DVIA MAYOIO0 C#1/3 8.4

2000 ANNUAL REPORT

SHEPLEY'S HILL LANDFILL LONG TERM MONITORING & MAINTENANCE DEVENS, MASSACHUSETTS

May 2001

PREPARED BY:

DEPARTMENT OF ARMY NEW ENGLAND DISTRICT, CORPS OF ENGINEERS CONCORD, MASSACHUSETTS 01742



US Army Corps of Engineers New England District

1A 01051 USAS

DVIAMayo100 C# 13 8.4 May 2001



DEPARTMENT OF THE ARMY DEVENS RESERVE FORCES TRAINING AREA DEVENS, MASSACHUSETTS, 01432

May 29, 2001

BRAC Environmental Office

Mr. David Heislein, HLA 107 Audobon Road Wakefield, MA 01880

Dear Mr. Heislein:

Enclosed for your records, pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments Reauthorization Act of 1986, is the following document:

> 2000 Annual Report Long Term Monitoring Plan Shepley's Hill Landfill Devens Reserve Forces Training Area Devens, Massachusetts

If you have any questions regarding this matter, you may contact me at (978) 796-3114.

Sincerely,

James C. Chambers BRAC Environmental Coordinator

Enclosures



DEPARTMENT OF THE ARMY NEW ENGLAND DISTRICT, CORPS OF ENGINEERS 696 VIRGINIA ROAD CONCORD, MASSACHUSETTS 01742-2751



May 29, 2001

Engineering Management

Subject: 2000 Annual Report, Shepley's Hill Landfill, Long Term Monitoring

Mr. Jim Chambers BRAC Environmental Coordinator Box 100 30 Quebec Street Devens, Massachusetts 01432-4429

Dear Mr. Chambers:

The U.S. Army Corps of Engineers, New England District has completed preparation of the 2000 Annual Report for Shepley's Hill Landfill in accordance with the Long Term Monitoring and Maintenance Plan.

Enclosed please find five copies for your review. Additionally, we have forwarded copies of the subject document as follows:

Ayer Public Library Harvard Public Library Hazen Memorial Library Lancaster Public Library Mr. V. Bonilla, FORSCOM Mr. T. Poole, EMO **HTRW** Center of Expertise Ms. J. Brattstrom, USAEC Ms. C. Keating, USEPA Mr. F. Lyford, USGS Mr. J. Regan, MADEP Ms. J. Hall, TRC Mr. R. Lidstone, Lancaster ConCom Mr. F.T. Prior, USFWS Ms. E. Ainsley Campbell, NRWA Ms. L. Michaud, MRPC

1 Copy 1 Copy 1 Copy 1Copy **3** Copies **Executive Summary** 2 Copies 2 Copy 4 Copies 1 Copy **3** Copies 1 Copy 1 Copy 1 Copy 1 Copy 1 Copy

Mr. R. Ostrowski, MDFA, DCC Ms. D. Gevalt, H&A for DCC Ms. L. Nehring, PACE Mr. R. Doherty, DSI for PACE Administrative Record, HLA Mr. T. Linden, Town of Shirley Mr. B. Murray Mr. D. Maclver Mr. M. Coonan Rev. P. Goff Mr. W. Marshall Ms. E. Roddis Ms. K. Bourassa, Town of Shirley Mr. L. Guercio, Town of Shirley Ms. L. Wallace, Town of Harvard Mr. J. Petrin, Town of Harvard Ms. J. Corenzwit, Town of Ayer Mr. C. Sullivan, Town of Ayer Ms. A. Turner, Town of Lancaster

1 Copy 1 Copy 1 Copy 1 Copy 4 Copies **Executive Summary Executive Summary Executive Summary Executive Summary Executive Summary Executive Summary Executive Summary** 1 Copy Executive Summary **Executive Summary Executive Summary Executive Summary** Executive Summary Executive Summary

If you have any questions, please call me at (978) 318-8627.

