 05/27/2020 and 06/02/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ALKALINITY
Samples EPA-PZ-2012-1A-SPR20 (680-184026-1), EPA-PZ-2012-1B-SPR20 (680-184026-2), EPA-PZ-2012-2A-SPR20 (680-184026-3), EPA-PZ-2012-4A-SPR20 (680-184026-4), EPA-PZ-2012-4B-SPR20 (680-184026-5), PZ-12-05-SPR20 (680-184026-6), PZ-12-08-SPR20 (680-184026-7), SHL-10-SPR20 (680-184026-8), SHL-19-SPR20 (680-184026-9), SHL-DUP05-SPR20 (680-184026-10), SHL-DUP06-SPR20 (680-184026-11), SHM-05-40X-SPR20 (680-184026-12), SHM-07-05X-SPR20 (680-184026-13), SHM-11-02-SPR20 (680-184026-14), SHM-13-06-SPR20 (680-184026-15), SHM-96-5B-SPR20 (680-184026-16) and SHP-2016-1B-SPR20 (680-184026-17) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 05/26/2020.

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-2012-1A-SPR20 (680-184026-1), EPA-PZ-2012-1B-SPR20 (680-184026-2), EPA-PZ-2012-2A-SPR20 (680-184026-3), EPA-PZ-2012-4A-SPR20 (680-184026-4), EPA-PZ-2012-4B-SPR20 (680-184026-5), PZ-12-05-SPR20 (680-184026-6), PZ-12-08-SPR20 (680-184026-7), SHL-10-SPR20 (680-184026-8), SHL-19-SPR20 (680-184026-9), SHL-DUP05-SPR20 (680-184026-10), SHL-DUP06-SPR20 (680-184026-11), SHM-05-40X-SPR20 (680-184026-12), SHM-07-05X-SPR20 (680-184026-13), SHM-11-02-SPR20

Job ID: 680-184026-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

(680-184026-14), SHM-13-06-SPR20 (680-184026-15), SHM-96-5B-SPR20 (680-184026-16) and SHP-2016-1B-SPR20 (680-184026-17) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with SW 846 9056A. The samples were analyzed on 05/28/2020, 05/29/2020 and 05/30/2020.

Samples EPA-PZ-2012-4B-SPR20 (680-184026-5)[5X], SHL-DUP05-SPR20 (680-184026-10)[5X], SHL-DUP06-SPR20 (680-184026-11)[5X], SHM-05-40X-SPR20 (680-184026-12)[5X], SHM-13-06-SPR20 (680-184026-15)[5X] and SHM-96-5B-SPR20 (680-184026-16)[5X] 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.

TOTAL ORGANIC CARBON (TOC)

Samples EPA-PZ-2012-1A-SPR20 (680-184026-1), EPA-PZ-2012-1B-SPR20 (680-184026-2), EPA-PZ-2012-2A-SPR20 (680-184026-3), EPA-PZ-2012-4A-SPR20 (680-184026-4), EPA-PZ-2012-4B-SPR20 (680-184026-5), PZ-12-05-SPR20 (680-184026-6), PZ-12-08-SPR20 (680-184026-7), SHL-10-SPR20 (680-184026-8), SHL-19-SPR20 (680-184026-9), SHL-DUP05-SPR20 (680-184026-10), SHL-DUP06-SPR20 (680-184026-11), SHM-05-40X-SPR20 (680-184026-12), SHM-07-05X-SPR20 (680-184026-13), SHM-11-02-SPR20 (680-184026-14), SHM-13-06-SPR20 (680-184026-15), SHM-96-5B-SPR20 (680-184026-16) and SHP-2016-1B-SPR20 (680-184026-17) were analyzed for Total Organic Carbon (TOC) in accordance with EPA SW-846 9060A. The samples were analyzed on 06/02/2020 and 06/03/2020.

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: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: EPA-PZ-2012-1A-SPR20

Lab Sample ID: 680-184026-1
Date Collected: 05/19/20 13:30
Matrix: Water
Date Received: 05/20/20 09:30

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	15		0.50	0.20	mg/L			05/28/20 17:19	1
Sulfate	1.2		1.0	0.40	mg/L			05/28/20 17:19	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	270		50	17	ug/L		05/21/20 13:38	05/22/20 21:33	1
Manganese	290		10	1.0	ug/L		05/21/20 13:38	05/22/20 21:33	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		05/21/20 13:38	05/26/20 16:05	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	44		10	3.1	mg/L			05/26/20 13:15	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			06/02/20 21:00	1

Client Sample ID: EPA-PZ-2012-1B-SPR20

Lab Sample ID: 680-184026-2
Date Collected: 05/19/20 15:35
Matrix: Water
Date Received: 05/20/20 09:30

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	36		0.50	0.20	mg/L			05/28/20 16:03	1
Sulfate	14		1.0	0.40	mg/L			05/28/20 16:03	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	9600		50	17	ug/L		05/21/20 13:38	05/22/20 21:28	1
Manganese	9000		10	1.0	ug/L		05/21/20 13:38	05/22/20 21:28	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		05/21/20 13:38	05/26/20 16:02	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	200		10	3.1	mg/L			05/26/20 13:33	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			06/02/20 21:23	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: EPA-PZ-2012-2A-SPR20

Lab Sample ID: 680-184026-3
Date Collected: 05/19/20 15:25
Matrix: Water
Date Received: 05/20/20 09:30

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.8		0.50	0.20	mg/L			05/28/20 16:16	1
Sulfate	6.3		1.0	0.40	mg/L			05/28/20 16:16	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		05/26/20 11:14	05/27/20 18:07	1
Manganese	1.1	J	10	1.0	ug/L		05/26/20 11:14	05/27/20 18:07	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		05/26/20 11:14	05/27/20 09:04	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	11		10	3.1	mg/L			05/26/20 13:38	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			06/02/20 21:39	1

Client Sample ID: EPA-PZ-2012-4A-SPR20

Lab Sample ID: 680-184026-4
Date Collected: 05/19/20 10:15
Matrix: Water
Date Received: 05/20/20 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			05/28/20 17:57	1
Sulfate	1.5		1.0	0.40	mg/L			05/28/20 17:57	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	4900		50	17	ug/L		05/21/20 13:38	05/22/20 21:19	1
Manganese	640		10	1.0	ug/L		05/21/20 13:38	05/22/20 21:19	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.7	J	3.0	1.5	ug/L		05/21/20 13:38	05/26/20 15:51	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	75		10	3.1	mg/L			05/26/20 13:43	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	9.4		1.0	0.35	mg/L			06/02/20 21:56	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: EPA-PZ-2012-4B-SPR20

Lab Sample ID: 680-184026-5
Date Collected: 05/19/20 11:30
Matrix: Water
Date Received: 05/20/20 09:30

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	25		2.5	1.0	mg/L			05/30/20 00:52	5
Sulfate	12		5.0	2.0	mg/L			05/30/20 00:52	5

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	66000		50	17	ug/L		05/21/20 13:38	05/22/20 21:37	1
Manganese	640		10	1.0	ug/L		05/21/20 13:38	05/22/20 21:37	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1800		3.0	1.5	ug/L		05/21/20 13:38	05/26/20 16:08	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	160		10	3.1	mg/L			05/26/20 13:47	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			06/02/20 22:45	1

Client Sample ID: PZ-12-05-SPR20

Lab Sample ID: 680-184026-6
Date Collected: 05/18/20 16:15
Matrix: Water
Date Received: 05/20/20 09:30

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.4		0.50	0.20	mg/L			05/30/20 04:18	1
Sulfate	7.0		1.0	0.40	mg/L			05/30/20 04:18	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	19000		50	17	ug/L		05/21/20 13:38	05/22/20 21:23	1
Manganese	1400		10	1.0	ug/L		05/21/20 13:38	05/22/20 21:23	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		05/21/20 13:38	05/26/20 15:54	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	76		10	3.1	mg/L			05/26/20 13:52	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			06/02/20 23:01	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: PZ-12-08-SPR20

Lab Sample ID: 680-184026-7
Date Collected: 05/19/20 10:05
Matrix: Water
Date Received: 05/20/20 09:30

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.60		0.50	0.20	mg/L			05/30/20 04:31	1
Sulfate	16		1.0	0.40	mg/L			05/30/20 04:31	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	5200		50	17	ug/L		05/26/20 11:14	05/27/20 18:25	1
Manganese	1200		10	1.0	ug/L		05/26/20 11:14	05/27/20 18:25	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.7	J	3.0	1.5	ug/L		05/26/20 11:14	05/27/20 09:20	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	58		10	3.1	mg/L			05/26/20 13:56	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			06/02/20 23:18	1

Client Sample ID: SHL-10-SPR20

Lab Sample ID: 680-184026-8
Date Collected: 05/19/20 14:05
Matrix: Water
Date Received: 05/20/20 09:30

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.0		0.50	0.20	mg/L			05/30/20 04:44	1
Sulfate	1.6		1.0	0.40	mg/L			05/30/20 04:44	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		05/26/20 11:14	05/27/20 18:21	1
Manganese	1.0	U	10	1.0	ug/L		05/26/20 11:14	05/27/20 18:21	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		05/26/20 11:14	05/27/20 09:18	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	9.2	J	10	3.1	mg/L			05/26/20 14:01	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	0.38	J	1.0	0.35	mg/L			06/02/20 23:35	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: SHL-19-SPR20

Lab Sample ID: 680-184026-9
Date Collected: 05/19/20 12:00
Matrix: Water
Date Received: 05/20/20 09:30

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.31	J	0.50	0.20	mg/L			05/29/20 21:13	1
Sulfate	3.2		1.0	0.40	mg/L			05/29/20 21:13	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	1400		50	17	ug/L		06/01/20 10:31	06/02/20 00:06	1
Manganese	62		10	1.0	ug/L		06/01/20 10:31	06/02/20 00:06	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		06/01/20 10:31	06/02/20 18:46	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	33		10	3.1	mg/L			05/26/20 14:05	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			06/02/20 23:50	1

Client Sample ID: SHL-DUP05-SPR20

Lab Sample ID: 680-184026-10
Date Collected: 05/19/20 00:00
Matrix: Water
Date Received: 05/20/20 09:30

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	25		2.5	1.0	mg/L			05/30/20 01:05	5
Sulfate	11		5.0	2.0	mg/L			05/30/20 01:05	5

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	60000		50	17	ug/L		05/26/20 11:14	05/27/20 18:16	1
Manganese	590		10	1.0	ug/L		05/26/20 11:14	05/27/20 18:16	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		05/26/20 11:14	05/27/20 09:15	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	160		10	3.1	mg/L			05/26/20 14:10	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			06/03/20 00:55	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: SHL-DUP06-SPR20

Lab Sample ID: 680-184026-11
Date Collected: 05/19/20 10:00
Matrix: Water
Date Received: 05/20/20 09:30

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27		2.5	1.0	mg/L			05/29/20 22:56	5
Sulfate	3.2	J	5.0	2.0	mg/L			05/29/20 22:56	5

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	23000		50	17	ug/L		05/21/20 13:38	05/22/20 21:14	1
Manganese	700		10	1.0	ug/L		05/21/20 13:38	05/22/20 21:14	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		05/21/20 13:38	05/26/20 15:49	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	110		10	3.1	mg/L			05/26/20 14:14	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			06/03/20 02:15	1

Client Sample ID: SHM-05-40X-SPR20

Lab Sample ID: 680-184026-12
Date Collected: 05/19/20 11:15
Matrix: Water
Date Received: 05/20/20 09:30

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27		2.5	1.0	mg/L			05/29/20 23:09	5
Sulfate	3.1	J	5.0	2.0	mg/L			05/29/20 23:09	5

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	23000		50	17	ug/L		05/21/20 13:38	05/22/20 21:10	1
Manganese	700		10	1.0	ug/L		05/21/20 13:38	05/22/20 21:10	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		05/21/20 13:38	05/26/20 15:46	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	110		10	3.1	mg/L			05/26/20 14:38	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			06/03/20 02:34	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: SHM-07-05X-SPR20

Lab Sample ID: 680-184026-13

Date Collected: 05/18/20 16:25
Date Received: 05/20/20 09:30

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	46		0.50	0.20	mg/L			05/30/20 04:57	1
Sulfate	2.3		1.0	0.40	mg/L			05/30/20 04:57	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	3400		50	17	ug/L		05/21/20 13:38	05/22/20 21:00	1
Manganese	74		10	1.0	ug/L		05/21/20 13:38	05/22/20 21:00	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	15		3.0	1.5	ug/L		05/21/20 13:38	05/26/20 15:40	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	30		10	3.1	mg/L			05/26/20 14:47	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			06/03/20 02:49	1

Client Sample ID: SHM-11-02-SPR20

Lab Sample ID: 680-184026-14

Date Collected: 05/19/20 15:50
Date Received: 05/20/20 09:30

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	44		0.50	0.20	mg/L			05/30/20 05:10	1
Sulfate	1.4		1.0	0.40	mg/L			05/30/20 05:10	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	12000		50	17	ug/L		05/21/20 13:38	05/22/20 21:05	1
Manganese	880		10	1.0	ug/L		05/21/20 13:38	05/22/20 21:05	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		05/21/20 13:38	05/26/20 15:43	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	220		10	3.1	mg/L			05/26/20 14:52	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			06/03/20 03:08	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: SHM-13-06-SPR20

Lab Sample ID: 680-184026-15

Date Collected: 05/19/20 08:55
Date Received: 05/20/20 09:30

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	95		2.5	1.0	mg/L			05/29/20 23:22	5
Sulfate	2.7	J	5.0	2.0	mg/L			05/29/20 23:22	5

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	22000		50	17	ug/L		05/26/20 11:14	05/27/20 18:12	1
Manganese	1200		10	1.0	ug/L		05/26/20 11:14	05/27/20 18:12	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2900		3.0	1.5	ug/L		05/26/20 11:14	05/27/20 09:06	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	57		10	3.1	mg/L			05/26/20 14:57	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			06/03/20 03:24	1

Client Sample ID: SHM-96-5B-SPR20

Lab Sample ID: 680-184026-16

Date Collected: 05/19/20 13:40
Date Received: 05/20/20 09:30

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	30		2.5	1.0	mg/L			05/29/20 23:35	5
Sulfate	17		5.0	2.0	mg/L			05/29/20 23:35	5

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	15000		50	17	ug/L		05/21/20 13:38	05/22/20 20:42	1
Manganese	8000		10	1.0	ug/L		05/21/20 13:38	05/22/20 20:42	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		05/21/20 13:38	05/26/20 15:35	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	210		10	3.1	mg/L			05/26/20 15:02	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			06/03/20 03:43	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: SHP-2016-1B-SPR20

Lab Sample ID: 680-184026-17

Date Collected: 05/19/20 09:00
Matrix: Water
Date Received: 05/20/20 09:30

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			05/30/20 05:23	1
Sulfate	2.2		1.0	0.40	mg/L			05/30/20 05:23	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	15000		50	17	ug/L		05/21/20 13:38	05/22/20 20:46	1
Manganese	840		10	1.0	ug/L		05/21/20 13:38	05/22/20 20:46	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		05/21/20 13:38	05/26/20 15:37	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	66		10	3.1	mg/L			05/26/20 15:06	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			06/03/20 04:04	1

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 680-620268/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620268

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.20	U	0.50	0.20	mg/L			05/28/20 10:16	1
Sulfate	0.40	U M	1.0	0.40	mg/L			05/28/20 10:16	1

Lab Sample ID: LCS 680-620268/5 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620268

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	10.5		mg/L		105	87 - 112

Lab Sample ID: LCSD 680-620268/6 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620268

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	10.4		mg/L		104	87 - 112	1	15

Lab Sample ID: 680-184026-1 MS — **Client Sample ID: EPA-PZ-2012-1A-SPR20**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620268

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	15		10.0	25.6		mg/L		101	87 - 111
Sulfate	1.2		10.0	11.7		mg/L		104	87 - 112

Lab Sample ID: 680-184026-1 MSD — **Client Sample ID: EPA-PZ-2012-1A-SPR20**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620268

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	15		10.0	25.9		mg/L		104	87 - 111	1	15
Sulfate	1.2		10.0	12.0		mg/L		108	87 - 112	3	15

Lab Sample ID: MB 680-620463/2 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620463

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.20	U	0.50	0.20	mg/L			05/29/20 14:11	1
Sulfate	0.40	U	1.0	0.40	mg/L			05/29/20 14:11	1

Lab Sample ID: LCS 680-620463/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620463

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.84	M	mg/L		98	87 - 111
Sulfate	10.0	9.99		mg/L		100	87 - 112

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: LCSD 680-620463/4 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620463

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	9.99		mg/L		100	87 - 112	0	15

Lab Sample ID: 680-184026-9 MS — **Client Sample ID: SHL-19-SPR20**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620463

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	0.31	J	10.0	10.1		mg/L		98	87 - 111		
Sulfate	3.2		10.0	13.4		mg/L		102	87 - 112		

Lab Sample ID: 680-184026-9 MSD — **Client Sample ID: SHL-19-SPR20**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620463

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	0.31	J	10.0	10.2		mg/L		99	87 - 111	1	15
Sulfate	3.2		10.0	13.4		mg/L		102	87 - 112	0	15

Lab Sample ID: MB 680-620512/33 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620512

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.20	U	0.50	0.20	mg/L			05/30/20 03:01	1
Sulfate	0.40	U	1.0	0.40	mg/L			05/30/20 03:01	1

Lab Sample ID: LCS 680-620512/34 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620512

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	9.67		mg/L		97	87 - 112		

Lab Sample ID: LCSD 680-620512/35 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 620512

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	1	15
Sulfate			10.0	9.73		mg/L		97	87 - 112	1	15

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-619560/1-A
Matrix: Water
Analysis Batch: 619792

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 619560

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		05/21/20 13:38	05/22/20 20:05	1
Manganese	1.0	U	10	1.0	ug/L		05/21/20 13:38	05/22/20 20:05	1

Lab Sample ID: LCS 680-619560/2-A
Matrix: Water
Analysis Batch: 619792

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 619560

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5010	4910		ug/L		98	87 - 115
Manganese	400	392		ug/L		98	90 - 114

Lab Sample ID: MB 680-619912/1-A
Matrix: Water
Analysis Batch: 620265

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 619912

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		05/26/20 11:14	05/27/20 16:16	1
Manganese	1.0	U	10	1.0	ug/L		05/26/20 11:14	05/27/20 16:16	1

Lab Sample ID: LCS 680-619912/2-A
Matrix: Water
Analysis Batch: 620265

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 619912

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5010	4840		ug/L		97	87 - 115
Manganese	400	394		ug/L		98	90 - 114

Lab Sample ID: MB 680-620661/1-A
Matrix: Water
Analysis Batch: 620833

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 620661

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	17	U	50	17	ug/L		06/01/20 10:31	06/01/20 23:33	1
Manganese	1.0	U	10	1.0	ug/L		06/01/20 10:31	06/01/20 23:33	1

Lab Sample ID: LCS 680-620661/2-A
Matrix: Water
Analysis Batch: 620833

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 620661

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5010	4940		ug/L		99	87 - 115
Manganese	400	383		ug/L		96	90 - 114

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-619559/1-A
Matrix: Water
Analysis Batch: 620003

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 619559

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.5	U	3.0	1.5	ug/L		05/21/20 13:38	05/26/20 14:56	1

Lab Sample ID: LCS 680-619559/2-A
Matrix: Water
Analysis Batch: 620003

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 619559

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	101		ug/L		101	84 - 116

Lab Sample ID: MB 680-619904/1-A
Matrix: Water
Analysis Batch: 620074

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 619904

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.5	U	3.0	1.5	ug/L		05/26/20 11:14	05/27/20 10:50	1

Lab Sample ID: LCS 680-619904/2-A
Matrix: Water
Analysis Batch: 620074

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 619904

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	108		ug/L		108	84 - 116

Lab Sample ID: MB 680-620660/1-A
Matrix: Water
Analysis Batch: 621011

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 620660

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.5	U	3.0	1.5	ug/L		06/01/20 10:31	06/02/20 17:51	1

Lab Sample ID: LCS 680-620660/2-A
Matrix: Water
Analysis Batch: 621011

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 620660

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	107		ug/L		107	84 - 116

Method: 9060A - Organic Carbon, Dissolved (DOC)

Lab Sample ID: MB 280-497282/35
Matrix: Water
Analysis Batch: 497282

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			06/03/20 00:23	1

Method: 9060A - Organic Carbon, Dissolved (DOC) (Continued)

Lab Sample ID: MB 280-497282/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

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			06/02/20 15:49	1

Lab Sample ID: LCS 280-497282/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	25.0	25.9		mg/L		104	88 - 112

Lab Sample ID: LCS 280-497282/34 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	25.0	26.9		mg/L		107	88 - 112

Lab Sample ID: 680-184026-10 MS — **Client Sample ID: SHL-DUP05-SPR20**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	2.6		25.0	29.4		mg/L		107	88 - 112

Lab Sample ID: 680-184026-10 MSD — **Client Sample ID: SHL-DUP05-SPR20**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 497282

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	29.5		mg/L		107	88 - 112	0	15

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 280-496256/31 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 496256

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	3.1	U	10	3.1	mg/L			05/26/20 12:24	1

Lab Sample ID: MB 280-496256/58 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 496256

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	3.1	U	10	3.1	mg/L			05/26/20 14:34	1

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: LCS 280-496256/30
Matrix: Water
Analysis Batch: 496256

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Alkalinity			200	208		mg/L		104	89 - 109		

Lab Sample ID: LCS 280-496256/57
Matrix: Water
Analysis Batch: 496256

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Alkalinity			200	209		mg/L		105	89 - 109		

Lab Sample ID: 680-184026-12 DU
Matrix: Water
Analysis Batch: 496256

Client Sample ID: SHM-05-40X-SPR20
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity	110			112		mg/L				0.2	10

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

HPLC/IC

Analysis Batch: 620268

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-1	EPA-PZ-2012-1A-SPR20	Total/NA	Water	9056A	
680-184026-2	EPA-PZ-2012-1B-SPR20	Total/NA	Water	9056A	
680-184026-3	EPA-PZ-2012-2A-SPR20	Total/NA	Water	9056A	
680-184026-4	EPA-PZ-2012-4A-SPR20	Total/NA	Water	9056A	
MB 680-620268/4	Method Blank	Total/NA	Water	9056A	
LCS 680-620268/5	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-620268/6	Lab Control Sample Dup	Total/NA	Water	9056A	
680-184026-1 MS	EPA-PZ-2012-1A-SPR20	Total/NA	Water	9056A	
680-184026-1 MSD	EPA-PZ-2012-1A-SPR20	Total/NA	Water	9056A	