Sincerely,

Mang

David Margolis, P.E. Engineering Manager

Enclosures

SHEPLEY'S HILL LANDFILL 2000 ANNUAL REPORT

SHEPLEY'S HILL LANDFILL DEVENS, MASSACHUSETTS

May 2001

SHEPLEY'S HILL LANDFILL 2000 ANNUAL REPORT

TABLE OF CONTENTS

Sectio	n <u>Title</u>	Page
	EXECUTIVE SUMMARY	
1.0	INTRODUCTION	
2.0	LANDFILL CAP MAINTENANCE ACTIVITIES	
3.0	LANDFILL CAP MONITORING ACTIVITIES	5
4.0	LANDFILL GAS MONITORING RESULTS	
5.0	GROUNDWATER ELEVATIONS	
6.0	GROUNDWATER SAMPLING	
6.1	Preparation for Sampling	
6.2 6.3	Sampling	
7.0	LABORATORY TESTING	
7.1	Analyses	
7.2	Results	
7.2	.1 Results for Samples Collected Spring 2000	
7.2	.2 Results for Samples Collected Fall 2000	
8.0	QUALITY CONTROL	
8.1	Field Quality Control	
8.2	Laboratory Quality Control	
8.3	Data Evaluation	
8.3	.1 Data Evaluation for Samples Collected Spring 2000	
8.3	.2 Data Evaluation for Samples Collected Fall 2000	
9.0	CORRECTIVE ACTION	

SHEPLEY'S HILL LANDFILL 2000 ANNUAL REPORT

TABLE OF CONTENTS (Cont.)

TABLES

Table 5-1	Monitoring Wells and Elevations	
Table 6-1	Monitoring Well Designations	
Table 7-1	Groundwater Sample Analysis and Procedures	
Table 7-2	Groundwater Analytical Results - May 2000	20
Table 7-3	Groundwater Analytical Results - October/November 2000	
Table 7-4	Comparison of Historic Arsenic Results	
Table 8-1	Sample Preparation and Analysis Methods	

FIGURES

Figure 3-1	Shepley's Hill Landfill - Findings of Inspection
	Conducted 31 October 2000 plan folder
Figure 4-1	Shepley's Hill Landfill - Groundwater Monitoring plan folder
Figure 5-1	Geologic Cross Section - reprinted from:
	Draft Shepley's Hill Landfill Supplemental Groundwater Investigation
Figure 6-1	Long-Term Monitoring Plan Wells - reprinted from:
	Draft Shepley's Hill Landfill Supplemental Groundwater Investigation17

APPENDICES

- Appendix A Landfill Maintenance Checklist
- Appendix B Landfill Gas Monitoring Forms
- Appendix C Groundwater Field Analysis Forms
- Appendix D Chain of Custody Forms
- Appendix E Comparison of Arsenic Results
- Appendix F Quality Assurance Reports
- Appendix G Groundwater Analytical Data
- Appendix H References

EXECUTIVE SUMMARY

This annual report has been prepared to document the monitoring and maintenance activities conducted at the Shepley's Hill Landfill in Devens, Massachusetts as required by the Record of Decision (ROD) for areas of contamination 4, 5, and 18 (ABB-ES, Oct 1995). This report was developed by the U.S. Army Corps of Engineers (USACE), New England District (NAE).

This report documents the results of the fifth year (2000) of the Long Term Monitoring and Maintenance conducted in accordance with the approved Long Term Monitoring and Maintenance Plan (SWEC, May 1996). Activities conducted as part of the Long Term Monitoring and Maintenance Plan include a yearly inspection of the landfill cover, yearly landfill gas vent monitoring, as well as semi-annual groundwater sampling. Post closure monitoring is required for a period of thirty years.

An annual landfill inspection was conducted and observations were made regarding the vegetative cover, vegetation types, erosion, settlement, and general condition of the various features. The landfill is in fair condition, and appears to be functioning adequately. The cover surface was noted to contain areas of sparse vegetation, intrusive vegetation and settlement. Intermittent standing water, erosion, overgrown areas and wetlands plants were observed in isolated areas within drainage swales. The access roads on the cap are in good condition. The security fence was noted to be in need of some repair. There were no conditions observed which would immediately jeopardize the integrity of the landfill cap. Combustible gas readings were collected from eighteen gas vents on the landfill. The gas readings are within the parameters of a mature landfill. The vents are functioning properly.

The fifth year of long-term groundwater sampling was performed on the fourteen compliance point monitoring wells located adjacent to the landfill on the north and east. Samples were collected in accordance with the *EPA's Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells* (July 1996). Samples were analyzed for volatile organic compounds, inorganics, and general water quality parameters.

In accordance with the Record of Decision, the effectiveness of the selected Alternative SHL-2 is determined by evaluating groundwater sampling results from two groups of monitoring wells. Wells are designated as either Group 1 or Group 2 wells. Group 1 wells are wells where all chemical of concern concentrations have historically met or been below cleanup levels established in the Record of Decision. Group 2 wells are wells where chemical of concern concentrations have exceeded cleanup levels. In the Long Term Monitoring and Maintenance Plan, all existing wells were designated as Group 2 wells and the three new wells that were installed in 1996 were to be designated after the first round of sampling. During the first five-year site review (August 1998) six monitoring wells (SHL-3, SHL-9, SHL-9, SHL-22, SHL-93-10C, and SHL-93-22C) achieved cleanup levels for all chemicals of concern and were reclassified as Group 1 wells. All other wells, including the three new wells, are classified as Group 2 wells. Well designations will be reviewed again during the second five-year review.

Of the chemicals of concern established in the Record of Decision, only those chemicals which present a carcinogenic risk were considered trigger chemicals in the Long Term Monitoring and Maintenance Plan. The trigger chemicals are arsenic, dichlorobenzenes, and 1,2-dichloroethane. Therefore, the evaluation of effectiveness of Alternative SHL-2 is based on the reduction of carcinogenic risk, rather than reduction of chemical concentrations, as a measure of progress toward attainment of cleanup goals. This approach prevents a situation in which failure to attain a concentration reduction goal for a minor contributor to risk (i.e. 1,2-dichloroethane) overshadows the achievement of a 50-percent reduction of concentration of a higher carcinogenic risk (arsenic). Risk reduction was evaluated during the first five-year review in August 1998. However, for annual reports, contaminant concentrations will be referenced against the cleanup levels as a benchmark. It should be noted that the majority of the risk present at Shepley's Hill Landfill is due to arsenic in the groundwater.

Arsenic was the only trigger chemical detected above cleanup levels during the 2000 sampling events. Analytical results from the 2000 groundwater sampling events (Tables 7-2 and 7-3) have indicated the presence of arsenic above the cleanup level in wells SHM-96-5B, SHM-96-22B, SHL-11, SHL-20, SHL-19, SHL-4 and SHM-96-5C. The 2000 monitoring year results were compared to previous year's data. A comparison of arsenic concentrations found during the year of 2000 with historical data indicates that there has been a general decrease in arsenic concentrations, except for at wells SHM-96-5B, SHL-11, SHL-22 and SHM-96-22B.

The first five-year review to assess the protectiveness of the selected remedial action for Shepley's Hill Landfill was completed in 1998, in accordance with the Record of Decision. The review concluded that reductions of contaminant concentrations and corresponding risk satisfied the evaluation criteria at most, but not all, historical groundwater monitoring wells. However, data from monitoring well SHM-96-5B, at the north end of the landfill, showed arsenic concentrations up to two orders of magnitude greater than historical values in other wells. Therefore, supplemental groundwater investigations were performed by the Army to assess whether arsenic contamination exists beyond the Devens Reserve Forces Training Area boundary, and to characterize its nature and location. In accordance with the *Final Work Plan, Supplemental Groundwater Investigation at Shepley's Hill Landfill, Devens Reserve Forces Training Area, Devens, Massachusetts* (HLA, February 1999) the work included: a hydrogeologic assessment of groundwater recharge potential along the western edge of the landfill, characterization of groundwater flow and quality immediately north of Shepley's Hill Landfill, updating and refining the groundwater model for Shepley's Hill Landfill, and analyzing rock samples for naturally occurring arsenic. This work is ongoing and a report will follow.

The 2000 landfill inspection identified additional corrective actions required to maintain the landfill cap. These include: regrade and reseed/riprap eroded areas; clear unwanted vegetation in drainage channels; remove trees from landfill cap; place stone aprons around gas vents; repair and regrade catch basins; repair the perimeter fence and conduct a topographic survey of the landfill to determine extent of settling and potential improvements in surface drainage. Corrective actions for landfill cap maintenance will be conducted within the next year. Overall the landfill is in fair condition and is functioning adequately.

The next round of groundwater sampling will be conducted in May 2001.

1.0 INTRODUCTION

This annual report has been prepared to document the monitoring and maintenance procedures conducted at the Shepley's Hill Landfill in Devens, Massachusetts based on the Record of Decision (ROD) (ABB-ES Oct 1995) for Shepley's Hill Landfill Areas of Contamination 4, 5, and 18. This report was developed by the U.S. Army Corps of Engineers (USACE), New England District (NAE).