Analysis Batch: 620463

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-5	EPA-PZ-2012-4B-SPR20	Total/NA	Water	9056A	
680-184026-9	SHL-19-SPR20	Total/NA	Water	9056A	
680-184026-10	SHL-DUP05-SPR20	Total/NA	Water	9056A	
680-184026-11	SHL-DUP06-SPR20	Total/NA	Water	9056A	
680-184026-12	SHM-05-40X-SPR20	Total/NA	Water	9056A	
680-184026-15	SHM-13-06-SPR20	Total/NA	Water	9056A	
680-184026-16	SHM-96-5B-SPR20	Total/NA	Water	9056A	
MB 680-620463/2	Method Blank	Total/NA	Water	9056A	
LCS 680-620463/3	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-620463/4	Lab Control Sample Dup	Total/NA	Water	9056A	
680-184026-9 MS	SHL-19-SPR20	Total/NA	Water	9056A	
680-184026-9 MSD	SHL-19-SPR20	Total/NA	Water	9056A	

Analysis Batch: 620512

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-6	PZ-12-05-SPR20	Total/NA	Water	9056A	
680-184026-7	PZ-12-08-SPR20	Total/NA	Water	9056A	
680-184026-8	SHL-10-SPR20	Total/NA	Water	9056A	
680-184026-13	SHM-07-05X-SPR20	Total/NA	Water	9056A	
680-184026-14	SHM-11-02-SPR20	Total/NA	Water	9056A	
680-184026-17	SHP-2016-1B-SPR20	Total/NA	Water	9056A	
MB 680-620512/33	Method Blank	Total/NA	Water	9056A	
LCS 680-620512/34	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-620512/35	Lab Control Sample Dup	Total/NA	Water	9056A	

Metals

Prep Batch: 619559

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-1	EPA-PZ-2012-1A-SPR20	Dissolved	Water	3005A	
680-184026-2	EPA-PZ-2012-1B-SPR20	Dissolved	Water	3005A	
680-184026-4	EPA-PZ-2012-4A-SPR20	Dissolved	Water	3005A	
680-184026-5	EPA-PZ-2012-4B-SPR20	Dissolved	Water	3005A	
680-184026-6	PZ-12-05-SPR20	Dissolved	Water	3005A	
680-184026-11	SHL-DUP06-SPR20	Dissolved	Water	3005A	
680-184026-12	SHM-05-40X-SPR20	Dissolved	Water	3005A	
680-184026-13	SHM-07-05X-SPR20	Dissolved	Water	3005A	
680-184026-14	SHM-11-02-SPR20	Dissolved	Water	3005A	
680-184026-16	SHM-96-5B-SPR20	Dissolved	Water	3005A	

Metals (Continued)

Prep Batch: 619559 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-17	SHP-2016-1B-SPR20	Dissolved	Water	3005A	
MB 680-619559/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-619559/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 619560

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-1	EPA-PZ-2012-1A-SPR20	Dissolved	Water	3005A	
680-184026-2	EPA-PZ-2012-1B-SPR20	Dissolved	Water	3005A	
680-184026-4	EPA-PZ-2012-4A-SPR20	Dissolved	Water	3005A	
680-184026-5	EPA-PZ-2012-4B-SPR20	Dissolved	Water	3005A	
680-184026-6	PZ-12-05-SPR20	Dissolved	Water	3005A	
680-184026-11	SHL-DUP06-SPR20	Dissolved	Water	3005A	
680-184026-12	SHM-05-40X-SPR20	Dissolved	Water	3005A	
680-184026-13	SHM-07-05X-SPR20	Dissolved	Water	3005A	
680-184026-14	SHM-11-02-SPR20	Dissolved	Water	3005A	
680-184026-16	SHM-96-5B-SPR20	Dissolved	Water	3005A	
680-184026-17	SHP-2016-1B-SPR20	Dissolved	Water	3005A	
MB 680-619560/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-619560/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 619792

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-1	EPA-PZ-2012-1A-SPR20	Dissolved	Water	6010C	619560
680-184026-2	EPA-PZ-2012-1B-SPR20	Dissolved	Water	6010C	619560
680-184026-4	EPA-PZ-2012-4A-SPR20	Dissolved	Water	6010C	619560
680-184026-5	EPA-PZ-2012-4B-SPR20	Dissolved	Water	6010C	619560
680-184026-6	PZ-12-05-SPR20	Dissolved	Water	6010C	619560
680-184026-11	SHL-DUP06-SPR20	Dissolved	Water	6010C	619560
680-184026-12	SHM-05-40X-SPR20	Dissolved	Water	6010C	619560
680-184026-13	SHM-07-05X-SPR20	Dissolved	Water	6010C	619560
680-184026-14	SHM-11-02-SPR20	Dissolved	Water	6010C	619560
680-184026-16	SHM-96-5B-SPR20	Dissolved	Water	6010C	619560
680-184026-17	SHP-2016-1B-SPR20	Dissolved	Water	6010C	619560
MB 680-619560/1-A	Method Blank	Total Recoverable	Water	6010C	619560
LCS 680-619560/2-A	Lab Control Sample	Total Recoverable	Water	6010C	619560

Prep Batch: 619904

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-3	EPA-PZ-2012-2A-SPR20	Dissolved	Water	3005A	
680-184026-7	PZ-12-08-SPR20	Dissolved	Water	3005A	
680-184026-8	SHL-10-SPR20	Dissolved	Water	3005A	
680-184026-10	SHL-DUP05-SPR20	Dissolved	Water	3005A	
680-184026-15	SHM-13-06-SPR20	Dissolved	Water	3005A	
MB 680-619904/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-619904/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 619912

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-3	EPA-PZ-2012-2A-SPR20	Dissolved	Water	3005A	
680-184026-7	PZ-12-08-SPR20	Dissolved	Water	3005A	
680-184026-8	SHL-10-SPR20	Dissolved	Water	3005A	

Metals (Continued)

Prep Batch: 619912 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-10	SHL-DUP05-SPR20	Dissolved	Water	3005A	
680-184026-15	SHM-13-06-SPR20	Dissolved	Water	3005A	
MB 680-619912/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-619912/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 620003

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-1	EPA-PZ-2012-1A-SPR20	Dissolved	Water	6020A	619559
680-184026-2	EPA-PZ-2012-1B-SPR20	Dissolved	Water	6020A	619559
680-184026-4	EPA-PZ-2012-4A-SPR20	Dissolved	Water	6020A	619559
680-184026-5	EPA-PZ-2012-4B-SPR20	Dissolved	Water	6020A	619559
680-184026-6	PZ-12-05-SPR20	Dissolved	Water	6020A	619559
680-184026-11	SHL-DUP06-SPR20	Dissolved	Water	6020A	619559
680-184026-12	SHM-05-40X-SPR20	Dissolved	Water	6020A	619559
680-184026-13	SHM-07-05X-SPR20	Dissolved	Water	6020A	619559
680-184026-14	SHM-11-02-SPR20	Dissolved	Water	6020A	619559
680-184026-16	SHM-96-5B-SPR20	Dissolved	Water	6020A	619559
680-184026-17	SHP-2016-1B-SPR20	Dissolved	Water	6020A	619559
MB 680-619559/1-A	Method Blank	Total Recoverable	Water	6020A	619559
LCS 680-619559/2-A	Lab Control Sample	Total Recoverable	Water	6020A	619559

Analysis Batch: 620074

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-3	EPA-PZ-2012-2A-SPR20	Dissolved	Water	6020A	619904
680-184026-7	PZ-12-08-SPR20	Dissolved	Water	6020A	619904
680-184026-8	SHL-10-SPR20	Dissolved	Water	6020A	619904
680-184026-10	SHL-DUP05-SPR20	Dissolved	Water	6020A	619904
680-184026-15	SHM-13-06-SPR20	Dissolved	Water	6020A	619904
MB 680-619904/1-A	Method Blank	Total Recoverable	Water	6020A	619904
LCS 680-619904/2-A	Lab Control Sample	Total Recoverable	Water	6020A	619904

Analysis Batch: 620265

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-3	EPA-PZ-2012-2A-SPR20	Dissolved	Water	6010C	619912
680-184026-7	PZ-12-08-SPR20	Dissolved	Water	6010C	619912
680-184026-8	SHL-10-SPR20	Dissolved	Water	6010C	619912
680-184026-10	SHL-DUP05-SPR20	Dissolved	Water	6010C	619912
680-184026-15	SHM-13-06-SPR20	Dissolved	Water	6010C	619912
MB 680-619912/1-A	Method Blank	Total Recoverable	Water	6010C	619912
LCS 680-619912/2-A	Lab Control Sample	Total Recoverable	Water	6010C	619912

Prep Batch: 620660

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-9	SHL-19-SPR20	Dissolved	Water	3005A	
MB 680-620660/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-620660/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 620661

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-9	SHL-19-SPR20	Dissolved	Water	3005A	
MB 680-620661/1-A	Method Blank	Total Recoverable	Water	3005A	

Metals (Continued)

Prep Batch: 620661 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 680-620661/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 620833

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-9	SHL-19-SPR20	Dissolved	Water	6010C	620661
MB 680-620661/1-A	Method Blank	Total Recoverable	Water	6010C	620661
LCS 680-620661/2-A	Lab Control Sample	Total Recoverable	Water	6010C	620661

Analysis Batch: 621011

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-9	SHL-19-SPR20	Dissolved	Water	6020A	620660
MB 680-620660/1-A	Method Blank	Total Recoverable	Water	6020A	620660
LCS 680-620660/2-A	Lab Control Sample	Total Recoverable	Water	6020A	620660

General Chemistry

Analysis Batch: 496256

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-1	EPA-PZ-2012-1A-SPR20	Total/NA	Water	SM 2320B	
680-184026-2	EPA-PZ-2012-1B-SPR20	Total/NA	Water	SM 2320B	
680-184026-3	EPA-PZ-2012-2A-SPR20	Total/NA	Water	SM 2320B	
680-184026-4	EPA-PZ-2012-4A-SPR20	Total/NA	Water	SM 2320B	
680-184026-5	EPA-PZ-2012-4B-SPR20	Total/NA	Water	SM 2320B	
680-184026-6	PZ-12-05-SPR20	Total/NA	Water	SM 2320B	
680-184026-7	PZ-12-08-SPR20	Total/NA	Water	SM 2320B	
680-184026-8	SHL-10-SPR20	Total/NA	Water	SM 2320B	
680-184026-9	SHL-19-SPR20	Total/NA	Water	SM 2320B	
680-184026-10	SHL-DUP05-SPR20	Total/NA	Water	SM 2320B	
680-184026-11	SHL-DUP06-SPR20	Total/NA	Water	SM 2320B	
680-184026-12	SHM-05-40X-SPR20	Total/NA	Water	SM 2320B	
680-184026-13	SHM-07-05X-SPR20	Total/NA	Water	SM 2320B	
680-184026-14	SHM-11-02-SPR20	Total/NA	Water	SM 2320B	
680-184026-15	SHM-13-06-SPR20	Total/NA	Water	SM 2320B	
680-184026-16	SHM-96-5B-SPR20	Total/NA	Water	SM 2320B	
680-184026-17	SHP-2016-1B-SPR20	Total/NA	Water	SM 2320B	
MB 280-496256/31	Method Blank	Total/NA	Water	SM 2320B	
MB 280-496256/58	Method Blank	Total/NA	Water	SM 2320B	
LCS 280-496256/30	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 280-496256/57	Lab Control Sample	Total/NA	Water	SM 2320B	
680-184026-12 DU	SHM-05-40X-SPR20	Total/NA	Water	SM 2320B	

Analysis Batch: 497282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-1	EPA-PZ-2012-1A-SPR20	Dissolved	Water	9060A	
680-184026-2	EPA-PZ-2012-1B-SPR20	Dissolved	Water	9060A	
680-184026-3	EPA-PZ-2012-2A-SPR20	Dissolved	Water	9060A	
680-184026-4	EPA-PZ-2012-4A-SPR20	Dissolved	Water	9060A	
680-184026-5	EPA-PZ-2012-4B-SPR20	Dissolved	Water	9060A	
680-184026-6	PZ-12-05-SPR20	Dissolved	Water	9060A	
680-184026-7	PZ-12-08-SPR20	Dissolved	Water	9060A	
680-184026-8	SHL-10-SPR20	Dissolved	Water	9060A	

General Chemistry (Continued)

Analysis Batch: 497282 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-184026-9	SHL-19-SPR20	Dissolved	Water	9060A	
680-184026-10	SHL-DUP05-SPR20	Dissolved	Water	9060A	
680-184026-11	SHL-DUP06-SPR20	Dissolved	Water	9060A	
680-184026-12	SHM-05-40X-SPR20	Dissolved	Water	9060A	
680-184026-13	SHM-07-05X-SPR20	Dissolved	Water	9060A	
680-184026-14	SHM-11-02-SPR20	Dissolved	Water	9060A	
680-184026-15	SHM-13-06-SPR20	Dissolved	Water	9060A	
680-184026-16	SHM-96-5B-SPR20	Dissolved	Water	9060A	
680-184026-17	SHP-2016-1B-SPR20	Dissolved	Water	9060A	
MB 280-497282/35	Method Blank	Dissolved	Water	9060A	
MB 280-497282/4	Method Blank	Dissolved	Water	9060A	
LCS 280-497282/3	Lab Control Sample	Dissolved	Water	9060A	
LCS 280-497282/34	Lab Control Sample	Dissolved	Water	9060A	
680-184026-10 MS	SHL-DUP05-SPR20	Dissolved	Water	9060A	
680-184026-10 MSD	SHL-DUP05-SPR20	Dissolved	Water	9060A	

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: EPA-PZ-2012-1A-SPR20

Lab Sample ID: 680-184026-1

Date Collected: 05/19/20 13:30
Matrix: Water
Date Received: 05/20/20 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	620268	05/28/20 17:19	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	619560	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619792	05/22/20 21:33	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619559	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620003	05/26/20 16:05	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 21:00	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 13:15	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: EPA-PZ-2012-1B-SPR20

Lab Sample ID: 680-184026-2

Date Collected: 05/19/20 15:35
Matrix: Water
Date Received: 05/20/20 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	620268	05/28/20 16:03	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	619560	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619792	05/22/20 21:28	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619559	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620003	05/26/20 16:02	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 21:23	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 13:33	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: EPA-PZ-2012-2A-SPR20

Lab Sample ID: 680-184026-3

Date Collected: 05/19/20 15:25
Matrix: Water
Date Received: 05/20/20 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	620268	05/28/20 16:16	UI	TAL SAV
	Instrument ID: CICK									
Dissolved	Prep	3005A			50 mL	50 mL	619912	05/26/20 11:14	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620265	05/27/20 18:07	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619904	05/26/20 11:14	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620074	05/27/20 09:04	BJB	TAL SAV
	Instrument ID: ICPMSD									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: EPA-PZ-2012-2A-SPR20 — Lab Sample ID: 680-184026-3

Date Collected: 05/19/20 15:25 — **Matrix: Water**
Date Received: 05/20/20 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	497282	06/02/20 21:39	JMB	TAL DEN
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 13:38	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: EPA-PZ-2012-4A-SPR20 — Lab Sample ID: 680-184026-4

Date Collected: 05/19/20 10:15 — **Matrix: Water**
Date Received: 05/20/20 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	620268	05/28/20 17:57	UI	TAL SAV
	Instrument ID:	CICK								
Dissolved	Prep	3005A			50 mL	50 mL	619560	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619792	05/22/20 21:19	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	619559	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620003	05/26/20 15:51	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 21:56	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 13:43	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: EPA-PZ-2012-4B-SPR20 — Lab Sample ID: 680-184026-5

Date Collected: 05/19/20 11:30 — **Matrix: Water**
Date Received: 05/20/20 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	620463	05/30/20 00:52	CS	TAL SAV
	Instrument ID:	CICH								
Dissolved	Prep	3005A			50 mL	50 mL	619560	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619792	05/22/20 21:37	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	619559	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620003	05/26/20 16:08	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 22:45	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 13:47	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: PZ-12-05-SPR20

Lab Sample ID: 680-184026-6
Date Collected: 05/18/20 16:15
Matrix: Water
Date Received: 05/20/20 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	620512	05/30/20 04:18	CS	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619560	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619792	05/22/20 21:23	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619559	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620003	05/26/20 15:54	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 23:01	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 13:52	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: PZ-12-08-SPR20

Lab Sample ID: 680-184026-7
Date Collected: 05/19/20 10:05
Matrix: Water
Date Received: 05/20/20 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	620512	05/30/20 04:31	CS	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619912	05/26/20 11:14	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620265	05/27/20 18:25	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619904	05/26/20 11:14	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620074	05/27/20 09:20	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 23:18	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 13:56	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHL-10-SPR20

Lab Sample ID: 680-184026-8
Date Collected: 05/19/20 14:05
Matrix: Water
Date Received: 05/20/20 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	620512	05/30/20 04:44	CS	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619912	05/26/20 11:14	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620265	05/27/20 18:21	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619904	05/26/20 11:14	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620074	05/27/20 09:18	BJB	TAL SAV
	Instrument ID: ICPMSD									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: SHL-10-SPR20

Lab Sample ID: 680-184026-8
Date Collected: 05/19/20 14:05
Matrix: Water
Date Received: 05/20/20 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	497282	06/02/20 23:35	JMB	TAL DEN
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 14:01	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHL-19-SPR20

Lab Sample ID: 680-184026-9
Date Collected: 05/19/20 12:00
Matrix: Water
Date Received: 05/20/20 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	620463	05/29/20 21:13	CS	TAL SAV
	Instrument ID:	CICH								
Dissolved	Prep	3005A			50 mL	50 mL	620661	06/01/20 10:31	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620833	06/02/20 00:06	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	620660	06/01/20 10:31	AJR	TAL SAV
Dissolved	Analysis	6020A		1			621011	06/02/20 18:46	BWR	TAL SAV
	Instrument ID:	ICPMSC								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/02/20 23:50	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 14:05	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHL-DUP05-SPR20

Lab Sample ID: 680-184026-10
Date Collected: 05/19/20 00:00
Matrix: Water
Date Received: 05/20/20 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	620463	05/30/20 01:05	CS	TAL SAV
	Instrument ID:	CICH								
Dissolved	Prep	3005A			50 mL	50 mL	619912	05/26/20 11:14	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620265	05/27/20 18:16	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	619904	05/26/20 11:14	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620074	05/27/20 09:15	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/03/20 00:55	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 14:10	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: SHL-DUP06-SPR20

Lab Sample ID: 680-184026-11

Date Collected: 05/19/20 10:00
Matrix: Water
Date Received: 05/20/20 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	620463	05/29/20 22:56	CS	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619560	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619792	05/22/20 21:14	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619559	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620003	05/26/20 15:49	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/03/20 02:15	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 14:14	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHM-05-40X-SPR20

Lab Sample ID: 680-184026-12

Date Collected: 05/19/20 11:15
Matrix: Water
Date Received: 05/20/20 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	620463	05/29/20 23:09	CS	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619560	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619792	05/22/20 21:10	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619559	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620003	05/26/20 15:46	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/03/20 02:34	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 14:38	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHM-07-05X-SPR20

Lab Sample ID: 680-184026-13

Date Collected: 05/18/20 16:25
Matrix: Water
Date Received: 05/20/20 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	620512	05/30/20 04:57	CS	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619560	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619792	05/22/20 21:00	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619559	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620003	05/26/20 15:40	BJB	TAL SAV
	Instrument ID: ICPMSD									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: SHM-07-05X-SPR20
Lab Sample ID: 680-184026-13
Date Collected: 05/18/20 16:25
Matrix: Water
Date Received: 05/20/20 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	497282	06/03/20 02:49	JMB	TAL DEN
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 14:47	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHM-11-02-SPR20
Lab Sample ID: 680-184026-14
Date Collected: 05/19/20 15:50
Matrix: Water
Date Received: 05/20/20 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	620512	05/30/20 05:10	CS	TAL SAV
	Instrument ID:	CICH								
Dissolved	Prep	3005A			50 mL	50 mL	619560	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619792	05/22/20 21:05	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	619559	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620003	05/26/20 15:43	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/03/20 03:08	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 14:52	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Client Sample ID: SHM-13-06-SPR20
Lab Sample ID: 680-184026-15
Date Collected: 05/19/20 08:55
Matrix: Water
Date Received: 05/20/20 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	620463	05/29/20 23:22	CS	TAL SAV
	Instrument ID:	CICH								
Dissolved	Prep	3005A			50 mL	50 mL	619912	05/26/20 11:14	AJR	TAL SAV
Dissolved	Analysis	6010C		1			620265	05/27/20 18:12	BCB	TAL SAV
	Instrument ID:	ICPE								
Dissolved	Prep	3005A			50 mL	250 mL	619904	05/26/20 11:14	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620074	05/27/20 09:06	BJB	TAL SAV
	Instrument ID:	ICPMSD								
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/03/20 03:24	JMB	TAL DEN
	Instrument ID:	WC_SHI3								
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 14:57	SPG	TAL DEN
	Instrument ID:	WC-AT3								

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

Client Sample ID: SHM-96-5B-SPR20

Lab Sample ID: 680-184026-16

Date Collected: 05/19/20 13:40
Matrix: Water
Date Received: 05/20/20 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	620463	05/29/20 23:35	CS	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619560	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619792	05/22/20 20:42	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619559	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620003	05/26/20 15:35	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/03/20 03:43	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 15:02	SPG	TAL DEN
	Instrument ID: WC-AT3									

Client Sample ID: SHP-2016-1B-SPR20

Lab Sample ID: 680-184026-17

Date Collected: 05/19/20 09:00
Matrix: Water
Date Received: 05/20/20 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	620512	05/30/20 05:23	CS	TAL SAV
	Instrument ID: CICH									
Dissolved	Prep	3005A			50 mL	50 mL	619560	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6010C		1			619792	05/22/20 20:46	BCB	TAL SAV
	Instrument ID: ICPE									
Dissolved	Prep	3005A			50 mL	250 mL	619559	05/21/20 13:38	AJR	TAL SAV
Dissolved	Analysis	6020A		1			620003	05/26/20 15:37	BJB	TAL SAV
	Instrument ID: ICPMSD									
Dissolved	Analysis	9060A		1	20 mL	20 mL	497282	06/03/20 04:04	JMB	TAL DEN
	Instrument ID: WC_SHI3									
Total/NA	Analysis	SM 2320B		1			496256	05/26/20 15:06	SPG	TAL DEN
	Instrument ID: WC-AT3									

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: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

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: JV, LTM - SHL Spring 2020

Job ID: 680-184026-1

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
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

Boston #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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-SPR20	WG	5-19-20	1330	GO	X	X	X	X	X	EPA-PZ-2012-1A	N1	23.70	28.70		
2	EPA-PZ-2012-1B-SPR20	WG	5-19-20	1535	GO	X	X	X	X	X	EPA-PZ-2012-1B	N1	73.56	78.56		
3	EPA-PZ-2012-2A-SPR20	WG	5-19-20	1525	DB	X	X	X	X	X	EPA-PZ-2012-2A	N1	18.14	23.14		
4	EPA-PZ-2012-2B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-2B	N1	73.16	78.16		
5	EPA-PZ-2012-3A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-3A	N1	19.09	24.09		
6	EPA-PZ-2012-3B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-3B	N1	68.70	73.70		
7	EPA-PZ-2012-4A-SPR20	WG	5-19-20	1015	GO	X	X	X	X	X	EPA-PZ-2012-4A	N1	19.56	24.56		
8	EPA-PZ-2012-4B-SPR20	WG	5-19-20	1130	GO	X	X	X	X	X	EPA-PZ-2012-4B	N1	79.50	84.50		
9	EPA-PZ-2012-5A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-5A	N1	17.95	22.95		
10	EPA-PZ-2012-5B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-5B	N1	68.46	73.46		
11	EPA-PZ-2012-6A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-6A	N1	24.19	29.19		
12	EPA-PZ-2012-6B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-6B	N1	74.23	79.23		
13	EPA-PZ-2012-7A-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-7A	N1	23.87	28.87		
14	EPA-PZ-2012-7B-SPR20	WG				X	X	X	X	X	EPA-PZ-2012-7B	N1	58.82	63.82		
15	EW-01-SPR20	WG				X	X	X	X	X	EW-01	N1	60.00	85.00		
16	EW-04-SPR20	WG				X	X	X	X	X	EW-04	N1	70.00	95.00		
17	PZ-12-01-SPR20	WG				X	X	X	X	X	PZ-12-01	N1	24.00	34.00		
18	PZ-12-02-SPR20	WG				X	X	X	X	X	PZ-12-02	N1	24.00	34.00		

680-184026 Chain of Custody

Relinquished by: *(Signature)* [signature]
Date 5/19/20
Time 1700
Received by: *(Signature)* [signature] 5-19-20 1700
Devens eCOCs Spring 2020

Date
Time
Shipping Date: 5/20/2020 0930
Received by Laboratory: *(Signature, Date, Time)* & conditio [signature] 4.0/4.4 1.0/1.4

Boston #215

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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-12-03-SPR20	WG				X	X	X	X	X	PZ-12-03	N1	24.00	34.00		
20	PZ-12-04-SPR20	WG				X	X	X	X	X	PZ-12-04	N1	24.00	34.00		
21	PZ-12-05-SPR20	WG	5-18-20	1615	DC	X	X	X	X	X	PZ-12-05	N1	26.00	36.00		
22	PZ-12-06-SPR20	WG				X	X	X	X	X	PZ-12-06	N1	25.00	35.00		
23	PZ-12-07-SPR20	WG				X	X	X	X	X	PZ-12-07	N1	20.00	30.00		
24	PZ-12-08-SPR20	WG	5-19-20	1005	DC	X	X	X	X	X	PZ-12-08	N1	22.00	32.00		
25	PZ-12-09-SPR20	WG				X	X	X	X	X	PZ-12-09	MS1	20.00	30.00		
26	PZ-12-09-SPR20	WG				X	X	X	X	X	PZ-12-09	N1	20.00	30.00		
27	PZ-12-09-SPR20	WG				X	X	X	X	X	PZ-12-09	SD1	20.00	30.00		
28	PZ-12-10-SPR20	WG				X	X	X	X	X	PZ-12-10	N1	20.00	30.00		
29	SHL-10-SPR20	WG	5-19-20	1405	DC	X	X	X	X	X	SHL-10	N1	24.00	39.00		
30	SHL-11-SPR20	WG				X	X	X	X	X	SHL-11	N1	12.00	27.00		
31	SHL-19-SPR20	WG	5-19-20	1200	DC	X	X	X	X	X	SHL-19	N1	20.00	30.00		
32	SHL-20-SPR20	WG				X	X	X	X	X	SHL-20	N1	39.00	49.00		
33	SHL-4-SPR20	WG				X	X	X	X	X	SHL-4	N1	3.00	13.00		
34	SHL-DUP01-SPR20	WG				X	X	X	X	X	PZ-12-06	FD1	25.00	35.00		
35	SHL-DUP02-SPR20	WG				X	X	X	X	X	SHL-20	FD1	39.00	49.00		
36	SHL-DUP03-SPR20	WG				X	X	X	X	X	SHM-11-06	FD1	25.00	35.00		

Relinquished by: *(Signature)*
Date
Time
Received by: *(Signature)* 5-19-20 1700
Devens eCOCs Spring 2020

Date 5/20/2020
Time 0930
Shipping Date:
Received by Laboratory: *(Signature, Date, Time)* & conditio

4.0/4.4 1.0/1.4

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

Boston #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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-DUP04-SPR20	WG				X	X	X	X	X						SHP-01-38A	FD1	1.50	6.50		
38	SHL-DUP05-SPR20	WG	5-19-20	0000	GO	X	X	X	X	X						EPA-PZ-2012-4B	FD1	79.50	84.50		
39	SHL-DUP06-SPR20	WG	5-19-20	1000	DB	X	X	X	X	X						SHM-05-40X	FD1	32.00	34.00		
40	SHM-05-40X-SPR20	WG	5-19-20	1115	DB	X	X	X	X	X						SHM-05-40X	N1	32.00	34.00		
41	SHM-05-41B-SPR20	WG				X	X	X	X	X						SHM-05-41B	N1	62.00	64.00		
42	SHM-05-41C-SPR20	WG				X	X	X	X	X						SHM-05-41C	MS1	88.00	93.00		
43	SHM-05-41C-SPR20	WG				X	X	X	X	X						SHM-05-41C	N1	88.00	93.00		
44	SHM-05-41C-SPR20	WG				X	X	X	X	X						SHM-05-41C	SD1	88.00	93.00		
45	SHM-07-03-SPR20	WG				X	X	X	X	X						SHM-07-03	N1	25.00	35.00		
46	SHM-07-05X-SPR20	WG	5-18-20	1625	GO	X	X	X	X	X						SHM-07-05X	N1	55.00	65.00		
47	SHM-11-02-SPR20	WG	5-19-20	1550	DC	X	X	X	X	X						SHM-11-02	N1	52.00	66.00		
48	SHM-11-06-SPR20	WG				X	X	X	X	X						SHM-11-06	N1	25.00	35.00		
49	SHM-13-03-SPR20	WG				X	X	X	X	X						SHM-13-03	N1	42.00	52.00		
50	SHM-13-04-SPR20	WG				X	X	X	X	X						SHM-13-04	MS1	20.00	30.00		
51	SHM-13-04-SPR20	WG				X	X	X	X	X						SHM-13-04	N1	20.00	30.00		
52	SHM-13-04-SPR20	WG				X	X	X	X	X						SHM-13-04	SD1	20.00	30.00		
53	SHM-13-06-SPR20	WG	5-19-20	855	DB	X	X	X	X	X						SHM-13-06	N1	36.00	46.00		
54	SHM-13-07-SPR20	WG				X	X	X	X	X						SHM-13-07	N1	27.00	37.00		

Relinquished by: *(Signature)*
Date
Time
Received by: *(Signature)*
Devens eCOCs Spring 2020

5-18-20 1700

Date
Time
Shipping Date: 5/20/2020 0930

Received by Laboratory: *(Signature, Date, Time)* & conditio

4.0/4.4 1.0/1.4

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

Boston #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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						
55	SHM-13-08-SPR20	WG				X	X	X	X	X	SHM-13-08	N1	55.00	65.00		
56	SHM-93-22B-SPR20	WG				X	X	X	X	X	SHM-93-22B	N1	82.30	92.30		
57	SHM-96-5B-SPR20	WG	5-19-20	1340	DB	X	X	X	X	X	SHM-96-5B	N1	80.00	90.00		
58	SHP-01-36X-SPR20	WG				X	X	X	X	X	SHP-01-36X	N1	3.00	8.00		
59	SHP-01-37X-SPR20	WG				X	X	X	X	X	SHP-01-37X	N1	1.00	6.00		
60	SHP-01-38A-SPR20	WG				X	X	X	X	X	SHP-01-38A	N1	1.50	6.50		
61	SHP-2016-06A-SPR20	WG				X	X	X	X	X	SHP-2016-06A	N1	81.00	86.00		
62	SHP-2016-06B-SPR20	WG				X	X	X	X	X	SHP-2016-06B	N1	102.00	112.00		
63	SHP-2016-06C-SPR20	WG				X	X	X	X	X	SHP-2016-06C	N1	123.00	133.00		
64	SHP-2016-07A-SPR20	WG				X	X	X	X	X	SHP-2016-07A	N1	22.00	32.00		
65	SHP-2016-07B-SPR20	WG				X	X	X	X	X	SHP-2016-07B	N1	70.00	80.00		
66	SHP-2016-1A-SPR20	WG				X	X	X	X	X	SHP-2016-1A	N1	13.00	23.00		
67	SHP-2016-1B-SPR20	WG	5-19-20	900	GO	X	X	X	X	X	SHP-2016-1B	N1	75.00	85.00		
68	SHP-2016-2A-SPR20	WG				X	X	X	X	X	SHP-2016-2A	N1	20.00	25.00		
69	SHP-2016-2B-SPR20	WG				X	X	X	X	X	SHP-2016-2B	N1	80.00	85.00		
70	SHP-2016-3A-SPR20	WG				X	X	X	X	X	SHP-2016-3A	N1	20.00	25.00		
71	SHP-2016-3B-SPR20	WG				X	X	X	X	X	SHP-2016-3B	N1	80.00	85.00		
72	SHP-2016-4A-SPR20	WG				X	X	X	X	X	SHP-2016-4A	N1	25.00	30.00		

Relinquished by: *(Signature)*
Date
Time
Received by: *(Signature)*
Devens eCDCs Spring 2020

5-19-20 - 1700

Date
Time
Shipping Date: 5/20/2020 0930

Received by Laboratory: *(Signature, Date, Time)* & conditio

4/0/4.4 1.0/1.4

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Corey Caulkins
Arcadis U.S., Inc. 410 North 44th Street, Suite 1000 Phoenix, AZ 85008
United States

Boston #215

COC # SHL_5.14.202

ARCADIS

Project Name: Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: JV, Long Term Monitoring, SHL, Spring 2020
Project Number: DEVNS-LTM	POC: Jon Lawhon; 912-250-0283; jon.lawhon@testamericainc.com	
WBS Code:	Ship to: 5102 LaRoche Avenue, Savannah, GA 31404	

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: JV, Long Term Monitoring, SHL, Spring 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
73	SHP-2016-4B-SPR20	WG				X	X	X	X	X						SHP-2016-4B	N1	85.00	90.00		
74	SHP-2016-5A-SPR20	WG				X	X	X	X	X						SHP-2016-5A	N1	25.00	30.00		
75	SHP-2016-5B-SPR20	WG				X	X	X	X	X						SHP-2016-5B	N1	85.00	90.00		

Turnaround Time: NA

Relinquished by: *(Signature)*
Date
Time
Received by: *(Signature)* 5-19-20-1700
Devens eCOCs Spring 2020

Date
Time
Shipping Date: 5/20/2020 0930
Received by Laboratory: *(Signature, Date, Time)* & conditio

4.0/4.4 1.0/1.4

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: Lawhon, Jon K	Carrier Tracking No(s):	COC No: 680-611894.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jon.lawhon@testamericainc.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 #: 680-184026-1
Address: 4955 Yarrow Street, .	Due Date Requested: 6/1/2020			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: JV, LTM - SHL Spring 2020	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-2012-1A-SPR20 (680-184026-1)	5/19/20	13:30 Eastern		Water			X	X	2	
EPA-PZ-2012-1B-SPR20 (680-184026-2)	5/19/20	15:35 Eastern		Water			X	X	2	
EPA-PZ-2012-2A-SPR20 (680-184026-3)	5/19/20	15:25 Eastern		Water			X	X	2	
EPA-PZ-2012-4A-SPR20 (680-184026-4)	5/19/20	10:15 Eastern		Water			X	X	2	
EPA-PZ-2012-4B-SPR20 (680-184026-5)	5/19/20	11:30 Eastern		Water			X	X	2	
PZ-12-05-SPR20 (680-184026-6)	5/18/20	16:15 Eastern		Water			X	X	2	
PZ-12-08-SPR20 (680-184026-7)	5/19/20	10:05 Eastern		Water			X	X	2	
SHL-10-SPR20 (680-184026-8)	5/19/20	14:05 Eastern		Water			X	X	2	
SHL-19-SPR20 (680-184026-9)	5/19/20	12:00 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: 5-21-20 1600	Company TA	Received by:	Date/Time: 5/20/20 0920	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: 3.6, IR8, +0.6, DS, 5/22/20		

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: Lawhon, Jon K	Carrier Tracking No(s):	COC No: 680-611894.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: jon.lawhon@testamericainc.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 #: 680-184026-1
Address: 4955 Yarrow Street,	Due Date Requested: 6/1/2020			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: JV, LTM - SHL Spring 2020	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-DUP05-SPR20 (680-184026-10)	5/19/20	Eastern		Water			X	X	2	
SHL-DUP06-SPR20 (680-184026-11)	5/19/20	10:00 Eastern		Water			X	X	2	
SHM-05-40X-SPR20 (680-184026-12)	5/19/20	11:15 Eastern		Water			X	X	2	
SHM-07-05X-SPR20 (680-184026-13)	5/18/20	16:25 Eastern		Water			X	X	2	
SHM-11-02-SPR20 (680-184026-14)	5/19/20	15:50 Eastern		Water			X	X	2	
SHM-13-06-SPR20 (680-184026-15)	5/19/20	08:55 Eastern		Water			X	X	2	
SHM-96-5B-SPR20 (680-184026-16)	5/19/20	13:40 Eastern		Water			X	X	2	
SHP-2016-1B-SPR20 (680-184026-17)	5/19/20	09:00 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: 5-21-20 1600	Company TA	Received by:	Date/Time: 5/22/20 0720	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:		

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-184026-1

Login Number: 184026
List Number: 1
Creator: Laughlin, Paul 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").	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: 680-184026-1

Login Number: 184026
List Number: 2
Creator: Lubin, Julius C

List Source: Eurofins TestAmerica, Denver
List Creation: 05/22/20 12:37 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	

Attachment 3

Data Validation Report

Dissolved Metals
SW 846/6010C/6020A
USEPA Level II Review

Site: Former Fort Devens, MA 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 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 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 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 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 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.			

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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

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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

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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 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 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 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 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

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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 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 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

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Sovereign Consulting Inc.
16 Chestnut Street, Suite 520
Foxborough, MA 02035
ATTN: Mr. Steven Passafaro
spassafaro@sovcon.com

January 22, 2020

SUBJECT: Shepley's Hill, Data Validation

Dear Mr. Passafaro,

Enclosed is the final validation report for the fraction listed below. This SDG was received on January 16, 2020. Attachment 1 is a summary of the samples that were reviewed for analysis.

LDC Project #47083:

SDG #	**Fraction**
JD1172	Arsenic

The data validation was performed under Stage 2A guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts; March 2015
- USEPA National Functional Guidelines for Inorganic Superfund Data Review; January 2017
- 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

251 pages-ADV (no worksheets) Attachment 1

ADR (Stage 2A)	LDC #47083 (Sovereign Consulting, Inc., Foxborough, MA / Shepley's Hill)																																						
LDC	SDG#	DATE REC'D	(3) DATE DUE	As (6020B)																																			
Matrix:	Water/Sediment			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	JD1172	01/16/20	02/06/20	1	0																																		
Total	T/PG			1	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	0	0	0	0	0	0	1

Shaded cells indicate Stage 4 validation (all other cells are ADR review). These sample counts do not include MS, MSD, or DUP's.

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Data Validation Report
Shepley's Hill

SDG: JD1172

Prepared for

Sovereign Consulting
16 Chestnut Street, Suite 520
Foxborough, MA 02035

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, California 92010

January 21, 2020

INTRODUCTION

This Data Validation Report (DVR) presents Stage 2A data validation results for samples collected during the January 2020 sampling period. Data validation was performed in accordance with the Quality Assurance Project Plan (QAPP) for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts (March 2015), and the US Environmental Protection Agency (EPA) National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic by EPA SW 846 Method 6020B

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. Stage 2A Automated Data Review outliers are presented in Enclosure I.

All sample results were subjected to Stage 2A data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, and laboratory control samples (LCS), laboratory blanks.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013). Quality assurance (QA)/QC criteria specified in the QAPP and NFG were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

I. Sample Receipt and Technical Holding Time

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Laboratory Blanks

Laboratory blanks were performed as required by the methods. No contaminant concentrations were detected in the laboratory blanks reviewed by the ADR software program.

III. Field Blank Samples

No field blanks were identified in this SDG.

IV. Surrogate Spikes

Surrogate spikes were not required by the methods.

V. Matrix Spike

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed.

VI. Laboratory Duplicate Sample

The laboratory has indicated that there were no laboratory duplicate (DUP) analyses specified for the samples in this SDG, and therefore laboratory duplicate analyses were not performed for this SDG.

VII. Serial Dilution

Serial dilution was not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Field Duplicate Samples

No field duplicates were identified in this SDG.

X. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
03-Jan-2020	EFFLUENT	JD1172-1	N	3010A	6020B	S2AVE

N = Normal Sample *S2AVE = Stage 2A Validation*

Attachment 2

Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: JD1172

Laboratory: ACTD

EDD Filename: JD1172-SEDD_2a_1

eQAPP Name: Sovereign_Shepley'sHillLandfill_180924

No Data Review Qualifiers Applied.

Quality Control Outlier Reports

JD1172

(No Outliers)

LABORATORY DATA CONSULTANTS, INC.
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ATTN: Mr. Steven Passafaro
spassafaro@sovcon.com

February 28, 2020

SUBJECT: Shepley's Hill, Data Validation

Dear Mr. Passafaro,

Enclosed is the final validation report for the fraction listed below. This SDG was received on February 14, 2020. Attachment 1 is a summary of the samples that were reviewed for analysis.

LDC Project #47306:

SDG #	**Fraction**
JD2951	Arsenic

The data validation was performed under Stage 2A guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts; March 2015
- USEPA National Functional Guidelines for Inorganic Superfund Data Review; January 2017
- 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

196 pages-ADV (no worksheets) Attachment 1

ADR (Stage 2A) **LDC #47306 (Sovereign Consulting, Inc., Foxborough, MA / Shepley's Hill)**

LDC	SDG#	DATE REC'D	(3) DATE DUE	As (6020B)																																			
Matrix:	Water/Sediment			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	JD2951	02/14/20	03/09/20	1	0																																		
Total	T/PG			1	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	0	0	0	0	0	0	1

Shaded cells indicate Stage 4 validation (all other cells are ADR review). These sample counts do not include MS, MSD, or DUP's.

L:\Sovereign\Shepleys Hill\47306ST.wpd

Data Validation Report
Shepley's Hill

SDG: JD2951

Prepared for

Sovereign Consulting
16 Chestnut Street, Suite 520
Foxborough, MA 02035

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, California 92010

February 27, 2020

INTRODUCTION

This Data Validation Report (DVR) presents Stage 2A data validation results for samples collected during the February 2020 sampling period. Data validation was performed in accordance with the Quality Assurance Project Plan (QAPP) for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts (March 2015), and the US Environmental Protection Agency (EPA) National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic by EPA SW 846 Method 6020B

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. Stage 2A Automated Data Review outliers are presented in Enclosure I.

All sample results were subjected to Stage 2A data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, matrix spike/matrix spike duplicates (MS/MSD), laboratory control samples (LCS), and laboratory blanks.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013). Quality assurance (QA)/QC criteria specified in the QAPP and NFG were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

I. Sample Receipt and Technical Holding Time

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Laboratory Blanks

Laboratory blanks were performed as required by the methods. No contaminant concentrations were detected in the laboratory blanks reviewed by the ADR software program.

III. Field Blank Samples

No field blanks were identified in this SDG.

IV. Surrogate Spikes

Surrogate spikes were not required by the methods.

V. Matrix Spike

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VI. Laboratory Duplicate Sample

The laboratory has indicated that there were no laboratory duplicate (DUP) analyses specified for the samples in this SDG, and therefore laboratory duplicate analyses were not performed for this SDG.

VII. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Field Duplicate Samples

No field duplicates were identified in this SDG.

X. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
07-Feb-2020	EFFLEUNT	JD2951-1	N	3010A	6020B	S2AVE
07-Feb-2020	EFFLEUNTMS	MP19751-S1	MS	3010A	6020B	S2AVE
07-Feb-2020	EFFLEUNTMSD	MP19751-S2	MSD	3010A	6020B	S2AVE

N = Normal Sample MS = Matrix Spike MSD = Matrix Spike Duplicate
S2AVE = EPA Level II Validation

Attachment 2

Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: JD2951

Laboratory: ACTD

EDD Filename: JD2951-SEDD_2a_1

eQAPP Name: Sovereign_Shepley'sHillLandfill_180924

No Data Review Qualifiers Applied.

Enclosure I

Stage 2A ADR Outliers

Quality Control Outlier Reports

JD2951

(No Outliers)

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Sovereign Consulting Inc.
16 Chestnut Street, Suite 520
Foxborough, MA 02035
ATTN: Mr. Steven Passafaro
spassafaro@sovcon.com

April 15, 2020

SUBJECT: Shepley's Hill, Data Validation

Dear Mr. Passafaro,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on March 25, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #47638:

SDG #	**Fraction**
JD4297	Metals, Wet Chemistry

The data validation was performed under Stage 2A guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts; March 2015
- USEPA National Functional Guidelines for Inorganic Superfund Data Review; January 2017
- 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

922 pages-ADV (no worksheets) Attachment 1

ADR (Stage 2A)

LDC #47638 (Sovereign Consulting, Inc., Foxborough, MA / Shepley's Hill)

LDC	SDG#	DATE REC'D	(3) DATE DUE	(3) Metals (6010D)		Fe,Mn (6010D)		As (6020B)		Cl,SO_4 (300.0 /9056A)		NO_3N (353.2)		NO_3/ NO_2-N (353.2)																							
Matrix:	Water/Sediment			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	JD4297	03/25/20	04/15/20	1	0	2	0	3	0	1	0	1	0	1	0																						
Total	J/PG			1	0	2	0	3	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9

Shaded cells indicate Stage 4 validation (all other cells are ADR review). These sample counts do not include MS, MSD, or DUP's.