The Long Term Monitoring and Maintenance Plan (LTMMP) (SWEC, May 1996) for Shepley's Hill Landfill outlines the landfill closure monitoring and maintenance procedures. These procedures include a semi-annual groundwater sampling program to monitor contaminants, and an annual visual inspection and gas emission monitoring of the landfill cap. This report documents the fifth year of the long term monitoring. The first two years of monitoring were conducted by Stone & Webster Environmental Technology & Services (SWEC). From 1998 through 2000, monitoring has been conducted by NAE. Post closure monitoring is required for a period of thirty years.

2.0 LANDFILL CAP MAINTENANCE ACTIVITIES

The Record of Decision for the Shepley's Hill Landfill required monitoring and maintenance of the landfill cap based on observations made during the annual inspections. Based on recommendations made from the 1996 and 1997 inspections, improvements and repairs were performed during 1998 to properly maintain the cap, as previously reported. The only maintenance activities performed during 1999 and 2000 include mowing of the landfill vegetative cover and drainage swales. There were no other cap maintenance improvements or repairs performed during these two years. The recommended maintenance items listed in the previous annual report did not pose an immediate risk to the integrity of the landfill cap, and are considered non-critical maintenance procedures. For cost effectiveness purposes, maintenance activities of this non-critical nature will be conducted approximately every two years, as warranted. In the event that repair needs are identified which would prevent immediate damage to the cap, they will be conducted expeditiously.

3.0 LANDFILL CAP MONITORING ACTIVITIES

The Shepley's Hill Landfill at Devens, Massachusetts was inspected on 30 October 2000 and 1 November 2000 by personnel from the U.S. Army Corps of Engineers (USACE), New England District (NAE). Features of the landfill inspected included the cap, the drainage system, the gas vent system, access roads, and the security fence. Observations were made regarding the vegetative cover, vegetation types, erosion, settlement, and general condition of the various features. Appendix A of this report contains the Landfill Maintenance Checklist that summarizes the findings of this inspection. All observations are also presented on Figure 3-1 (see plan pocket). A narrative of the findings of this inspection follows. Descriptions of observations begin at the northern extremity of the landfill and continue in a counter-clockwise direction.

- The northern half of the cap has many areas of standing water. A topographic survey of the landfill will have to be conducted in the near future and compared to the as-built topography to determine settlement areas. In conjunction with the existing drainage system, the topo and settlement findings will be the basis of corrective action for the extensive areas of standing water.
- On the west side near gas vent #9, a shallow sloped area is undergoing mild erosion. Vegetation
 is not well established and minor erosion is forming shallow gullies. The placement of topsoil
 and seed, with a surface treatment of broadcast hay or straw, should be sufficient to repair this
 area and stop the erosion process.
- Catch Basin #3 near the Cooke Street entrance to the site is not set at grade. Soil excavation in this area has left the rim of the grate about six to eight inches higher than the surrounding ground. This rim of this catch basin should be lowered to the surrounding grade.
- Catch basin #7 near the southwest corner of the site is substantially overgrown by the adjacent vegetation and will soon be completely overgrown and hidden from view. The catch basin is partially filled with many small pieces of PVC pipe. This catch basin should be cleared of encroaching vegetation and the PVC pipe pieces should be removed.
- The concrete headwall drainage structure at the terminus of the catch basin and underground conduit system on the south side is overgrown with vegetation, including some larger woody species, and is silting in. The grade of the channel bottom is uneven and standing water is present. Wetland species are becoming established as well. The structure and channel immediately downstream should be cleared, accumulated sediment should be removed, and the channel should be regraded as required to properly drain. The channel should then be reseeded or riprap should be placed, depending on water velocities.
- Most of the drainage swale on the south side is being invaded by wetland species. There are
 also intermittent zones of standing water indicating a lack of proper channel slope and drainage.
 The south side drainage swale should be cleared of wetland vegetation and regraded as needed
 to properly drain all areas of standing water. Depending on water velocities, the channel should
 then be reseeded or riprap should be placed.