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Data Validation Report
Shepley's Hill

SDG: JD4297

Prepared for

Sovereign Consulting
16 Chestnut Street, Suite 520
Foxborough, MA 02035

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, California 92010

April 15, 2020

INTRODUCTION

This Data Validation Report (DVR) presents Stage 2A data validation results for samples collected during the March 2020 sampling period. Data validation was performed in accordance with the Quality Assurance Project Plan (QAPP) for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts (March 2015), and the US Environmental Protection Agency (EPA) National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Metals by EPA SW 846 Method 6010D and 6020B
Nitrate as Nitrogen and Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Chloride and Sulfate by EPA Method 300.0/SW 846 Method 9056A
Nitrite

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. Stage 2A Automated Data Review outliers are presented in Enclosure I.

All sample results were subjected to Stage 2A data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, laboratory control samples (LCS), and laboratory blanks.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013). Quality assurance (QA)/QC criteria specified in the QAPP and NFG were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

I. Sample Receipt and Technical Holding Time

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Laboratory Blanks

Laboratory blanks were performed as required by the methods. No contaminant concentrations were detected in the laboratory blanks reviewed by the ADR software program.

III. Field Blank Samples

No field blanks were identified in this SDG.

IV. Matrix Spike/Matrix Spike Duplicate

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the exception of one MS/MSD pair for arsenic. No data were qualified since sample concentrations were significantly greater (>4x) than the spike amount. The details are presented in Enclosure I.

V. Duplicate Sample Analysis

The laboratory has indicated that there were no laboratory duplicate (DUP) analyses specified for the samples in this SDG, and therefore laboratory duplicate analyses were not performed for this SDG.

VI. Serial Dilution

Serial dilution analysis was performed on an associated project sample. The analysis criteria were met with the following exceptions:

SDG/ Method	Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
JD4297/ 6020B	EW-4	Arsenic	25.9 (≤10)	EW-4	J (all detects)	A

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Field Duplicate Samples

No field duplicates were identified in this SDG.

IX. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

All compounds reported below the LOQ as detected by the laboratory were qualified as detected estimated (J). The details regarding the qualification of data are provided in Enclosure I.

X. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to serial dilution %D, data were qualified as estimated in one sample.

Due to results reported as detected below the LOQ, data was qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

Data flags are summarized and are presented as Attachment 2

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
06-Mar-2020	EFFLUENT	JD4297-1	N	3010A	6010D	S2AVE
06-Mar-2020	EFFLUENT	JD4297-1	N	3010A	6020B	S2AVE
06-Mar-2020	EFFLUENT	JD4297-1	N	Gen Prep	300.0	S2AVE
06-Mar-2020	EFFLUENT	JD4297-1	N	Gen Prep	353.2	S2AVE
06-Mar-2020	EFFLUENT	JD4297-1	N	Gen Prep	353.2_CALC	S2AVE
06-Mar-2020	EW-1	JD4297-2	N	3010A	6010D	S2AVE
06-Mar-2020	EW-1	JD4297-2	N	3010A	6020B	S2AVE
06-Mar-2020	EW-4	JD4297-3	N	3010A	6010D	S2AVE
06-Mar-2020	EW-4	JD4297-3	N	3010A	6020B	S2AVE
06-Mar-2020	EW-4MS	MP20175A-S3	MS	3010A	6020B	S2AVE
06-Mar-2020	EW-4MSD	MP20175A-S4	MSD	3010A	6020B	S2AVE
06-Mar-2020	EW-4MS	MP20175-S1	MS	3010A	6010D	S2AVE
06-Mar-2020	EW-4MSD	MP20175-S2	MSD	3010A	6010D	S2AVE

III = EPA Level 3 Data Review *N = Normal Sample* *TB = Trip Blank* *MS = Matrix Spike*
IV = EPA Level 4 Data Validation *FD = Field Duplicate* *FB = Field Blank* *MSD = Matrix Spike Duplicate*

Attachment 2

Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: JD4297 **Laboratory: ACTD**

EDD Filename: JD4297-SEDD_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Method Category: METALS

Method: 6010D ***Matrix:*** Water

Sample ID: EFFLUENT ***Collected:*** 3/6/2020 6:05:00 AM ***Analysis Type:*** Initial/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BARIUM	15.6	J	100	LOD	200	LOQ	ug/L	J	TR

Method Category: METALS

Method: 6020B ***Matrix:*** Water

Sample ID: EW-4 ***Collected:*** 3/6/2020 7:38:00 AM ***Analysis Type:*** Initial/TOT ***Dilution:*** 50

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ARSENIC	3670		50	LOD	75	LOQ	ug/L	J	SD

* denotes a non-reportable result

Project Name and Number: - USACE Project: Shepley's Hill (SHL), Devens, MA

Data Qualifier Summary

Lab Reporting Batch ID: JD4297 **Laboratory: ACTD**

EDD Filename: JD4297-SEDD_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Reason Code Legend

Reason Code	*Description*
PJ	Professional Judgment
Q	Matrix Spike Lower Rejection
SD	Professional Judgment
TR	Reporting Limit Trace Value

* denotes a non-reportable result

Project Name and Number: - USACE Project: Shepley's Hill (SHL), Devens, MA

Enclosure I

Stage 2A ADR Outliers

Quality Control Outlier Reports

JD4297

Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: JD4297 **Laboratory: ACTD**

EDD Filename: JD4297-SEDD_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Method: **6020B**
Matrix: **Water**

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
EW-4MS (Total) (EW-1 EW-4)	ARSENIC	-425	-	80.00-120.00	-	ARSENIC	No Qualifiers Applied Native > 4x

Project Name and Number: - USACE Project: Shepley's Hill (SHL), Devens, MA

Reporting Limit Outliers

Lab Reporting Batch ID: JD4297 **Laboratory: ACTD**

EDD Filename: JD4297-SEDD_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Method: **6010D**

Matrix: **Water**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
EFFLUENT	BARIUM	J	15.6	200	LOQ	ug/L	J (all detects)

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Sovereign Consulting Inc.
16 Chestnut Street, Suite 520
Foxborough, MA 02035
ATTN: Mr. Steven Passafaro
spassafaro@sovcon.com

April 28, 2020

SUBJECT: Shepley's Hill, Data Validation

Dear Mr. Passafaro,

Enclosed is the final validation report for the fraction listed below. This SDG was received on April 21, 2020. Attachment 1 is a summary of the samples that were reviewed for analysis.

LDC Project #47863:

SDG #	**Fraction**
JD5642	Arsenic

The data validation was performed under Stage 2A guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts; March 2015
- USEPA National Functional Guidelines for Inorganic Superfund Data Review; January 2017
- 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

51 pages-ADV (no worksheets) Attachment 1

ADR (Stage 2A) **LDC #47863 (Sovereign Consulting, Inc., Foxborough, MA / Shepley's Hill)**

LDC	SDG#	DATE REC'D	(3) DATE DUE	As (6020B)																																			
Matrix:	Water/Sediment			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	JD5642	04/21/20	05/12/20	1	0																																		
Total	T/PG			1	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	0	0	0	0	0	0	1

Shaded cells indicate Stage 4 validation (all other cells are ADR review). These sample counts do not include MS, MSD, or DUP's.

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Data Validation Report
Shepley's Hill

SDG: JD5642

Prepared for

Sovereign Consulting
16 Chestnut Street, Suite 520
Foxborough, MA 02035

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, California 92010

April 28, 2020

INTRODUCTION

This Data Validation Report (DVR) presents Stage 2A data validation results for samples collected during the April 2020 sampling period. Data validation was performed in accordance with the Quality Assurance Project Plan (QAPP) for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts (March 2015), and the US Environmental Protection Agency (EPA) National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic by EPA SW 846 Method 6020B

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. Stage 2A Automated Data Review outliers are presented in Enclosure I.

All sample results were subjected to Stage 2A data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, matrix spike/matrix spike duplicates (MS/MSD), laboratory control samples (LCS), serial dilutions, and laboratory blanks.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013). Quality assurance (QA)/QC criteria specified in the QAPP and NFG were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

I. Sample Receipt and Technical Holding Time

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Laboratory Blanks

Laboratory blanks were performed as required by the methods. No contaminant concentrations were detected in the laboratory blanks reviewed by the ADR software program.

III. Field Blank Samples

No field blanks were identified in this SDG.

IV. Surrogate Spikes

Surrogate spikes were not required by the methods.

V. Matrix Spike

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VI. Laboratory Duplicate Sample

The laboratory has indicated that there were no laboratory duplicate (DUP) analyses specified for the samples in this SDG, and therefore laboratory duplicate analyses were not performed for this SDG.

VII. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Field Duplicate Samples

No field duplicates were identified in this SDG.

X. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
03-Apr-2020	EFFLUENT	JD5642-1	N	3010A	6020B	S2AVE
03-Apr-2020	EFFLUENTMS	MP20630-S1	MS	3010A	6020B	S2AVE
03-Apr-2020	EFFLUENTMSD	MP20630-S2	MSD	3010A	6020B	S2AVE

N = Normal Sample MS = Matrix Spike MSD = Matrix Spike Duplicate
S2AVE = EPA Level II Validation

Attachment 2

Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: JD5642

Laboratory: ACTD

EDD Filename: JD5642-SEDD_2a_1

eQAPP Name: Sovereign_Shepley'sHillLandfill_180924

No Data Review Qualifiers Applied.

Enclosure I

Stage 2A ADR Outliers

Quality Control Outlier Reports

JD5642

(No Outliers)

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Sovereign Consulting Inc.
16 Chestnut Street, Suite 520
Foxborough, MA 02035
ATTN: Mr. Steven Passafaro
spassafaro@sovcon.com

June 3, 2020

SUBJECT: Shepley's Hill, Data Validation

Dear Mr. Passafaro,

Enclosed is the final validation report for the fraction listed below. This SDG was received on May 18, 2020. Attachment 1 is a summary of the samples that were reviewed for analysis.

LDC Project #48081:

SDG #	**Fraction**
JD7050	Arsenic

The data validation was performed under Stage 2A guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts; March 2015
- USEPA National Functional Guidelines for Inorganic Superfund Data Review; January 2017
- 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

44 pages-ADV (no worksheets) Attachment 1

ADR (Stage 2A) **LDC #48081 (Sovereign Consulting, Inc., Foxborough, MA / Shepley's Hill)**

LDC	SDG#	DATE REC'D	(3) DATE DUE	As (6020B)																																			
Matrix:	Water/Sediment			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	JD7050	05/18/20	06/09/20	1	0																																		
Total	T/PG			1	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	0	0	0	0	0	0	1

Shaded cells indicate Stage 4 validation (all other cells are ADR review). These sample counts do not include MS, MSD, or DUP's.

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Data Validation Report
Shepley's Hill

SDG: JD7050

Prepared for

Sovereign Consulting
16 Chestnut Street, Suite 520
Foxborough, MA 02035

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, California 92010

June 3, 2020

INTRODUCTION

This Data Validation Report (DVR) presents Stage 2A data validation results for samples collected during the May 2020 sampling period. Data validation was performed in accordance with the Quality Assurance Project Plan (QAPP) for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts (March 2015), and the US Environmental Protection Agency (EPA) National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic by EPA SW 846 Method 6020B

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. Stage 2A Automated Data Review outliers are presented in Enclosure I.

All sample results were subjected to Stage 2A data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, matrix spike/matrix spike duplicates (MS/MSD), laboratory control samples (LCS), serial dilutions, and laboratory blanks.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013). Quality assurance (QA)/QC criteria specified in the QAPP and NFG were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

I. Sample Receipt and Technical Holding Time

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Laboratory Blanks

Laboratory blanks were performed as required by the methods. No contaminant concentrations were detected in the laboratory blanks reviewed by the ADR software program.

III. Field Blank Samples

No field blanks were identified in this SDG.

IV. Surrogate Spikes

Surrogate spikes were not required by the method.

V. Matrix Spike

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VI. Laboratory Duplicate Sample

The laboratory has indicated that there were no laboratory duplicate (DUP) analyses specified for the samples in this SDG, and therefore laboratory duplicate analyses were not performed for this SDG.

VII. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Field Duplicate Samples

No field duplicates were identified in this SDG.

X. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
08-May-2020	EFFLUENT	JD7050-1	N	3010A	6020B	S2AVE
08-May-2020	EFFLUENTMS	MP21063-S1	MS	3010A	6020B	S2AVE
08-May-2020	EFFLUENTMSD	MP21063-S2	MSD	3010A	6020B	S2AVE

N = Normal Sample MS = Matrix Spike MSD = Matrix Spike Duplicate
S2AVE = Stage 2A Validation

Attachment 2

Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: JD7050

Laboratory: ACTD

EDD Filename: JD7050-SEDD_2a_1

eQAPP Name: Sovereign_Shepley'sHillLandfill_180924

No Data Review Qualifiers Applied.

Enclosure I

Stage 2A ADR Outliers

Quality Control Outlier Reports

JD7050

(No Outliers)

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Sovereign Consulting Inc.
16 Chestnut Street, Suite 520
Foxborough, MA 02035
ATTN: Mr. Steven Passafaro
spassafaro@sovcon.com

July 13, 2020

SUBJECT: Shepley's Hill, Data Validation

Dear Mr. Passafaro,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on June 19, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #48392:

SDG #	**Fraction**
JD8253	Metals, Wet Chemistry

The data validation was performed under Stage 2A guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts; March 2015
- USEPA National Functional Guidelines for Inorganic Superfund Data Review; January 2017
- 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

155 pages-ADV (no worksheets) Attachment 1

ADR (Stage 2A)

LDC #48392 (Sovereign Consulting, Inc., Foxborough, MA / Shepley's Hill)

LDC	SDG#	DATE REC'D	(3) DATE DUE	(3) Metals (6010D)		Fe,Mn (6010D)		As (6020B)		Cl,SO_4 (300.0 /9056A)		NO_3N (353.2)		NO_3/ NO_2-N (353.2)		NO_2-N (4500-NO2B)																					
Matrix:	Water/Sediment			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	JD8253	06/19/20	07/13/20	1	0	2	0	3	0	1	0	1	0	1	0	1	0																				
Total	J/PG			1	0	2	0	3	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10

Shaded cells indicate Stage 4 validation (all other cells are ADR review). These sample counts do not include MS, MSD, or DUP's.

L:\Sovereign\Shepleys Hill\48392ST.wpd

Data Validation Report
Shepley's Hill

SDG: JD8253

Prepared for

Sovereign Consulting
16 Chestnut Street, Suite 520
Foxborough, MA 02035

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, California 92010

July 13, 2020

INTRODUCTION

This Data Validation Report (DVR) presents Stage 2A data validation results for samples collected during the June 2020 sampling period. Data validation was performed in accordance with the Quality Assurance Project Plan (QAPP) for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts (March 2015), and the US Environmental Protection Agency (EPA) National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Metals by EPA SW 846 Method 6010D and 6020B
Nitrate as Nitrogen and Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Nitrite as Nitrogen by Standard Method 4500 NO2-B
Chloride and Sulfate by EPA Method 300.0/SW 846 Method 9056A
Nitrite

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. Stage 2A Automated Data Review outliers are presented in Enclosure I.

All sample results were subjected to Stage 2A data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, matrix spike/matrix spike duplicates (MS/MSD), serial dilutions, laboratory control samples (LCS), and laboratory blanks.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013). Quality assurance (QA)/QC criteria specified in the QAPP and NFG were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

I. Sample Receipt and Technical Holding Time

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Laboratory Blanks

Laboratory blanks were performed as required by the methods. No contaminant concentrations were detected in the laboratory blanks reviewed by the ADR software program.

III. Field Blank Samples

No field blanks were identified in this SDG.

IV. Matrix Spike/Matrix Spike Duplicate

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Duplicate Sample Analysis

The laboratory has indicated that there were no laboratory duplicate (DUP) analyses specified for the samples in this SDG, and therefore laboratory duplicate analyses were not performed for this SDG.

VI. Serial Dilution

Serial dilution analysis was performed on an associated project sample. The analysis criteria were met.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Field Duplicate Samples

No field duplicates were identified in this SDG.

IX. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

All compounds reported below the limit of quantitation (LOQ) as detected by the laboratory were qualified as detected estimated (J). The details regarding the qualification of data are provided in Enclosure I.

X. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported as detected below the LOQ, data was qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

Data flags are summarized and are presented as Attachment 2.

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
05-Jun-2020	EW-01	JD8253-2	N	3010A	6010D	S2AVE
05-Jun-2020	EW-01	JD8253-2	N	3010A	6020B	S2AVE
05-Jun-2020	EW-04	JD8253-3	N	3010A	6010D	S2AVE
05-Jun-2020	EW-04	JD8253-3	N	3010A	6020B	S2AVE
05-Jun-2020	EFFLUENT	JD8253-1	N	3010A	6010D	S2AVE
05-Jun-2020	EFFLUENT	JD8253-1	N	3010A	6020B	S2AVE
05-Jun-2020	EFFLUENT	JD8253-1	N	Gen Prep	300.0	S2AVE
05-Jun-2020	EFFLUENT	JD8253-1	N	Gen Prep	353.2	S2AVE
05-Jun-2020	EFFLUENT	JD8253-1	N	Gen Prep	353.2_CALC	S2AVE
05-Jun-2020	EFFLUENTMS	MP21388-S1	MS	3010A	6020B	S2AVE
05-Jun-2020	EFFLUENTMSD	MP21388-S2	MSD	3010A	6020B	S2AVE
05-Jun-2020	EFFLUENTMS	MP21415-S1	MS	3010A	6010D	S2AVE
05-Jun-2020	EFFLUENTMSD	MP21415-S2	MSD	3010A	6010D	S2AVE

N = Normal Sample MS = Matrix Spike MSD = Matrix Spike Duplicate
S2AVE = EPA Level II Validation

Attachment 2

Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: JD8253 **Laboratory: ACTD**

EDD Filename: JD8253-SEDD_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Method Category: **METALS**

Method: 6010D ***Matrix:*** Water

Sample ID: EFFLUENT ***Collected:*** 6/5/2020 8:47:00 AM ***Analysis Type:*** Initial/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BARIUM	14.5	J	100	LOD	200	LOQ	ug/L	J	TR

* denotes a non-reportable result

Project Name and Number: - USACE Project: Shepley's Hill (SHL), Devens, MA

Data Qualifier Summary

Lab Reporting Batch ID: JD8253 **Laboratory: ACTD**

EDD Filename: JD8253-SEDD_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Reason Code Legend

Reason Code	*Description*
TR	Reporting Limit Trace Value

* denotes a non-reportable result

Project Name and Number: - USACE Project: Shepley's Hill (SHL), Devens, MA

Enclosure I

Stage 2A ADR Outliers

Quality Control Outlier Reports

JD8253

Reporting Limit Outliers

Lab Reporting Batch ID: JD8253 **Laboratory: ACTD**

EDD Filename: JD8253-SEDD_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Method: **6010D**

Matrix: **Water**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
EFFLUENT	BARIUM	J	14.5	200	LOQ	ug/L	J (all detects)

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Sovereign Consulting Inc.
16 Chestnut Street, Suite 520
Foxborough, MA 02035
ATTN: Mr. Steven Passafaro
spassafaro@sovcon.com

August 5, 2020

SUBJECT: Shepley's Hill, Data Validation

Dear Mr. Passafaro,

Enclosed is the final validation report for the fraction listed below. This SDG was received on July 17, 2020. Attachment 1 is a summary of the samples that were reviewed for analysis.

LDC Project #48649:

SDG #	**Fraction**
JD9969	Metals

The data validation was performed under Stage 2A guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts; March 2015
- USEPA National Functional Guidelines for Inorganic Superfund Data Review; January 2017
- 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

53 pages-ADV (no worksheets) Attachment 1

ADR (Stage 2A) **LDC #48649 (Sovereign Consulting, Inc., Foxborough, MA / Shepley's Hill)**

LDC	SDG#	DATE REC'D	(3) DATE DUE	As (6020B)																																			
Matrix:	Water/Sediment			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	JD9969	07/17/20	08/07/20	1	0																																		
Total	T/PG			1	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	0	0	0	0	0	0	1

Shaded cells indicate Stage 4 validation (all other cells are ADR review). These sample counts do not include MS, MSD, or DUP's.

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Data Validation Report
Shepley's Hill

SDG: JD9969

Prepared for

Sovereign Consulting
16 Chestnut Street, Suite 520
Foxborough, MA 02035

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, California 92010

August 5, 2020

INTRODUCTION

This Data Validation Report (DVR) presents Stage 2A data validation results for samples collected during the July 2020 sampling period. Data validation was performed in accordance with the Quality Assurance Project Plan (QAPP) for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts (March 2015), and the US Environmental Protection Agency (EPA) National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic by EPA SW 846 Method 6020B

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. Stage 2A Automated Data Review outliers are presented in Enclosure I.

All sample results were subjected to Stage 2A data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, laboratory control samples (LCS), and laboratory blanks.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013). Quality assurance (QA)/QC criteria specified in the QAPP and NFG were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

I. Sample Receipt and Technical Holding Time

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Laboratory Blanks

Laboratory blanks were performed as required by the methods. No contaminant concentrations were detected in the laboratory blanks reviewed by the ADR software program.

III. Field Blank Samples

No field blanks were identified in this SDG.

IV. Matrix Spike

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed.

V. Laboratory Duplicate Sample

The laboratory has indicated that there were no laboratory duplicate (DUP) analyses specified for the samples in this SDG, and therefore laboratory duplicate analyses were not performed for this SDG.

VI. Serial Dilution

Serial dilution was not performed for this SDG.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Field Duplicate Samples

No field duplicates were identified in this SDG.

IX. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

X. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG. The quality control criteria reviewed were met and are considered acceptable.

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
10-Jul-2020	EFFLUENT	JD9969-1	N	3010A	6020B	S2AVE

N = Normal Sample
S2AVE = EPA Level II Validation

Attachment 2

Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: JD9969

Laboratory: ACTD

EDD Filename: JD9969-SEDD_2a_1

eQAPP Name: Sovereign_Shepley'sHillLandfill_180924

No Data Review Qualifiers Applied.

Enclosure I

Stage 2A ADR Outliers

Quality Control Outlier Reports

JD9969

(No Outliers)

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Sovereign Consulting Inc.
16 Chestnut Street, Suite 520
Foxborough, MA 02035
ATTN: Mr. Steven Passafaro
spassafaro@sovcon.com

September 3, 2020

SUBJECT: Shepley's Hill, Data Validation

Dear Mr. Passafaro,

Enclosed is the final validation report for the fraction listed below. This SDG was received on August 13, 2020. Attachment 1 is a summary of the samples that were reviewed for analysis.

LDC Project #48857:

SDG #	**Fraction**
JD11438	Arsenic

The data validation was performed under Stage 2A guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts; March 2015
- USEPA National Functional Guidelines for Inorganic Superfund Data Review; January 2017
- 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

46 pages-ADV (no worksheets) Attachment 1

ADR (Stage 2A) **LDC #48857 (Sovereign Consulting, Inc., Foxborough, MA / Shepley's Hill)**

LDC	SDG#	DATE REC'D	(3) DATE DUE	As (6020B)																																			
Matrix:	Water/Sediment			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	JD11438	08/13/20	09/03/20	1	0																																		
Total	T/PG			1	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	0	0	0	0	0	0	1

Shaded cells indicate Stage 4 validation (all other cells are ADR review). These sample counts do not include MS, MSD, or DUP's.

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Data Validation Report
Shepley's Hill

SDG: JD11438

Prepared for

Sovereign Consulting
16 Chestnut Street, Suite 520
Foxborough, MA 02035

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, California 92010

September 2, 2020

INTRODUCTION

This Data Validation Report (DVR) presents Stage 2A data validation results for samples collected during the August 2020 sampling period. Data validation was performed in accordance with the Quality Assurance Project Plan (QAPP) for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts (March 2015), and the US Environmental Protection Agency (EPA) National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic by EPA SW 846 Method 6020B

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. Stage 2A Automated Data Review outliers are presented in Enclosure I.

All sample results were subjected to Stage 2A data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, laboratory control samples (LCS), and laboratory blanks.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013). Quality assurance (QA)/QC criteria specified in the QAPP and NFG were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

I. Sample Receipt and Technical Holding Time

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Laboratory Blanks

Laboratory blanks were performed as required by the methods. No contaminant concentrations were detected in the laboratory blanks reviewed by the ADR software program.

III. Field Blank Samples

No field blanks were identified in this SDG.

IV. Surrogate Spikes

Surrogate spikes were not required by the method.

V. Matrix Spike

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed.

VI. Laboratory Duplicate Sample

The laboratory has indicated that there were no laboratory duplicate (DUP) analyses specified for the samples in this SDG, and therefore laboratory duplicate analyses were not performed for this SDG.

VII. Serial Dilution

Serial dilution was not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Field Duplicate Samples

No field duplicates were identified in this SDG.

X. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
07-Aug-2020	EFFLUENT	JD11438-1	N	3010A	6020B	S2AVE

N = Normal Sample
S2AVE = EPA Level II Validation

Attachment 2

Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: JD11438

Laboratory: ACTD

EDD Filename: JD11438-SEDD_2a_1

eQAPP Name: Sovereign_Shepley'sHillLandfill_180924

No Data Review Qualifiers Applied.

Enclosure I

Stage 2A ADR Outliers

Quality Control Outlier Reports

JD11438

(No Outliers)

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Sovereign Consulting Inc.
16 Chestnut Street, Suite 520
Foxborough, MA 02035
ATTN: Mr. Steven Passafaro
spassafaro@sovcon.com

November 3, 2020

SUBJECT: Shepley's Hill, Data Validation

Dear Mr. Passafaro,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on October 13, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #49391:

SDG #	Fraction
JD12771	Volatiles, Semivolatiles, Chlorinated Pesticides, Metals, Wet Chemistry

The data validation was performed under Stage 2A guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts; March 2015
- USEPA National Functional Guidelines for Organic Superfund Methods Data Review; January 2017
- USEPA National Functional Guidelines for Inorganic Superfund Data Review; January 2017
- 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

377 pages-ADV (no worksheets) Attachment 1

ADR (Stage 2A)

LDC #49391 (Sovereign Consulting, Inc., Foxborough, MA / Shepley's Hill)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260C)		VOA (624.1)		SVOA (625.1)		Pest. PCBs (608.3)		Metals (6010D /7470A)		Fe,Mn (6010D)		As (6020B)		Methane Ethane (175)		Cl,SO_4 (300.0 /9056A)		NO_3N (353.2)		NO_3/ NO_2-N (353.2)		NO_2-N (4500-NO2B)		HEM (1664A)									
Matrix:	Water/Sediment			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	JD12771	10/13/20	11/03/20	2	0	1	0	1	0	1	0	1	0	2	0	3	0	2	0	1	0	1	0	1	0	1	0	1	0								
Total	T/PG			2	0	1	0	1	0	1	0	1	0	2	0	3	0	2	0	1	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	18

Shaded cells indicate Stage 4 validation (all other cells are ADR review). These sample counts do not include MS, MSD, or DUP's.

L:\Sovereign\Shepleys Hill\49391ST.wpd

Data Validation Report
Shepley's Hill

SDG: JD12771

Prepared for

Sovereign Consulting
16 Chestnut Street, Suite 520
Foxborough, MA 02035

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, CA 92010

November 2, 2020

INTRODUCTION

This Data Validation Report (DVR) presents Stage 2A data validation results for samples collected during the September 2020 sampling period. Data validation was performed in accordance with the Quality Assurance Project Plan (QAPP) for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts (March 2015), the US Environmental Protection Agency (EPA) National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017), and the US EPA NFG for Organic Superfund Methods Data Review (January 2017). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW 846 Method 8260C and EPA Method 624.1
Semivolatile Organic Compounds (SVOCs) by EPA Method 625.1
Chlorinated Pesticides and Polychlorinated Biphenyls (PCBs) by EPA Method 608.3
Metals by EPA SW 846 Method 6010D/6020B
Mercury by EPA SW 846 Method 7470A
N-Hexane Extractable Material (HEM) by EPA Method 1664A

Wet Chemistry:
Chloride and Sulfate by EPA Method 300.0/SW 846 Method 9056A
Nitrate as Nitrogen (N) and Nitrate-Nitrite as N by EPA Method 353.2
Nitrite as N by Standard Method 4500NO2 B-11

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. Stage 2A Automated Data Review outliers are presented in Enclosure I.

All sample results were subjected to Stage 2A data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, surrogates, matrix spike/matrix spike duplicates (MS/MSD), serial dilutions, laboratory control sample/laboratory control sample duplicates (LCS/LCSD), and laboratory blanks.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013) with the exception of serial dilutions, which were validated manually. Quality assurance (QA)/QC criteria specified in the QAPP and NFGs were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detect): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not applicable): Data did not warrant qualification since detected results only are affected and the compound was not detected in the associated samples.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt & Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Laboratory Blanks

Laboratory blanks were performed as required by the methods. No contaminant concentrations were detected in the laboratory blanks reviewed by the ADR software program with the exception of one blank for selenium. The associated sample results were qualified as non-detected (U) due to laboratory blank contamination as applicable. The sample results that were not detected or were significantly greater than the concentrations found in the associated blanks were not qualified. The details regarding the qualification of data are provided in Enclosure I.

III. Field Blank Samples

No field blanks were identified in this SDG.

IV. Surrogate Spikes

Surrogates were added to all samples as required by the methods. All surrogate recoveries (%R) were within QC limits.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicate Sample Analysis

The laboratory has indicated that there were no laboratory duplicate (DUP) analyses specified for the samples in this SDG, and therefore laboratory duplicate analyses were not performed for this SDG.

VII. Serial Dilution

Serial dilution analysis was performed on an associated project sample. The analysis criteria were met.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control sample duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the exception of one LCS for tetrachloroethene and one LCS for methane. The associated sample results were qualified as detected estimated (J) or non-detected estimated (UJ) as applicable. No data were qualified due to high %Rs when the associated results were non-detected. The details regarding the qualification of data are provided in Enclosure I.

IX. Field Duplicate Samples

No field duplicates were identified in this SDG.

X. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

All compounds reported below the limit of quantitation (LOQ) as detected by the laboratory were qualified as detected estimated (J). The details regarding the qualification of data are provided in Enclosure I.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to LCS/LCSD %R, data were qualified as estimated in two samples.

Due to results below the LOQ, data were qualified as estimated in two samples.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

Data flags are summarized and are presented as Attachment 2.

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
04-Sep-2020	EW-04	JD12771-3	N		RSK 175	S2AVE
04-Sep-2020	EW-04	JD12771-3	N	3010A	6010D	S2AVE
04-Sep-2020	EW-04	JD12771-3	N	3010A	6020B	S2AVE
04-Sep-2020	EW-04	JD12771-3	N	5030B	8260C	S2AVE
04-Sep-2020	EW-01	JD12771-2	N		RSK 175	S2AVE
04-Sep-2020	EW-01	JD12771-2	N	3010A	6010D	S2AVE
04-Sep-2020	EW-01	JD12771-2	N	3010A	6020B	S2AVE
04-Sep-2020	EW-01	JD12771-2	N	5030B	8260C	S2AVE
04-Sep-2020	EFFLUENT	JD12771-1	N		624	S2AVE
04-Sep-2020	EFFLUENT	JD12771-1	N	3010A	6010D	S2AVE
04-Sep-2020	EFFLUENT	JD12771-1	N	3010A	6020B	S2AVE
04-Sep-2020	EFFLUENT	JD12771-1	N	7470A	7470A	S2AVE
04-Sep-2020	EFFLUENT	JD12771-1	N	EPA 608	608-PCB	S2AVE
04-Sep-2020	EFFLUENT	JD12771-1	N	EPA 608	608-PEST	S2AVE
04-Sep-2020	EFFLUENT	JD12771-1	N	EPA 625	625	S2AVE
04-Sep-2020	EFFLUENT	JD12771-1	N	Gen Prep	1664	S2AVE
04-Sep-2020	EFFLUENT	JD12771-1	N	Gen Prep	300.0	S2AVE
04-Sep-2020	EFFLUENT	JD12771-1	N	Gen Prep	353.2	S2AVE
04-Sep-2020	EFFLUENT	JD12771-1	N	Gen Prep	353.2_CALC	S2AVE
04-Sep-2020	EFFLUENTMS	MP22721A-S3	MS	3010A	6020B	S2AVE
04-Sep-2020	EFFLUENTMSD	MP22721A-S4	MSD	3010A	6020B	S2AVE
04-Sep-2020	EFFLUENTMS	MP22721-S1	MS	3010A	6010D	S2AVE
04-Sep-2020	EFFLUENTMSD	MP22721-S2	MSD	3010A	6010D	S2AVE
04-Sep-2020	EFFLUENTMS	MP22761-S1	MS	7470A	7470A	S2AVE
04-Sep-2020	EFFLUENTMSD	MP22761-S2	MSD	7470A	7470A	S2AVE

N = Normal Sample MS = Matrix Spike MSD = Matrix Spike Duplicate
S2AVE = EPA Level II Validation

Attachment 2

Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: JD12771 **Laboratory: ACTD**

EDD Filename: jd12771-sedd_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Method Category: METALS
Method: 6010D ***Matrix:*** Water

Sample ID: EFFLUENT ***Collected:*** 9/4/2020 10:50:00 AM ***Analysis Type:*** Initial/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SELENIUM	6.1	J	8.0	LOD	10	LOQ	ug/L	U	B
BARIUM	15.4	J	100	LOD	200	LOQ	ug/L	J	TR

Method Category: VOA
Method: 624 ***Matrix:*** Water

Sample ID: EFFLUENT ***Collected:*** 9/4/2020 10:50:00 AM ***Analysis Type:*** Initial/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	3.4	J	3.0	LOD	5.0	LOQ	ug/L	J	TR
BENZENE	0.67	J	0.50	LOD	1.0	LOQ	ug/L	J	TR
CHLOROBENZENE	0.52	J	0.50	LOD	1.0	LOQ	ug/L	J	TR
P/M-XYLENE	0.95	J	0.90	LOD	1.0	LOQ	ug/L	J	TR
XYLENES (TOTAL)	0.95	J	0.50	LOD	1.0	LOQ	ug/L	J	TR

Method Category: VOA
Method: 8260C ***Matrix:*** Water

Sample ID: EW-01 ***Collected:*** 9/4/2020 10:00:00 AM ***Analysis Type:*** Initial/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CHLOROBENZENE	0.71	J	0.75	LOD	1.0	LOQ	ug/L	J	TR
CIS-1,2-DICHLOROETHENE	0.66	J	0.75	LOD	1.0	LOQ	ug/L	J	TR

Method Category: VOA
Method: RSK 175 ***Matrix:*** Water

Sample ID: EW-01 ***Collected:*** 9/4/2020 10:00:00 AM ***Analysis Type:*** Dilution-1/TOT ***Dilution:*** 25

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
METHANE	1370		2.3	LOD	2.8	LOQ	ug/L	J	L

* denotes a non-reportable result

Project Name and Number: - USACE Project: Shepley's Hill (SHL), Devens, MA

Data Qualifier Summary

Lab Reporting Batch ID: JD12771 **Laboratory: ACTD**

EDD Filename: jd12771-sedd_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Method Category: **VOA**

Method: **RSK 175** ***Matrix:*** **Water**

Sample ID: **EW-04** ***Collected:*** **9/4/2020 9:45:00 AM** ***Analysis Type:*** **Dilution-1/TOT** ***Dilution:*** **10**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
METHANE	671		0.90	LOD	1.1	LOQ	ug/L	J	L

* denotes a non-reportable result

Project Name and Number: - USACE Project: Shepley's Hill (SHL), Devens, MA

Data Qualifier Summary

Lab Reporting Batch ID: JD12771 **Laboratory: ACTD**

EDD Filename: jd12771-sedd_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Reason Code Legend

Reason Code	*Description*
B	Method Blank Contamination
L	Laboratory Control Spike Lower Estimation
L	Laboratory Control Spike Upper Estimation
TR	Reporting Limit Trace Value

* denotes a non-reportable result

Project Name and Number: - USACE Project: Shepley's Hill (SHL), Devens, MA

Enclosure I

Stage 2A ADR Outliers

Quality Control Outlier Reports

JD12771

Method Blank Outlier Report

Lab Reporting Batch ID: JD12771 **Laboratory: ACTD**

EDD Filename: jd12771-sedd_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Method: **6010D**
Matrix: **Water**

Method Blank Sample ID	Analysis Date	Analyte	Result	Associated Samples
MP22721-MB1	9/11/2020 11:17:00 AM	SELENIUM	5.2 ug/L	EFFLUENT EW-01 EW-04

The following samples and their listed target analytes were qualified due to contamination reported in this blank

Sample ID	Analyte	Reported Result	Modified Final Result
EFFLUENT(Initial/TOT)	SELENIUM	6.1 ug/L	6.1U ug/L

Lab Control Spike/Lab Control Spike Duplicate Outlier Report

Lab Reporting Batch ID: JD12771 **Laboratory: ACTD**

EDD Filename: jd12771-sedd_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Method: RSK 175
Matrix: Water

QC Sample ID (Associated Samples)	Compound	LCS %R	LCSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
GAA2113-LCS (EW-01 EW-04)	METHANE	78	-	80.00-120.00	-	METHANE	J (all detects) UJ (all non-detects)

Method: 8260C
Matrix: Water

QC Sample ID (Associated Samples)	Compound	LCS %R	LCSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
V4D4630-BS (EW-01 EW-04)	TETRACHLOROETHENE	140	-	74.00-129.00	-	TETRACHLOROETHENE	J(all detects)

Reporting Limit Outliers

Lab Reporting Batch ID: JD12771 **Laboratory: ACTD**

EDD Filename: jd12771-sedd_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Method: **6010D**

Matrix: **Water**

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
EFFLUENT	BARIUM	J	15.4	200	LOQ	ug/L	J (all detects)
	SELENIUM	J	6.1	10	LOQ	ug/L	

Method: **624**

Matrix: **Water**

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
EFFLUENT	ACETONE	J	3.4	5.0	LOQ	ug/L	J (all detects)
	BENZENE	J	0.67	1.0	LOQ	ug/L	
	CHLOROBENZENE	J	0.52	1.0	LOQ	ug/L	
	P/M-XYLENE	J	0.95	1.0	LOQ	ug/L	
	XYLENES (TOTAL)	J	0.95	1.0	LOQ	ug/L	

Method: **8260C**

Matrix: **Water**

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
EW-01	CHLOROBENZENE	J	0.71	1.0	LOQ	ug/L	J (all detects)
	CIS-1,2-DICHLOROETHENE	J	0.66	1.0	LOQ	ug/L	

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Sovereign Consulting Inc.
16 Chestnut Street, Suite 520
Foxborough, MA 02035
ATTN: Mr. Steven Passafaro
spassafaro@sovcon.com

November 11, 2020

SUBJECT: Shepley's Hill, Data Validation

Dear Mr. Passafaro,

Enclosed is the final validation report for the fraction listed below. This SDG was received on October 22, 2020. Attachment 1 is a summary of the samples that were reviewed for analysis.

LDC Project #49481:

SDG #	**Fraction**
JD14544	Arsenic

The data validation was performed under Stage 2A guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts; March 2015
- USEPA National Functional Guidelines for Inorganic Superfund Data Review; January 2017
- 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

50 pages-ADV (no worksheets) Attachment 1

ADR (Stage 2A) **LDC #49481 (Sovereign Consulting, Inc., Foxborough, MA / Shepley's Hill)**

LDC	SDG#	DATE REC'D	(3) DATE DUE	As (6020B)																																			
Matrix:	Water/Sediment			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	JD14544	10/22/20	11/12/20	1	0																																		
Total	T/PG			1	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	0	0	0	0	0	0	1

Shaded cells indicate Stage 4 validation (all other cells are ADR review). These sample counts do not include MS, MSD, or DUP's.

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Data Validation Report
Shepley's Hill

SDG: JD14544

Prepared for

Sovereign Consulting
16 Chestnut Street, Suite 520
Foxborough, MA 02035

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, California 92010

November 11, 2020

INTRODUCTION

This Data Validation Report (DVR) presents Stage 2A data validation results for samples collected during the October 2020 sampling period. Data validation was performed in accordance with the Quality Assurance Project Plan (QAPP) for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts (March 2015), and the US Environmental Protection Agency (EPA) National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic by EPA SW 846 Method 6020B

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. Stage 2A Automated Data Review outliers are presented in Enclosure I.

All sample results were subjected to Stage 2A data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, laboratory control samples (LCS), and laboratory blanks.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013). Quality assurance (QA)/QC criteria specified in the QAPP and NFG were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

I. Sample Receipt and Technical Holding Time

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Laboratory Blanks

Laboratory blanks were performed as required by the methods. No contaminant concentrations were detected in the laboratory blanks reviewed by the ADR software program.

III. Field Blank Samples

No field blanks were identified in this SDG.

IV. Surrogate Spikes

Surrogate spikes were not required by the method.

V. Matrix Spike

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed.

VI. Laboratory Duplicate Sample

The laboratory has indicated that there were no laboratory duplicate (DUP) analyses specified for the samples in this SDG, and therefore laboratory duplicate analyses were not performed for this SDG.

VII. Serial Dilution

Serial dilution was not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Field Duplicate Samples

No field duplicates were identified in this SDG.

X. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
09-Oct-2020	EFFLUENT	JD14544-1	N	3010A	6020B	S2AVE

N = Normal Sample
S2AVE = EPA Level II Validation

Attachment 2

Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: JD14544

Laboratory: ACTD

EDD Filename: jd14544-sedd_2a_1

eQAPP Name: Sovereign_Shepley'sHillLandfill_180924

No Data Review Qualifiers Applied.

Enclosure I

Stage 2A ADR Outliers

Quality Control Outlier Reports

JD14544

(No Outliers)

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Sovereign Consulting Inc.
16 Chestnut Street, Suite 520
Foxborough, MA 02035
ATTN: Mr. Steven Passafaro
spassafaro@sovcon.com

December 7, 2020

SUBJECT: Shepley's Hill, Data Validation

Dear Mr. Passafaro,

Enclosed is the final validation report for the fraction listed below. This SDG was received on November 16, 2020. Attachment 1 is a summary of the samples that were reviewed for analysis.

LDC Project #49685:

SDG #	**Fraction**
JD15728	Arsenic

The data validation was performed under Stage 2A guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts; March 2015
- USEPA National Functional Guidelines for Inorganic Superfund Data Review; January 2017
- 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

76 pages-ADV (no worksheets) Attachment 1

ADR (Stage 2A)	LDC #49685 (Sovereign Consulting, Inc., Foxborough, MA / Shepley's Hill)																																						
LDC	SDG#	DATE REC'D	(3) DATE DUE	As (6020B)																																			
Matrix:	Water/Sediment			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	JD15728	11/16/20	12/09/20	1	0																																		
Total	T/PG			1	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	0	0	0	0	0	0	1

Shaded cells indicate Stage 4 validation (all other cells are ADR review). These sample counts do not include MS, MSD, or DUP's.

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Data Validation Report
Shepley's Hill

SDG: JD15728

Prepared for

Sovereign Consulting
16 Chestnut Street, Suite 520
Foxborough, MA 02035

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, California 92010

December 7, 2020

INTRODUCTION

This Data Validation Report (DVR) presents Stage 2A data validation results for samples collected during the November 2020 sampling period. Data validation was performed in accordance with the Quality Assurance Project Plan (QAPP) for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts (March 2015), and the US Environmental Protection Agency (EPA) National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic by EPA SW 846 Method 6020B

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. Stage 2A Automated Data Review outliers are presented in Enclosure I.

All sample results were subjected to Stage 2A data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, matrix spike/matrix spike duplicates, serial dilutions, laboratory control samples (LCS), and laboratory blanks.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013). Quality assurance (QA)/QC criteria specified in the QAPP and NFG were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

I. Sample Receipt and Technical Holding Time

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Laboratory Blanks

Laboratory blanks were performed as required by the methods. No contaminant concentrations were detected in the laboratory blanks reviewed by the ADR software program.

III. Field Blank Samples

No field blanks were identified in this SDG.

IV. Surrogate Spikes

Surrogate spikes were not required by the method.

V. Matrix Spike

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Laboratory Duplicate Sample

The laboratory has indicated that there were no laboratory duplicate (DUP) analyses specified for the samples in this SDG, and therefore laboratory duplicate analyses were not performed for this SDG.

VII. Serial Dilution

Serial dilution analysis was performed on an associated project sample. The analysis criteria were met.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Field Duplicate Samples

No field duplicates were identified in this SDG.

X. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
04-Nov-2020	EFFLUENT	JD15728-1	N	3010A	6020B	S2AVE
04-Nov-2020	EFFLUENTMS	MP23696-S1	MS	3010A	6020B	S2AVE
04-Nov-2020	EFFLUENTMSD	MP23696-S2	MSD	3010A	6020B	S2AVE

N = Normal Sample MS = Matrix Spike MSD = Matrix Spike Duplicate
S2AVE = EPA Level II Validation

Attachment 2
Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: JD15728

Laboratory: ACTD

EDD Filename: jd15728-sedd_2a_1

eQAPP Name: Sovereign_Shepley'sHillLandfill_180924

No Data Review Qualifiers Applied.

Enclosure I

Stage 2A ADR Outliers

Quality Control Outlier Reports

JD15728

(No Outliers)

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Sovereign Consulting Inc.
16 Chestnut Street, Suite 520
Foxborough, MA 02035
ATTN: Mr. Steven Passafaro
spassafaro@sovcon.com

January 12, 2021

SUBJECT: Shepley's Hill, Data Validation

Dear Mr. Passafaro,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on December 18, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #50044:

SDG #	**Fraction**
JD17277	Metals,

The data validation was performed under Stage 2A guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts; March 2015
- USEPA National Functional Guidelines for Inorganic Superfund Data Review; January 2017
- 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

133 pages-ADV (no worksheets) Attachment 1

ADR (Stage 2A)

LDC #50044 (Sovereign Consulting, Inc., Foxborough, MA / Shepley's Hill)

LDC	SDG#	DATE REC'D	(3) DATE DUE	(3) Metals (6010D)		Fe,Mn (6010D)		As (6020B)		Cl,SO_4 (300.0 /9056A)		NO_3N (353.2)		NO_2-N (4500-NO2B)		NO_3/ NO_2-N (353.2)																					
Matrix:	Water/Sediment			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	JD17277	12/18/20	01/12/21	1	0	2	0	3	0	1	0	1	0	1	0	1	0																				
Total	T/PG			1	0	2	0	3	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10

Shaded cells indicate Stage 4 validation (all other cells are ADR review). These sample counts do not include MS, MSD, or DUP's.

L:\Sovereign\Shepleys Hill\50044ST.wpd

Data Validation Report
Shepley's Hill

SDG: JD17277

Prepared for

Sovereign Consulting
16 Chestnut Street, Suite 520
Foxborough, MA 02035

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, California 92010

January 11, 2021

INTRODUCTION

This Data Validation Report (DVR) presents Stage 2A data validation results for samples collected during the December 2020 sampling period. Data validation was performed in accordance with the Quality Assurance Project Plan (QAPP) for Shepley's Hill Landfill Treatment System O&M Services, Devens, Massachusetts (March 2015), and the US Environmental Protection Agency (EPA) National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Metals by EPA SW 846 Method 6010D and 6020B
Nitrate as Nitrogen and Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Nitrite as Nitrogen by Standard Method 4500 NO2-B
Chloride and Sulfate by EPA Method 300.0/SW 846 Method 9056A

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. Stage 2A Automated Data Review outliers are presented in Enclosure I.

All sample results were subjected to Stage 2A data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, matrix spike/matrix spike duplicates (MS/MSD), duplicate sample analysis (DUP), serial dilutions, laboratory control samples (LCS), and laboratory blanks.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013). Quality assurance (QA)/QC criteria specified in the QAPP and NFG were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

I. Sample Receipt and Technical Holding Time

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Laboratory Blanks

Laboratory blanks were performed as required by the methods. No contaminant concentrations were detected in the laboratory blanks reviewed by the ADR software program.

III. Field Blank Samples

No field blanks were identified in this SDG.

IV. Matrix Spike/Matrix Spike Duplicate

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the exception of one MS/MSD pair for arsenic. No data were qualified since sample concentrations were significantly greater (>4x) than the spike amount. The details are presented in Enclosure I.

V. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VI. Serial Dilution

Serial dilution analysis was performed on an associated project sample. The analysis criteria were met.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Field Duplicate Samples

No field duplicates were identified in this SDG.

IX. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

All compounds reported below the limit of quantitation (LOQ) as detected by the laboratory were qualified as detected estimated (J). The details regarding the qualification of data are provided in Enclosure I.

X. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported as detected below the LOQ, data was qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

Data flags are summarized and are presented as Attachment 2.

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
04-Dec-2020	EFFLUENTDUP	GP31260-D1	DUP	Gen Prep	300.0	S2AVE
04-Dec-2020	EFFLUENTMS	GP31260-S1	MS	Gen Prep	300.0	S2AVE
04-Dec-2020	EFFLUENTMS	GP31436-S2	MS	Gen Prep	353.2	S2AVE
04-Dec-2020	EFFLUENT	JD17277-1	N	3010A	6010D	S2AVE
04-Dec-2020	EFFLUENT	JD17277-1	N	3010A	6020B	S2AVE
04-Dec-2020	EFFLUENT	JD17277-1	N	Gen Prep	300.0	S2AVE
04-Dec-2020	EFFLUENT	JD17277-1	N	Gen Prep	353.2	S2AVE
04-Dec-2020	EFFLUENT	JD17277-1	N	Gen Prep	353.2_CALC	S2AVE
04-Dec-2020	EW-04	JD17277-3	N	3010A	6010D	S2AVE
04-Dec-2020	EW-04	JD17277-3	N	3010A	6020B	S2AVE
04-Dec-2020	EW-01	JD17277-2	N	3010A	6010D	S2AVE
04-Dec-2020	EW-01	JD17277-2	N	3010A	6020B	S2AVE
04-Dec-2020	EW-01MS	MP24191-S1	MS	3010A	6020B	S2AVE
04-Dec-2020	EW-01MSD	MP24191-S2	MSD	3010A	6020B	S2AVE
04-Dec-2020	EW-01MS	MP24238-S1	MS	3010A	6010D	S2AVE
04-Dec-2020	EW-01MSD	MP24238-S2	MSD	3010A	6010D	S2AVE

N = Normal Sample DUP = Laboratory Duplicate MS = Matrix Spike MSD = Matrix Spike Duplicate
S2AVE = EPA Level II Validation

Attachment 2

Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: JD17277 **Laboratory: ACTD**

EDD Filename: jd17277-sedd_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Method Category: **METALS**

Method: **6010D** ***Matrix:*** **Water**

Sample ID: **EFFLUENT** ***Collected:*** **12/4/2020 12:30:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	*Lab Result*	*Lab Qual*	*DL*	*DL Type*	*RL*	*RL Type*	*Units*	*Data Review Qual*	*Reason Code*
BARIUM	13.5	J	100	LOD	200	LOQ	ug/L	J	TR
MAGNESIUM	4660	J	500	LOD	5000	LOQ	ug/L	J	TR

* denotes a non-reportable result

Project Name and Number: - USACE Project: Shepley's Hill (SHL), Devens, MA

Data Qualifier Summary

Lab Reporting Batch ID: JD17277 **Laboratory: ACTD**

EDD Filename: jd17277-sedd_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Reason Code Legend

Reason Code	*Description*
Q	Matrix Spike Upper Estimation
TR	Reporting Limit Trace Value

* denotes a non-reportable result

Project Name and Number: - USACE Project: Shepley's Hill (SHL), Devens, MA

Enclosure I

Stage 2A ADR Outliers

Quality Control Outlier Reports

JD17277

Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: JD17277 **Laboratory: ACTD**

EDD Filename: jd17277-sedd_2a_1_rev **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Method: **6020B**

Matrix: **Water**

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
EW-01MS (Total) EW-01MSD (Total) (EFFLUENT EW-01 EW-04)	ARSENIC	175	150	80.00-120.00	-	ARSENIC	No Qual, >4x

Project Name and Number: - USACE Project: Shepley's Hill (SHL), Devens, MA

Reporting Limit Outliers

Lab Reporting Batch ID: JD17277 **Laboratory: ACTD**

EDD Filename: jd17277-sedd_2a_1 **eQAPP Name: Sovereign_Shepley'sHillLandfill_180924**

Method: **6010D**

Matrix: **Water**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
EFFLUENT	BARIUM	J	13.5	200	LOQ	ug/L	J (all detects)
	MAGNESIUM	J	4660	5000	LOQ	ug/L	

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, 680-190870-1 680-190885-1, 680-190931-1 680-191084-1, 680-190870-2 680-191084-2, 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, 680-190870-1 680-190885-1, 680-190931-1 680-191084-1, 680-190870-2 680-191084-2, 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, 680-190870-1 680-190885-1, 680-190931-1 680-191084-1, 680-190870-2 680-191084-2, 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, 680-190870-1 680-190885-1, 680-190931-1 680-191084-1, 680-190870-2 680-191084-2, 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

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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, 680-190870-1 680-190885-1, 680-190931-1 680-191084-1, 680-190870-2 680-191084-2, 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

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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, 680-190870-1 680-190885-1, 680-190931-1 680-191084-1, 680-190870-2 680-191084-2, 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

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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, 680-191218-1 680-191554-1	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, 680-191218-1 680-191554-1	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. 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, 680-191218-1 680-191554-1	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, 680-191377-1 680-191519-1	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, 680-191377-1 680-191519-1	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). 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.

LABORATORY DATA CONSULTANTS, INC.
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ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

March 16, 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 June 10, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #48291:

SDG #	Fraction
680-183899-1, 680-183912-1 680-183912-2/SN3820 680-183916-2/SN3818, 680-183925-1 680-183925-2/SN3819, 680-183926-1 680-183965-1, 680-184026-1 680-184098-1, 680-184215-1 680-184220-1, 680-183916-1	Volatiles, Chlorinated Pesticides, Metals, Wet Chemistry, Volatile Petroleum Hydrocarbons, Extractable Petroleum Hydrocarbons

The data validation was performed under Level II 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

518 pages-ADV R1 (added M) Attachment 1

Stage 2B EQUIS EDD

LDC #48291 (Arcadis-Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260B)		Pest. (8081B)		Metals (6010C /6020A /7470A)		(3) Metals (6010C/ 6020A)		(3)Diss Metals (6010C/ 6020A)		VPH (MADEP -VPH)		EPH (MADEP -EPH)		Alk. (2320B)		COD (410.4)		Cl,SO_4 (9056A)		CN- (9012B)		DOC (9060A)		NO_3 /NO_2-N (353.2)		TDS (2540C)							
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	680-183899-1	06/10/20	07/01/20	-	-	-	-	-	-	4	0	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
B	680-183912-1	06/10/20	07/01/20	-	-	4	0	4	0	-	-	-	-	-	-	-	-	4	0	4	0	4	0	4	0	-	-	4	0	4	0						
C	680-183912-2/SN3820	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	5	0	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
D	680-183916-2/SN3818	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	8	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
E	680-183925-1	06/10/20	07/01/20	-	-	1	0	1	0	-	-	-	-	-	-	-	-	1	0	1	0	1	0	1	0	-	-	1	0	1	0						
F	680-183925-2/SN3819	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
G	680-183926-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	7	0	-	-	-	-	7	0	-	-	7	0	-	-	7	0	-	-	-	-						
H	680-183965-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	10	0	-	-	-	-	10	0	-	-	10	0	-	-	10	0	-	-	-	-						
I	680-184026-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	17	0	-	-	-	-	17	0	-	-	17	0	-	-	17	0	-	-	-	-						
J	680-184098-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	12	0	-	-	-	-	12	0	-	-	12	0	-	-	12	0	-	-	-	-						
K	680-184215-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	15	0	-	-	-	-	15	0	-	-	15	0	-	-	15	0	-	-	-	-						
L	680-184220-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	8	0	-	-	-	-	8	0	-	-	8	0	-	-	8	0	-	-	-	-						
M	680-183916-1	06/17/20	07/09/20	6	0	-	-	-	-	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Total	T/PG			6	0	5	0	5	0	9	0	73	0	14	0	5	0	74	0	5	0	74	0	5	0	69	0	5	0	5	0	0	0	0	0	0	354

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 6801839261

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, SHL, Spring 2020
SDG:	6801839261
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:	June 30, 2020

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2320B	SW6010C - Dissolved	SW6020A - Dissolved	SW9056A	SW9060A - Dissolved
PZ-12-02-SPR20	680-183926-1	Water	Field Sample/N	X	X	X	X	X
PZ-12-07-SPR20	680-183926-2	Water	Field Sample/N	X	X	X	X	X
PZ-12-09-SPR20	680-183926-3	Water	Field Sample/N	X	X	X	X	X
PZ-12-09-SPR20 MS	680-183926-3	Water	Field Sample/N		X	X	X	X
PZ-12-09-SPR20 MSD	680-183926-3	Water	Field Sample/N		X	X	X	X
PZ-12-10-SPR20	680-183926-4	Water	Field Sample/N	X	X	X	X	X
PZ-12-10-SPR20 MS	680-183926-4	Water	Field Sample/N		X	X	X	X
PZ-12-10-SPR20 MSD	680-183926-4	Water	Field Sample/N		X	X	X	X
SHM-07-03-SPR20	680-183926-5	Water	Field Sample/N	X	X	X	X	X
SHP-2016-07B-SPR20	680-183926-6	Water	Field Sample/N	X	X	X	X	X
SHP-2016-1A-SPR20	680-183926-7	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) 6801839261. 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
- 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 (2.74%) out of the 73 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.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW9056A	No additional comments; see Checklist for detail.
SW9060A	No additional comments; see Checklist for detail.

June 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
CCB 680-619543/113 (CB)/ CCB 680-619543/113	Iron	20.30	< 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.

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
MB 680-619231/1-A (LB)/ MB 680-619231/1-A	Manganese	1.210	< 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
PZ-12-10-SPR20	N	Manganese	10.0	1.50 J	10.0 U		ug/l	L
SHP-2016-1A-SPR20	N	Manganese	10.0	2.30 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.

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-SPR20	N	Manganese	10.0	1.50 J	10.0 U		ug/l	L
SHP-2016-1A-SPR20	N	Manganese	10.0	2.30 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.

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
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?			•	
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 6801839261

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, two manganese results were qualified as non-detected (U) at the LOQ. Iron was detected in one calibration blank, however the associated sample results were either not detected or significantly greater than the concentration found in the calibration blank.
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.

Data Validation Report for 6801839261

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?			•	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 6801839261

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.

Data Validation Report for 6801839261

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

March 16, 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 June 10, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #48291:

SDG #	Fraction
680-183899-1, 680-183912-1 680-183912-2/SN3820 680-183916-2/SN3818, 680-183925-1 680-183925-2/SN3819, 680-183926-1 680-183965-1, 680-184026-1 680-184098-1, 680-184215-1 680-184220-1, 680-183916-1	Volatiles, Chlorinated Pesticides, Metals, Wet Chemistry, Volatile Petroleum Hydrocarbons, Extractable Petroleum Hydrocarbons

The data validation was performed under Level II 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

518 pages-ADV R1 (added M) Attachment 1

Stage 2B EQUIS EDD

LDC #48291 (Arcadis-Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260B)		Pest. (8081B)		Metals (6010C /6020A /7470A)		(3) Metals (6010C/ 6020A)		(3)Diss Metals (6010C/ 6020A)		VPH (MADEP -VPH)		EPH (MADEP -EPH)		Alk. (2320B)		COD (410.4)		Cl,SO_4 (9056A)		CN- (9012B)		DOC (9060A)		NO_3 /NO_2-N (353.2)		TDS (2540C)							
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	680-183899-1	06/10/20	07/01/20	-	-	-	-	-	-	4	0	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
B	680-183912-1	06/10/20	07/01/20	-	-	4	0	4	0	-	-	-	-	-	-	-	-	4	0	4	0	4	0	4	0	-	-	4	0	4	0						
C	680-183912-2/SN3820	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	5	0	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
D	680-183916-2/SN3818	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	8	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
E	680-183925-1	06/10/20	07/01/20	-	-	1	0	1	0	-	-	-	-	-	-	-	-	1	0	1	0	1	0	1	0	-	-	1	0	1	0						
F	680-183925-2/SN3819	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
G	680-183926-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	7	0	-	-	-	-	7	0	-	-	7	0	-	-	7	0	-	-	-	-						
H	680-183965-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	10	0	-	-	-	-	10	0	-	-	10	0	-	-	10	0	-	-	-	-						
I	680-184026-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	17	0	-	-	-	-	17	0	-	-	17	0	-	-	17	0	-	-	-	-						
J	680-184098-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	12	0	-	-	-	-	12	0	-	-	12	0	-	-	12	0	-	-	-	-						
K	680-184215-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	15	0	-	-	-	-	15	0	-	-	15	0	-	-	15	0	-	-	-	-						
L	680-184220-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	8	0	-	-	-	-	8	0	-	-	8	0	-	-	8	0	-	-	-	-						
M	680-183916-1	06/17/20	07/09/20	6	0	-	-	-	-	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Total	T/PG			6	0	5	0	5	0	9	0	73	0	14	0	5	0	74	0	5	0	74	0	5	0	69	0	5	0	5	0	0	0	0	0	0	354

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 6801839651

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, SHL, Spring 2020
SDG:	6801839651
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:	June 30, 2020

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2320B	SW6010C - Dissolved	SW6020A - Dissolved	SW9056A	SW9060A - Dissolved
EW-01-SPR20	680-183965-1	Water	Field Sample/N	X	X	X	X	X
EW-04-SPR20	680-183965-2	Water	Field Sample/N	X	X	X	X	X
PZ-12-01-SPR20	680-183965-3	Water	Field Sample/N	X	X	X	X	X
PZ-12-03-SPR20	680-183965-4	Water	Field Sample/N	X	X	X	X	X
PZ-12-04-SPR20	680-183965-5	Water	Field Sample/N	X	X	X	X	X
PZ-12-06-SPR20	680-183965-6	Water	Field Sample/N	X	X	X	X	X
SHL-11-SPR20	680-183965-7	Water	Field Sample/N	X	X	X	X	X
SHL-20-SPR20	680-183965-8	Water	Field Sample/N	X	X	X	X	X
SHL-DUP01-SPR20	680-183965-9	Water	Field Duplicate/FD	X	X	X	X	X
SHL-DUP02-SPR20	680-183965-10	Water	Field Duplicate/FD	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) 6801839651. 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 0 results (0.00%) out of the 70 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.

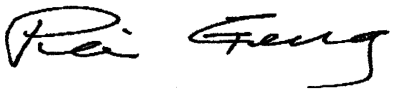
Narrative Comments

Analytical Method	Data Reviewer Comment
A2320B	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW9056A	No additional comments; see Checklist for detail.
SW9060A	No additional comments; see Checklist for detail.

June 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, 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-20-SPR20 (MS)/ 680-183965-8	Iron	26.00	87 - 115	10 - 125	percent	J/UJ	M	Spike amount Insignificant
SHL-20-SPR20 (MS)/ 680-183965-8	Manganese	35.00	90 - 114	10 - 125	percent	J/UJ	M	Spike amount Insignificant
SHL-20-SPR20 (SD)/ 680-183965-8	Iron	56.00	87 - 115	10 - 125	percent	J/UJ	M	Spike amount Insignificant
SHL-20-SPR20 (SD)/ 680-183965-8	Manganese	62.50	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
SHL-20-SPR20 (MS)/ 680-183965-8	Arsenic	62.00	84 - 116	10 - 125	percent	J/UJ	M	Spike amount Insignificant
SHL-20-SPR20 (SD)/ 680-183965-8	Arsenic	68.00	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 SW9056A, 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-12-01-SPR20 (MS)/ 680-183965-3	Chloride	88.00	90 - 110	10 - 110	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.

Qualified Results

No results associated with this sample delivery group required qualification.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
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?	•			The laboratory duplicate 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 6801839651

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?		•		Although iron and manganese were not within project acceptance limits, the parent results were greater than 4x the spike amount, therefore no qualification was necessary.
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 6801839651

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 was not within project acceptance limits, the parent results were greater than 4x the spike amount, therefore no qualification was necessary.
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 6801839651

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?	•			The chloride parent result was greater than 4x the spike amount and was 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 6801839651

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?	•			
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, Spring 2020
Field Duplicates for SDG: 6801839651

Location	Analysis
PZ-12-06	A2320B

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
PZ-12-06-SPR20 / SHL-DUP02-SPR20	680-183965-6 / 680-183965-10	Alkalinity, Total (as CaCO3)	74.0	73.0	10.0	1.36	30	OK	NA

Location	Analysis
PZ-12-06	SW6010C

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
PZ-12-06-SPR20 / SHL-DUP02-SPR20	680-183965-6 / 680-183965-10	Iron (FLDFLT)	4200	4500	50.0	6.90	30	OK	NA
PZ-12-06-SPR20 / SHL-DUP02-SPR20	680-183965-6 / 680-183965-10	Manganese (FLDFLT)	1200	1200	10.0	0.00	30	OK	NA

Location	Analysis
PZ-12-06	SW6020A

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
PZ-12-06-SPR20 / SHL-DUP02-SPR20	680-183965-6 / 680-183965-10	Arsenic (FLDFLT)	5.20	5.50	3.00	5.61	30	NA	OK

Location	Analysis
PZ-12-06	SW9056A

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
PZ-12-06-SPR20 / SHL-DUP02-SPR20	680-183965-6 / 680-183965-10	Chloride	3.30	3.30	0.500	0.00	30	OK	NA
PZ-12-06-SPR20 / SHL-DUP02-SPR20	680-183965-6 / 680-183965-10	Sulfate	62.0	62.0	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"

Field Duplicate Report By SDG
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, SHL, Spring 2020
Field Duplicates for SDG: 6801839651

Location	Analysis
PZ-12-06	SW9060A

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
PZ-12-06-SPR20 / SHL-DUP02-SPR20	680-183965-6 / 680-183965-10	Dissolved Organic Carbon (FLDFLT)	1.00	1.00	1.00	0.00	30	NA	OK

Location	Analysis
SHL-20	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-20-SPR20 / SHL-DUP01-SPR20	680-183965-8 / 680-183965-9	Alkalinity, Total (as CaCO3)	110	110	10.0	0.00	30	OK	NA

Location	Analysis
SHL-20	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-20-SPR20 / SHL-DUP01-SPR20	680-183965-8 / 680-183965-9	Iron (FLDFLT)	37000	36000	50.0	2.74	30	OK	NA
SHL-20-SPR20 / SHL-DUP01-SPR20	680-183965-8 / 680-183965-9	Manganese (FLDFLT)	2600	2500	10.0	3.92	30	OK	NA

Location	Analysis
SHL-20	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-20-SPR20 / SHL-DUP01-SPR20	680-183965-8 / 680-183965-9	Arsenic (FLDFLT)	810	810	3.00	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, Spring 2020
Field Duplicates for SDG: 6801839651

Location	Analysis
SHL-20	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-20-SPR20 / SHL-DUP01-SPR20	680-183965-8 / 680-183965-9	Chloride	60.0	60.0	0.500	0.00	30	OK	NA
SHL-20-SPR20 / SHL-DUP01-SPR20	680-183965-8 / 680-183965-9	Sulfate	36.0	37.0	1.00	2.74	30	OK	NA

Location	Analysis
SHL-20	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-20-SPR20 / SHL-DUP01-SPR20	680-183965-8 / 680-183965-9	Dissolved Organic Carbon (FLDFLT)	1.30	1.30	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

March 16, 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 June 10, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #48291:

SDG #	Fraction
680-183899-1, 680-183912-1 680-183912-2/SN3820 680-183916-2/SN3818, 680-183925-1 680-183925-2/SN3819, 680-183926-1 680-183965-1, 680-184026-1 680-184098-1, 680-184215-1 680-184220-1, 680-183916-1	Volatiles, Chlorinated Pesticides, Metals, Wet Chemistry, Volatile Petroleum Hydrocarbons, Extractable Petroleum Hydrocarbons

The data validation was performed under Level II 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

518 pages-ADV R1 (added M) Attachment 1

Stage 2B EQUIS EDD

LDC #48291 (Arcadis-Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260B)		Pest. (8081B)		Metals (6010C /6020A /7470A)		(3) Metals (6010C/ 6020A)		(3)Diss Metals (6010C/ 6020A)		VPH (MADEP -VPH)		EPH (MADEP -EPH)		Alk. (2320B)		COD (410.4)		Cl,SO_4 (9056A)		CN- (9012B)		DOC (9060A)		NO_3 /NO_2-N (353.2)		TDS (2540C)							
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	680-183899-1	06/10/20	07/01/20	-	-	-	-	-	-	4	0	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
B	680-183912-1	06/10/20	07/01/20	-	-	4	0	4	0	-	-	-	-	-	-	-	-	4	0	4	0	4	0	4	0	-	-	4	0	4	0						
C	680-183912-2/SN3820	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	5	0	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
D	680-183916-2/SN3818	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	8	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
E	680-183925-1	06/10/20	07/01/20	-	-	1	0	1	0	-	-	-	-	-	-	-	-	1	0	1	0	1	0	1	0	-	-	1	0	1	0						
F	680-183925-2/SN3819	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
G	680-183926-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	7	0	-	-	-	-	7	0	-	-	7	0	-	-	7	0	-	-	-	-						
H	680-183965-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	10	0	-	-	-	-	10	0	-	-	10	0	-	-	10	0	-	-	-	-						
I	680-184026-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	17	0	-	-	-	-	17	0	-	-	17	0	-	-	17	0	-	-	-	-						
J	680-184098-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	12	0	-	-	-	-	12	0	-	-	12	0	-	-	12	0	-	-	-	-						
K	680-184215-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	15	0	-	-	-	-	15	0	-	-	15	0	-	-	15	0	-	-	-	-						
L	680-184220-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	8	0	-	-	-	-	8	0	-	-	8	0	-	-	8	0	-	-	-	-						
M	680-183916-1	06/17/20	07/09/20	6	0	-	-	-	-	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Total	T/PG			6	0	5	0	5	0	9	0	73	0	14	0	5	0	74	0	5	0	74	0	5	0	69	0	5	0	5	0	0	0	0	0	0	354

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 6801840261

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, SHL, Spring 2020
SDG:	6801840261
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:	June 30, 2020

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2320B	SW6010C - Dissolved	SW6020A - Dissolved	SW9056A	SW9060A - Dissolved
EPA-PZ-2012-1A-SPR20	680-184026-1	Water	Field Sample/N	X	X	X	X	X
EPA-PZ-2012-1B-SPR20	680-184026-2	Water	Field Sample/N	X	X	X	X	X
EPA-PZ-2012-2A-SPR20	680-184026-3	Water	Field Sample/N	X	X	X	X	X
EPA-PZ-2012-4A-SPR20	680-184026-4	Water	Field Sample/N	X	X	X	X	X
EPA-PZ-2012-4B-SPR20	680-184026-5	Water	Field Sample/N	X	X	X	X	X
PZ-12-05-SPR20	680-184026-6	Water	Field Sample/N	X	X	X	X	X
PZ-12-08-SPR20	680-184026-7	Water	Field Sample/N	X	X	X	X	X
SHL-10-SPR20	680-184026-8	Water	Field Sample/N	X	X	X	X	X
SHL-19-SPR20	680-184026-9	Water	Field Sample/N	X	X	X	X	X
SHL-DUP05-SPR20	680-184026-10	Water	Field Duplicate/FD	X	X	X	X	X
SHL-DUP06-SPR20	680-184026-11	Water	Field Duplicate/FD	X	X	X	X	X
SHM-05-40X-SPR20	680-184026-12	Water	Field Sample/N	X	X	X	X	X
SHM-07-05X-SPR20	680-184026-13	Water	Field Sample/N	X	X	X	X	X
SHM-11-02-SPR20	680-184026-14	Water	Field Sample/N	X	X	X	X	X
SHM-13-06-SPR20	680-184026-15	Water	Field Sample/N	X	X	X	X	X
SHM-96-5B-SPR20	680-184026-16	Water	Field Sample/N	X	X	X	X	X
SHP-2016-1B-SPR20	680-184026-17	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) 6801840261. 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 0 results (0.00%) out of the 119 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.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW9056A	No additional comments; see Checklist for detail.
SW9060A	No additional comments; see Checklist for detail.

June 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.

No Outliers were associated with this sample delivery group.

Qualified Results

No results associated with this sample delivery group required qualification.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
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?	•			Laboratory duplicate 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 6801840261

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?		•		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 6801840261

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?		•		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 6801840261

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 6801840261

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?	•			
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, Spring 2020
Field Duplicates for SDG: 6801840261

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-SPR20 / SHL-DUP05-SPR20	680-184026-5 / 680-184026-10	Alkalinity, Total (as CaCO3)	160	160	10.0	0.00	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-SPR20 / SHL-DUP05-SPR20	680-184026-5 / 680-184026-10	Iron (FLDFLT)	66000	60000	50.0	9.52	30	OK	NA
EPA-PZ-2012-4B-SPR20 / SHL-DUP05-SPR20	680-184026-5 / 680-184026-10	Manganese (FLDFLT)	640	590	10.0	8.13	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-SPR20 / SHL-DUP05-SPR20	680-184026-5 / 680-184026-10	Arsenic (FLDFLT)	1800	2000	3.00	10.5	30	OK	NA

Location	Analysis
EPA-PZ-2012-4B	SW9056A

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-SPR20 / SHL-DUP05-SPR20	680-184026-5 / 680-184026-10	Chloride	25.0	25.0	2.50	0.00	30	OK	NA
EPA-PZ-2012-4B-SPR20 / SHL-DUP05-SPR20	680-184026-5 / 680-184026-10	Sulfate	12.0	11.0	5.00	8.70	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, Spring 2020
Field Duplicates for SDG: 6801840261

Location	Analysis
EPA-PZ-2012-4B	SW9060A

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-SPR20 / SHL-DUP05-SPR20	680-184026-5 / 680-184026-10	Dissolved Organic Carbon (FLDFLT)	2.60	2.60	1.00	0.00	30	NA	OK

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-SPR20 / SHL-DUP06-SPR20	680-184026-12 / 680-184026-11	Alkalinity, Total (as CaCO3)	110	110	10.0	0.00	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-SPR20 / SHL-DUP06-SPR20	680-184026-12 / 680-184026-11	Iron (FLDFLT)	23000	23000	50.0	0.00	30	OK	NA
SHM-05-40X-SPR20 / SHL-DUP06-SPR20	680-184026-12 / 680-184026-11	Manganese (FLDFLT)	700	700	10.0	0.00	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-SPR20 / SHL-DUP06-SPR20	680-184026-12 / 680-184026-11	Arsenic (FLDFLT)	1900	1900	3.00	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, Spring 2020
Field Duplicates for SDG: 6801840261

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-SPR20 / SHL-DUP06-SPR20	680-184026-12 / 680-184026-11	Chloride	27.0	27.0	2.50	0.00	30	OK	NA
SHM-05-40X-SPR20 / SHL-DUP06-SPR20	680-184026-12 / 680-184026-11	Sulfate	3.10	3.20	5.00	3.17	30	NA	OK

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-SPR20 / SHL-DUP06-SPR20	680-184026-12 / 680-184026-11	Dissolved Organic Carbon (FLDFLT)	1.70	1.60	1.00	6.06	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

March 16, 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 June 10, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #48291:

SDG #	Fraction
680-183899-1, 680-183912-1 680-183912-2/SN3820 680-183916-2/SN3818, 680-183925-1 680-183925-2/SN3819, 680-183926-1 680-183965-1, 680-184026-1 680-184098-1, 680-184215-1 680-184220-1, 680-183916-1	Volatiles, Chlorinated Pesticides, Metals, Wet Chemistry, Volatile Petroleum Hydrocarbons, Extractable Petroleum Hydrocarbons

The data validation was performed under Level II 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

518 pages-ADV R1 (added M) Attachment 1

Stage 2B EQUIS EDD

LDC #48291 (Arcadis-Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260B)		Pest. (8081B)		Metals (6010C /6020A /7470A)		(3) Metals (6010C/ 6020A)		(3)Diss Metals (6010C/ 6020A)		VPH (MADEP -VPH)		EPH (MADEP -EPH)		Alk. (2320B)		COD (410.4)		Cl,SO_4 (9056A)		CN- (9012B)		DOC (9060A)		NO_3 /NO_2-N (353.2)		TDS (2540C)							
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	680-183899-1	06/10/20	07/01/20	-	-	-	-	-	-	4	0	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
B	680-183912-1	06/10/20	07/01/20	-	-	4	0	4	0	-	-	-	-	-	-	-	-	4	0	4	0	4	0	4	0	-	-	4	0	4	0						
C	680-183912-2/SN3820	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	5	0	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
D	680-183916-2/SN3818	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	8	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
E	680-183925-1	06/10/20	07/01/20	-	-	1	0	1	0	-	-	-	-	-	-	-	-	1	0	1	0	1	0	1	0	-	-	1	0	1	0						
F	680-183925-2/SN3819	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
G	680-183926-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	7	0	-	-	-	-	7	0	-	-	7	0	-	-	7	0	-	-	-	-						
H	680-183965-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	10	0	-	-	-	-	10	0	-	-	10	0	-	-	10	0	-	-	-	-						
I	680-184026-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	17	0	-	-	-	-	17	0	-	-	17	0	-	-	17	0	-	-	-	-						
J	680-184098-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	12	0	-	-	-	-	12	0	-	-	12	0	-	-	12	0	-	-	-	-						
K	680-184215-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	15	0	-	-	-	-	15	0	-	-	15	0	-	-	15	0	-	-	-	-						
L	680-184220-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	8	0	-	-	-	-	8	0	-	-	8	0	-	-	8	0	-	-	-	-						
M	680-183916-1	06/17/20	07/09/20	6	0	-	-	-	-	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Total	T/PG			6	0	5	0	5	0	9	0	73	0	14	0	5	0	74	0	5	0	74	0	5	0	69	0	5	0	5	0	0	0	0	0	0	354

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\48291ST.wpd

Data Validation Report for 6801840981

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, SHL, Spring 2020
SDG:	6801840981
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:	June 30, 2020

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2320B	SW6010C - Dissolved	SW6020A - Dissolved	SW9056A	SW9060A - Dissolved
EPA-PZ-2012-2B-SPR20	680-184098-4	Water	Field Sample/N	X	X	X	X	X
SHL-4-SPR20	680-184098-5	Water	Field Sample/N	X	X	X	X	X
SHL-DUP03-SPR20	680-184098-6	Water	Field Duplicate/FD	X	X	X	X	X
SHM-11-06-SPR20	680-184098-7	Water	Field Sample/N	X	X	X	X	X
SHM-13-04-SPR20	680-184098-8	Water	Field Sample/N	X	X	X	X	X
SHP-01-36X-SPR20	680-184098-9	Water	Field Sample/N	X	X	X	X	X
SHP-01-37X-SPR20	680-184098-10	Water	Field Sample/N	X	X	X	X	X
SHP-2016-07A-SPR20	680-184098-11	Water	Field Sample/N	X	X	X	X	X
SHP-2016-2A-SPR20	680-184098-12	Water	Field Sample/N	X	X	X	X	X
SHP-2016-2B-SPR20	680-184098-13	Water	Field Sample/N	X	X	X	X	X
SHP-2016-3A-SPR20	680-184098-14	Water	Field Sample/N	X	X	X	X	X
SHP-2016-3B-SPR20	680-184098-15	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) 6801840981. 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 0 results (0.00%) 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
A2320B	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW9056A	No additional comments; see Checklist for detail.
SW9060A	No additional comments; see Checklist for detail.

June 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.

No Outliers were associated with this sample delivery group.

Qualified Results

No results associated with this sample delivery group required qualification.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
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?	•			Laboratory duplicate 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 6801840981

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?		•		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 6801840981

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?		•		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 6801840981

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 6801840981

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?	•			
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, Spring 2020
Field Duplicates for SDG: 6801840981

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-SPR20 / SHL-DUP03-SPR20	680-184098-7 / 680-184098-6	Alkalinity, Total (as CaCO3)	220	200	10.0	9.52	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-SPR20 / SHL-DUP03-SPR20	680-184098-7 / 680-184098-6	Iron (FLDFLT)	77000	79000	50.0	2.56	30	OK	NA
SHM-11-06-SPR20 / SHL-DUP03-SPR20	680-184098-7 / 680-184098-6	Manganese (FLDFLT)	2000	2000	10.0	0.00	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-SPR20 / SHL-DUP03-SPR20	680-184098-7 / 680-184098-6	Arsenic (FLDFLT)	750	720	3.00	4.08	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-SPR20 / SHL-DUP03-SPR20	680-184098-7 / 680-184098-6	Chloride	50.0	50.0	0.500	0.00	30	OK	NA
SHM-11-06-SPR20 / SHL-DUP03-SPR20	680-184098-7 / 680-184098-6	Sulfate	4.70	4.80	1.00	2.11	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, Spring 2020
Field Duplicates for SDG: 6801840981

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-SPR20 / SHL-DUP03-SPR20	680-184098-7 / 680-184098-6	Dissolved Organic Carbon (FLDFLT)	2.10	1.90	1.00	10.0	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

March 16, 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 June 10, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #48291:

SDG #	Fraction
680-183899-1, 680-183912-1 680-183912-2/SN3820 680-183916-2/SN3818, 680-183925-1 680-183925-2/SN3819, 680-183926-1 680-183965-1, 680-184026-1 680-184098-1, 680-184215-1 680-184220-1, 680-183916-1	Volatiles, Chlorinated Pesticides, Metals, Wet Chemistry, Volatile Petroleum Hydrocarbons, Extractable Petroleum Hydrocarbons

The data validation was performed under Level II 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

518 pages-ADV R1 (added M) Attachment 1

Stage 2B EQUIS EDD

LDC #48291 (Arcadis-Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260B)		Pest. (8081B)		Metals (6010C /6020A /7470A)		(3) Metals (6010C/ 6020A)		(3)Diss Metals (6010C/ 6020A)		VPH (MADEP -VPH)		EPH (MADEP -EPH)		Alk. (2320B)		COD (410.4)		Cl,SO_4 (9056A)		CN- (9012B)		DOC (9060A)		NO_3 /NO_2-N (353.2)		TDS (2540C)							
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	680-183899-1	06/10/20	07/01/20	-	-	-	-	-	-	4	0	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
B	680-183912-1	06/10/20	07/01/20	-	-	4	0	4	0	-	-	-	-	-	-	-	-	4	0	4	0	4	0	4	0	-	-	4	0	4	0						
C	680-183912-2/SN3820	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	5	0	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
D	680-183916-2/SN3818	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	8	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
E	680-183925-1	06/10/20	07/01/20	-	-	1	0	1	0	-	-	-	-	-	-	-	-	1	0	1	0	1	0	1	0	-	-	1	0	1	0						
F	680-183925-2/SN3819	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
G	680-183926-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	7	0	-	-	-	-	7	0	-	-	7	0	-	-	7	0	-	-	-	-						
H	680-183965-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	10	0	-	-	-	-	10	0	-	-	10	0	-	-	10	0	-	-	-	-						
I	680-184026-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	17	0	-	-	-	-	17	0	-	-	17	0	-	-	17	0	-	-	-	-						
J	680-184098-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	12	0	-	-	-	-	12	0	-	-	12	0	-	-	12	0	-	-	-	-						
K	680-184215-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	15	0	-	-	-	-	15	0	-	-	15	0	-	-	15	0	-	-	-	-						
L	680-184220-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	8	0	-	-	-	-	8	0	-	-	8	0	-	-	8	0	-	-	-	-						
M	680-183916-1	06/17/20	07/09/20	6	0	-	-	-	-	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Total	T/PG			6	0	5	0	5	0	9	0	73	0	14	0	5	0	74	0	5	0	74	0	5	0	69	0	5	0	5	0	0	0	0	0	0	354

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 6801842151

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, SHL, Spring 2020
SDG:	6801842151
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:	June 30, 2020

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2320B	SW6010C - Dissolved	SW6020A - Dissolved	SW9056A	SW9060A - Dissolved
EPA-PZ-2012-3A-SPR20	680-184215-1	Water	Field Sample/N	X	X	X	X	X
EPA-PZ-2012-3B-SPR20	680-184215-2	Water	Field Sample/N	X	X	X	X	X
SHL-DUP04-SPR20	680-184215-3	Water	Field Duplicate/FD	X	X	X	X	X
SHM-05-41B-SPR20	680-184215-4	Water	Field Sample/N	X	X	X	X	X
SHM-05-41C-SPR20	680-184215-5	Water	Field Sample/N	X	X	X	X	X
SHM-13-03-SPR20	680-184215-6	Water	Field Sample/N	X	X	X	X	X
SHM-93-22B-SPR20	680-184215-7	Water	Field Sample/N	X	X	X	X	X
SHP-01-38A-SPR20	680-184215-8	Water	Field Sample/N	X	X	X	X	X
SHP-2016-06A-SPR20	680-184215-9	Water	Field Sample/N	X	X	X	X	X
SHP-2016-06B-SPR20	680-184215-10	Water	Field Sample/N	X	X	X	X	X
SHP-2016-06C-SPR20	680-184215-11	Water	Field Sample/N	X	X	X	X	X
SHP-2016-4A-SPR20	680-184215-12	Water	Field Sample/N	X	X	X	X	X
SHP-2016-4B-SPR20	680-184215-13	Water	Field Sample/N	X	X	X	X	X
SHP-2016-5A-SPR20	680-184215-14	Water	Field Sample/N	X	X	X	X	X
SHP-2016-5B-SPR20	680-184215-15	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) 6801842151. 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 0 results (0.00%) 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
A2320B	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW9056A	No additional comments; see Checklist for detail.
SW9060A	No additional comments; see Checklist for detail.

June 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
CCB 680-620833/154 (CB)/ CCB 680-620833/154	Iron	18.90	< 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, 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
MB 680-621071/1-A (LB)/ MB 680-621071/1-A	Manganese	8.570	< 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.

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
EPA-PZ-2012-3B-SPR20 (MS)/ 680-184215-2	Manganese	32.50	90 - 114	10 - 125	percent	J/UJ	M	Spike amount Insignificant
EPA-PZ-2012-3B-SPR20 (SD)/ 680-184215-2	Manganese	50.00	90 - 114	10 - 125	percent	J/UJ	M	Spike amount Insignificant
EPA-PZ-2012-3B-SPR20 (MS)/ 680-184215-2	Iron	76.00	87 - 115	10 - 125	percent	J/UJ	M	Spike amount Insignificant
EPA-PZ-2012-3B-SPR20 (SD)/ 680-184215-2	Iron	86.00	87 - 115	10 - 125	percent	J/UJ	M	Spike amount Insignificant
SHM-05-41C-SPR20 (MS)/ 680-184215-5	Manganese	75.00	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-2012-3B-SPR20 (SD)/ 680-184215-2	Arsenic	-350.0	84 - 116	10 - 125	percent	J/X	M	Spike amount Insignificant
EPA-PZ-2012-3B-SPR20 (MS)/ 680-184215-2	Arsenic	-400.0	84 - 116	10 - 125	percent	J/X	M	Spike amount Insignificant
SHM-05-41C-SPR20 (SD)/ 680-184215-5	Arsenic	179.0	84 - 116	10 - 125	percent	J/None	M	Spike amount Insignificant
SHM-05-41C-SPR20 (MS)/ 680-184215-5	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 SW9056A, 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-SPR20 (MS)/ 680-184215-5	Chloride	-500.0	90 - 110	10 - 110	percent	J/X	M	Spike amount Insignificant
SHM-05-41C-SPR20 (SD)/ 680-184215-5	Chloride	-500.0	90 - 110	10 - 110	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.

Qualified Results

No results associated with this sample delivery group required qualification.

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
EPA-PZ-2012-3A-SPR20	N	Manganese	10.0	890	890 J	890	
EPA-PZ-2012-3B-SPR20	N	Manganese	10.0	5600 J	5600 J	5600	
SHL-DUP04-SPR20	FD	Manganese	10.0	1300	1300 J	1300	
SHM-05-41B-SPR20	N	Manganese	10.0	740	740 J	740	
SHM-05-41C-SPR20	N	Iron	50.0	14000	14000 J	14000	
SHM-05-41C-SPR20	N	Manganese	10.0	2400 J	2400 J	2400	
SHM-13-03-SPR20	N	Manganese	10.0	11000	11000 J	11000	
SHM-93-22B-SPR20	N	Manganese	10.0	9300	9300 J	9300	
SHP-01-38A-SPR20	N	Manganese	10.0	1200	1200 J	1200	
SHP-2016-06A-SPR20	N	Manganese	10.0	920	920 J	920	
SHP-2016-06B-SPR20	N	Manganese	10.0	430	430 J	430	
SHP-2016-06C-SPR20	N	Manganese	10.0	200	200 J	200	
SHP-2016-4A-SPR20	N	Iron	50.0	68.0	50.0 U	68.0	
SHP-2016-4A-SPR20	N	Manganese	10.0	70.0	70.0 J	70.0	
SHP-2016-4B-SPR20	N	Manganese	10.0	1900	1900 J	1900	
SHP-2016-5B-SPR20	N	Manganese	10.0	2500	2500 J	2500	

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?	•			The laboratory duplicate 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 6801842151

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?		•		Manganese was detected in a method blank. The associated sample results were either not detected or significantly greater than the concentration in the method blank, therefore no data were qualified. Iron was detected in a calibration blank. The affected samples were reanalyzed for iron and no contamination was found in the calibration blanks.
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, the parent results were greater than 4x the spike amount, therefore no qualification was necessary.
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: 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 was not within project acceptance limits, the parent results were greater than 4x the spike amount, therefore no qualification was necessary.
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: 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?		•		Although chloride was not within project acceptance limits, the parent result was greater than 4x the spike amount, therefore no qualification was necessary.
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 6801842151

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?	•			
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, Spring 2020
Field Duplicates for SDG: 6801842151

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-SPR20 / SHL-DUP04-SPR20	680-184215-8 / 680-184215-3	Alkalinity, Total (as CaCO3)	60.0	60.0	10.0	0.00	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-SPR20 / SHL-DUP04-SPR20	680-184215-8 / 680-184215-3	Iron (FLDFLT)	13000	15000	50.0	14.3	30	OK	NA
SHP-01-38A-SPR20 / SHL-DUP04-SPR20	680-184215-8 / 680-184215-3	Manganese (FLDFLT)	1200	1300	10.0	8.00	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-SPR20 / SHL-DUP04-SPR20	680-184215-8 / 680-184215-3	Arsenic (FLDFLT)	87.0	86.0	3.00	1.16	30	OK	NA

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-SPR20 / SHL-DUP04-SPR20	680-184215-8 / 680-184215-3	Chloride	0.490	0.480	0.500	2.06	30	NA	OK
SHP-01-38A-SPR20 / SHL-DUP04-SPR20	680-184215-8 / 680-184215-3	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"

Field Duplicate Report By SDG
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, SHL, Spring 2020
Field Duplicates for SDG: 6801842151

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-SPR20 / SHL-DUP04-SPR20	680-184215-8 / 680-184215-3	Dissolved Organic Carbon (FLDFLT)	1.10	1.10	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

March 16, 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 June 10, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #48291:

SDG #	Fraction
680-183899-1, 680-183912-1 680-183912-2/SN3820 680-183916-2/SN3818, 680-183925-1 680-183925-2/SN3819, 680-183926-1 680-183965-1, 680-184026-1 680-184098-1, 680-184215-1 680-184220-1, 680-183916-1	Volatiles, Chlorinated Pesticides, Metals, Wet Chemistry, Volatile Petroleum Hydrocarbons, Extractable Petroleum Hydrocarbons

The data validation was performed under Level II 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

518 pages-ADV R1 (added M) Attachment 1

Stage 2B EQUIS EDD

LDC #48291 (Arcadis-Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260B)		Pest. (8081B)		Metals (6010C /6020A /7470A)		(3) Metals (6010C/ 6020A)		(3)Diss Metals (6010C/ 6020A)		VPH (MADEP -VPH)		EPH (MADEP -EPH)		Alk. (2320B)		COD (410.4)		Cl,SO_4 (9056A)		CN- (9012B)		DOC (9060A)		NO_3 /NO_2-N (353.2)		TDS (2540C)							
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	680-183899-1	06/10/20	07/01/20	-	-	-	-	-	-	4	0	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
B	680-183912-1	06/10/20	07/01/20	-	-	4	0	4	0	-	-	-	-	-	-	-	-	4	0	4	0	4	0	4	0	-	-	4	0	4	0						
C	680-183912-2/SN3820	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	5	0	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
D	680-183916-2/SN3818	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	8	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
E	680-183925-1	06/10/20	07/01/20	-	-	1	0	1	0	-	-	-	-	-	-	-	-	1	0	1	0	1	0	1	0	-	-	1	0	1	0						
F	680-183925-2/SN3819	06/10/20	07/01/20	-	-	-	-	-	-	-	-	-	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
G	680-183926-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	7	0	-	-	-	-	7	0	-	-	7	0	-	-	7	0	-	-	-	-						
H	680-183965-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	10	0	-	-	-	-	10	0	-	-	10	0	-	-	10	0	-	-	-	-						
I	680-184026-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	17	0	-	-	-	-	17	0	-	-	17	0	-	-	17	0	-	-	-	-						
J	680-184098-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	12	0	-	-	-	-	12	0	-	-	12	0	-	-	12	0	-	-	-	-						
K	680-184215-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	15	0	-	-	-	-	15	0	-	-	15	0	-	-	15	0	-	-	-	-						
L	680-184220-1	06/10/20	07/01/20	-	-	-	-	-	-	-	-	8	0	-	-	-	-	8	0	-	-	8	0	-	-	8	0	-	-	-	-						
M	680-183916-1	06/17/20	07/09/20	6	0	-	-	-	-	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Total	T/PG			6	0	5	0	5	0	9	0	73	0	14	0	5	0	74	0	5	0	74	0	5	0	69	0	5	0	5	0	0	0	0	0	0	354

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\48291ST.wpd

Data Validation Report for 6801842201

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, SHL, Spring 2020
SDG:	6801842201
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:	June 30, 2020

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2320B	SW6010C - Dissolved	SW6020A - Dissolved	SW9056A	SW9060A - Dissolved
EPA-PZ-2012-5A-SPR20	680-184220-3	Water	Field Sample/N	X	X	X	X	X
EPA-PZ-2012-5B-SPR20	680-184220-4	Water	Field Sample/N	X	X	X	X	X
EPA-PZ-2012-6A-SPR20	680-184220-5	Water	Field Sample/N	X	X	X	X	X
EPA-PZ-2012-6B-SPR20	680-184220-6	Water	Field Sample/N	X	X	X	X	X
EPA-PZ-2012-7A-SPR20	680-184220-7	Water	Field Sample/N	X	X	X	X	X
EPA-PZ-2012-7B-SPR20	680-184220-8	Water	Field Sample/N	X	X	X	X	X
SHM-13-07-SPR20	680-184220-2	Water	Field Sample/N	X	X	X	X	X
SHM-13-08-SPR20	680-184220-1	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) 6801842201. 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 (1.79%) 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
A2320B	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW9056A	No additional comments; see Checklist for detail.
SW9060A	No additional comments; see Checklist for detail.

June 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
CCB 680-621030/180 (CB)/ CCB 680-621030/180	Iron	21.10	< 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.

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
MB 680-620848/1-A (LB)/ MB 680-620848/1-A	Iron	19.60	< 17	< 50	ug/l	U/None	L	
MB 680-621071/1-A (LB)/ MB 680-621071/1-A	Manganese	8.570	< 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
EPA-PZ-2012-7A-SPR20	N	Manganese	10.0	10.0 B	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.

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-2012-7A-SPR20	N	Manganese	10.0	10.0 B	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.

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
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 was 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 6801842201

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, one manganese result was qualified non-detected (U) at the LOQ. Iron was detected in a method blank and a calibration balnk, however the associated sample results were either not detected or significantly greater than the concentration found in the blanks, therefore no iron results 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 or as qualified during data validation.

Data Validation Report for 6801842201

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?		•		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 6801842201

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 6801842201

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.

Attachment 4

Response to Comments

Response to Comments
Tech Memo Phase I Subtask 2.d
Shepley's Hill Landfill
Fort Devens, MA
August 2021

Comment No.	Reviewer	Section & Page Number	Comment	Response
1	EPA	Figures 4, 7, and 8	The top of bedrock elevation in these figures should be revised to account for the fact that termination of each direct push vertical profile was at or somewhat above the actual bedrock surface. The current presentation of data mis-represent the deepest sampled intervals as occurring within bedrock at profile locations SB-2017-08, SB-2017-10, and SB-2017-12.	Stratigraphy on cross-section Figures 4, 7, and 8 is presented based on the most up to date information included on Figure 5-8 of the September 2020 Area 2 Preliminary Site Characterization Summary PFAS Remedial Investigation by KOMAN Government Solutions, LLC. The maximum sampling depths for SB-2017-08, SB-2017-10, and SB-2017-12 are 94.60 to 96.60, 72.0 to 74.0, and 99.0 to 101.0 feet below land surface, respectively. The bedrock surface on those figures have been adjusted to the termination point of the direct push vertical profile borings for SB-2017-08, SB-2017-10, and SB-2017-12 to reflect that no samples were collected within the bedrock.
2	EPA	Figures 3, 5, and 6, and Table 3	The eastern edge of the "Interpreted Area of Arsenic > 10 ug/L" shown in Figures 3, 5 and 6 appear to be influenced by an incorrect reported arsenic value for monitoring location EPA-PZ-2012-1B for the October/November 2020 sampling round. Inspection of the chemistry data for this sampling round relative to historical observations of groundwater chemistry for the monitoring network indicate that results reported for monitoring locations EPA-PZ-2012-1B and EPA-PZ-2012-4A are switched. This is confirmed by inspection of the other laboratory chemical parameters reported in Table 3. The attached Graph 1 summarizes arsenic concentration data reported for groundwater at key locations since startup of the ATP system (top panel). As currently reported, the arsenic plume disappeared at location EPA-PZ-2012-1B and a new shallow arsenic plume appeared at location EPA-PZ-2012-4A. Inspection of arsenic concentration data at monitoring location SHM-93-22B (aka SHM-96-22B) for October/November 2020 is consistent with the historical trend from upgradient location EPA-PZ-2012-1B. Please revise the eastern edge of the plume edge to include location EPA-PZ-2012-1B and flag data reported for locations EPA-PZ-2012-1B and EPA-PZ-2012-4A as likely erroneous. Likewise, inspection of calculated horizontal gradients between August 2016 and November 2020 highlight erroneous reported groundwater elevation values for locations SHM-10-06, SHM-10-06A and SHM-93-22B (aka SHM-96-22B) during the November 4, 2020 synoptic round of water level measurements (Graph 1, bottom panel). The value reported for location SHM-93-22B appears to be 1-foot too low, and the values reported for locations SHM-10-06 and SHM-10-06A appear to be switched. Please note that the only date after ATP installation at which the groundwater elevation was lower at SHM-10-06A relative to SHM-10-06 was when Plow Shop Pond was partially drained to facilitate sediment dredging in the AOC-72 area. It is also recommended that these erroneous groundwater elevation data be flagged for this and related monitoring data reports.	Arsenic and additional laboratory analytical data for EPA-PZ-2012-1B and EPA-PZ-2012-4A do appear to have been switched and have been corrected in Table 3 and on Figures 3, 5, and 6. The monitoring well SHM-96-22B cannot be found in Tech Memo 2 or listed in the Devens LTM chemical database however, the well SHM-93-22B is in the list of wells. From the discussion above, EPA-PZ-2012-1B value (210.0 ug/L) is considered valid and Figures 5 and 6 have been updated to show that the interpreted area of arsenic > 10 ug/L includes piezometer EPA-PZ-2012-1B. As discussed in the Technical Memo 1 Responses to Comments, 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. SHM-93-22B did appear to have some erroneous water level measurements throughout the analysis period and was thus not used as part of the 3PE analyses nor in generating groundwater elevation contours.

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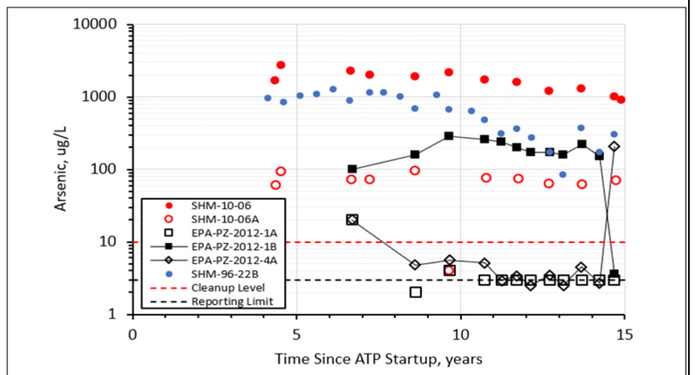
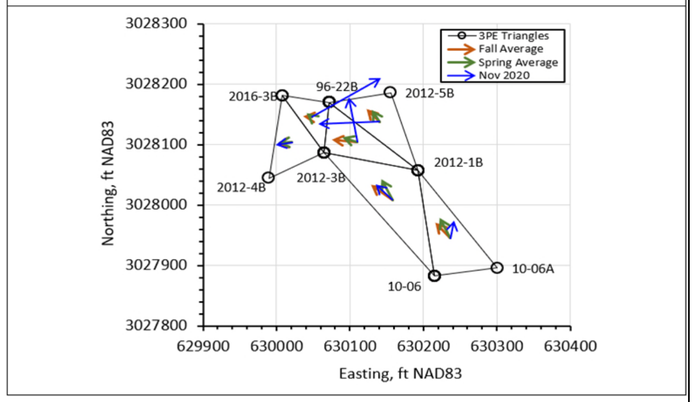
2a			 	
3	MassDEP	Section 3.1	The suggested association of groundwater with elevated arsenic concentrations in deep overburden and "geogenic" sources of arsenic is speculative. High arsenic concentrations in deep overburden along the 2017 vertical profile transect are attributable to groundwater flowpaths that extend upgradient to the part of the landfill where the highest arsenic concentrations and strongest reducing conditions occur (e.g., Final Tech Memo 1, Figure 26). These flowpaths descend from the landfill into the deeper overburden as the overburden thickens going downgradient, a common occurrence at many Devens cleanup sites. Refer to MassDEP comments on Tech Memo 1 for additional explanation.	The text has been revised to say: "The presence of higher arsenic concentrations at greater depths in the overburden correlates with potential sources of geogenic arsenic described in Technical Memo 1 (S-A JV, 2021), which likely includes a combination of arsenic naturally released from bedrock due to oxidative dissolution of sulfide minerals, as well as arsenic released from overburden due to reductive dissolution of oxyhydroxide minerals resulting from natural and landfill-derived organic carbon." As mentioned in Technical Memo 1 and the associated responses to comments, there is evidence that oxidation of arsenic-containing minerals in bedrock is a source of geogenic arsenic to groundwater. Sulfate concentrations in bedrock monitoring wells up to 76 mg/L in the absence of elevated iron and manganese concentrations are consistent with potential sulfide oxidation in bedrock groundwater. It is true that higher concentrations of arsenic in groundwater correlate with greater reducing conditions in the overburden. However, although the relative proportion of bedrock and overburden geogenic sources in overburden groundwater is unknown, the potential for contribution of bedrock arsenic to overburden groundwater due to oxidation of arsenic-containing minerals in bedrock is not speculative. The 2012 *Final Shepley's Hill Bedrock Investigation* by Gannett Fleming, Inc. (sponsored by the USEPA Region 1) and 2011 USGS investigation report *Arsenic and Uranium in Water from Private Wells in Bedrock of East-Central Massachusetts - Concentrations, Correlations with Bedrock Units, and Estimated Probability Maps* provide data supporting the association of arsenic concentrations in deep overburden with this geogenic bedrock source of arsenic.
4	MassDEP	Section 4, Fourth Paragraph	Site data do not support the conclusion that the extent of the capture zone of the extraction wells during 2016–2020 was wide enough to "encompass the entire SHL boundary". While most of the mobilized arsenic between wells SHL-23 and SHM-10-06 may have been captured, the portion of the mobilized arsenic that was not captured was sufficient to sustain the arsenic plume that extends from the extraction wells to Nonacoicus Brook, and the downgradient arsenic concentrations indicate that the quantity of mobilized arsenic not captured is a substantially larger than the "small gap in capture on the eastern side of the capture zone" suggested here. Additional explanation is provided in subsequent comments.	As stated in subsequent responses to comments, there are areas where groundwater may not be captured at all times (i.e., to the northeast of the landfill cap). Additional evaluation of groundwater capture using the SHL Groundwater Model is included in Technical Memo, 4 and Technical Memo 5 includes an estimate of the estimated arsenic mass that may not be captured at all times. Technical Memo 5 evaluates arsenic concentration trends at wells within the NIA and Nearfield Areas, including wells with sampling histories sufficient to evaluate arsenic concentration trends both before and after the installation of the ATP extraction system (March 2006).

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5	MassDEP	Figure 3	The indicated gap between the part of the landfill where arsenic concentrations exceed 1,000 ug/L and the downgradient area in the NIA where arsenic concentrations exceed 1,000 ug/L (e.g., well SHM-10-16) probably does not exist. Piezometers SHP-2016-2B and SHP-2016-5B, where samples with concentrations less than 1,000 ug/L were collected, do not extend deep enough to intercept the core of the arsenic plume (piezometer screens were placed for hydraulic measurements and did not target the arsenic plume). Arsenic concentrations in groundwater samples collected at greater depths from vertical profiles at these locations in 2017 were well above 1,000 ug/L (SB-2017-02: 2,400 ug/L and SB-2017-05: 2,500 ug/L). The presence of a continuous band of groundwater containing arsenic with concentrations exceeding 1,000 ug/L extending from the landfill to West Main Street and beyond indicates the extraction system was not capturing enough mobilized arsenic to reduce arsenic concentrations in the NIA to below 1,000 ug/L.	The interpreted area of arsenic exceeding 1,000 ug/L is drawn based on the posted 2020 data for monitoring wells. While the Army agrees that there are areas where groundwater may not be captured at all times, work performed to date and summarized in the Technical Memos supports that this area is to the northeast of the landfill cap and not in the area of arsenic exceeding 1,000 ug/L identified in the comment. Additionally, SHM-05-41B, located in the gap noted in the comment, had concentrations of arsenic present averaging ~2,500 ug/L in 2006 following its installation, which have reduced to 570 ug/L in 2020. The monitoring wells that continue to have a concentration exceeding 1,000 ug/L in the NIA were installed and sampled for the first time just as the ATP was beginning to operate or after that date. There are no pre-operational arsenic concentrations for these locations (i.e. SHM-13-06, SHM-10-16, and the SHP-2016 series monitoring wells). SHM-05-40X, located in the NIA and with an As concentration of 2,100 ug/L in 2020, was sampled first in 2006 when the ATP first began to operate. At that time, the arsenic concentration at that well, downgradient of the approved design capture zone of the ATP (approximately 450 ft hydraulically downgradient of the base boundary), was already greater than 3,000 to 4,000 ug/L. Concentrations of arsenic in groundwater in the NIA exceeding 1,000 ug/L, both in 2006 and in 2020, are not indicative of a failure of the ATP to capture the plume in the area it was designed to do so - along the base boundary to the north of the landfill. Also, as discussed in Technical Memo 1, there are strongly reducing geochemical conditions present and are also likely geogenic contributions to arsenic in the NIA that the ATP was not designed to address. Technical Memo 5 will evaluate and discuss arsenic trends in NIA and Nearfield area wells, in addition to calculating the estimated groundwater flow and associated arsenic mass flux through the area to the northeast of the landfill cap that may not always be captured. A focused feasibility study to evaluate alternatives for SHL groundwater will also be prepared to determine if there are more appropriate alternatives.
6	MassDEP	Figures 5 and 6	Please refer to MassDEP comments on Tech Memo 1. In summary, site data indicate that the extent of capture is less than inferred in these figures. In addition, the boundary of the area with arsenic above 10 ug/L may be inaccurate at location EPA-PZ-2012-1B because the screen of piezometer EPA-PZ-2012-1B was placed above the core of the arsenic plume (piezometer screens were placed for hydraulic measurements and did not target the arsenic plume).	Please see response to Comment 2, EPA-PZ-2012-1B is now shown to be in the interpreted area of arsenic above 10 ug/L. As stated in the Technical Memo 1 Responses to Comments, 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.
7	MassDEP	Figures 7 and 8	A comparison of arsenic concentrations shown in these figures to arsenic concentrations reported in samples collected from locations downgradient of the extraction wells indicates that the estimated capture zones shown in these figures are significantly larger than those that existed at the site during 2016 to 2020. The highest concentration in the samples collected outside the estimated average spring capture zone in Figure 7 was 110 ug/L (SB-2017-12) and outside the average fall capture zone (Figure 8) was 350 ug/L (SHP-2016-06C). Concentrations in numerous wells located downgradient of the extraction wells substantially exceed these concentrations. For example, arsenic concentrations exceeding 1,000 ug/L were reported in Fall 2020 groundwater samples collected from well SHM-10-16 (1,100 ug/L), well SHM-05-40X (2,100 ug/L), and well SHM-13-04 (2,200 ug/L) (Figure 3), indicating that some portion of the capture areas where concentrations exceeding 1,000 ug/L depicted in Figures 7 and 8 escaped capture. In particular, the capture zone may not have extended far enough east to capture groundwater with concentrations exceeding 1,000 ug/L at SHM-10-06 (1,000 ug/L), SB-2017-11 (1,900 ug/L), and/or SB-2017-10 (2,500 ug/L). To the west, groundwater with high concentrations extending into bedrock at SHM-2016-06B (1,100 ug/L) and SB-2017-08 (7,600 ug/L) may have been outside the actual capture zone, contributing to the high concentrations downgradient of the extraction wells. A focused investigation would be required to determine how the extraction system could be adjusted or enhanced to capture the high concentrations areas that were not captured during 2016–2020.	The primary performance objective for the design of the SHL ATP extraction system is to intercept the arsenic plume in the vicinity of the base boundary near the north end of the landfill (CH2MHILL, 2005). Although arsenic concentrations in the immediate vicinity of the ATP have improved, the data reviewed for this, and subsequent technical memoranda, demonstrate the operation of the ATP will not result in the achievement of cleanup goals in the downgradient areas. The reasons for this are twofold. First, and as stated above in response to Comment #5, there were already concentrations of arsenic exceeding 3,000 to 4,000 ug/L in the NIA, more than 400 feet beyond the approved design capture zone of the ATP, when it began operating in 2006. The ATP is not designed to "capture" arsenic currently within this zone. Secondly, the data indicate that both anthropogenic and geogenic sources of arsenic are present, and will persist, downgradient of the ATP regardless of the ATP's operational status. For example, in the NIA, arsenic is likely mobilized from the bedrock and resists coprecipitation due to naturally reducing conditions associated with the presence of wetlands in that area. These conditions are likely to result in extended or even unachievable cleanup timeframes for the NIA and Nearfield area. In accordance with the EPA SOW, a focused feasibility study to evaluate remedial alternatives will be prepared to determine if there is a more appropriate groundwater remedy for SHL.
8	MassDEP	Attachments 1, 2, and 3	Many of the records provided here duplicate records provided in the 2020 Annual Report. The duplicated records could be removed from the report to avoid confusion and shorten the memo.	The Technical Memos are meant to be stand alone documents to address the USEPA's SOW and are inclusive of all of the data requested to be part of the documents in the SOW.