- In the east side drainage swale, in the vicinity of gas vent #13 and continuing downstream to the new rock-lined channel, the drainage swale is overgrown with woody vegetation and wetland species. It appears to be silted in and has a large area of standing water. This reach of the drainage swale should be cleared of all vegetation and accumulated silt and sand, and regraded to drain properly. Seeding, or riprap placement, should follow, depending on water velocities.
- The eastern drainage swale has some minor vegetation growth and sand accumulation. The swale should be cleared.
- To the north of the gas vent #13 are several small trees. The trees should be removed and the area reseeded as necessary.
- The area in the vicinity of gas vent #12 is low and poorly graded. This is a large area, extending toward gas vents #14, #15, #16 and the access road. The area is often too wet to mow and is subject to encroachment of woody plants and wetland species. The area is very rutted due to vehicular traffic on the cap. The area should be surveyed, regraded and a drainage swale should be placed to convey water to the existing drainage swale to the east.
- In the vicinity of the new rock channel on the east side, there are large areas with sparse vegetation. The soil in the bare areas is mostly sand and is eroded to a depth of 12 inches in some areas. During the fall of 1998, hydroseeding of some of these barren areas was performed, but very little germination has occurred. The area should be graded to fill in the eroded areas and topsoil should be placed to a depth of 6 inches over the sand to allow grass to grow.
- To the east of gas vents # 11 and # 8 is a small stand of trees. These trees should be removed from the cap.
- To the east of gas vents # 11 and # 8 on the west bank of the swale is an area that is eroded to a depth of approximately 12 inches. This area should be reseeded, with hay or straw placed on the surface, to prevent further erosion.
- To the east of gas vents # 8 and # 5 on the hill above Plow Shop Pond is an area that is eroded to a depth of approximately 6 inches. This area should be reseeded, with hay or straw placed on the surface, to prevent further erosion.
- The access roads on the site are in good condition. Work was performed on these roads in the Fall of 1998 to upgrade the surface. There are no problems on access roads that warrant repair at this time.
- Portions of the perimeter chain-link security fence are in poor condition. Fence sections and gates are missing and unrestricted access to the site is available at several locations. Some evidence of off-road vehicles (ATV's, dirt bikes, etc.) using the cap area was seen. The security fence should be repaired, with all missing fence sections, including gates, replaced or repaired.

• The gas vents are in good condition. All screens and pipes are in functional condition and no repairs are required at this time. A stone apron should be placed around the vents to prevent future burrowing from animals.

A summary of Corrective Action measures for the Landfill Cap is included in Section 9.0.

The purpose of the landfill gas monitoring program is to establish long-term trends with regard to gas production and venting. A combustible gas survey was performed to determine whether methane, hydrogen sulfide, or volatile organic compounds have accumulated in the subsurface of the landfill site.

The fifth annual landfill gas sampling was conducted on 30 October and 1 November 2000. The weather on 30 October was overcast and rainy, with temperatures in the 40's (F) and the barometric pressure was 754 mm of mercury and rising. The weather on 1 November 20000 was sunny, with temperatures in the 50s (F), and the barometric pressure was 759 mm of mercury and falling. Gas samples were field analyzed for the following parameters using the listed equipment:

Parameter	Equipment							
Total Volatile Organic Compounds (VOC)	HNu Photoionization Detector (PID) with a 10.6 eV lamp							
Percent Oxygen	Industrial Scientific TMX 412 Combustible Gas Indicator (CGI)							
Hydrogen Sulfide (ppm)	CGI							
Percent Lower Explosive Limit (LEL)	CGI							
Carbon Monoxide (ppm)	CGI							
Percent Carbon Dioxide	Landtec Gem 500, GA-90 landfill gas monitor							
Percent Methane	Landtec Gem 500, GA-90 landfill gas monitor							

The CGI and the Landtec GA-90 were both calibrated in the shop by U.S. Environmental. The PID was calibrated in the field to 248 ppm isobutylene and 0 ppm.

Samples were collected by attaching a rubber Quik cap with a hose clamp to the gas vent pipe. A barbed fitting was placed in a drilled hole in the cap. Tubing was run from the barbed fitting to a MSA LC pump. The pump was operated for approximately 7 to 10 minutes to purge 2 vent pipe volumes and to ensure that the gases collected were representative of the gas collection layer. The gas monitoring equipment was then attached to the MSA pump and turned on. The readings were recorded on the Landfill Gas Monitoring form (Appendix B) after they had stabilized. The locations of the gas vents are shown in Figures 3-1 and 4-1.

This year the sampling round was conducted over a two day period. The readings recorded, although from different vents, were generally higher on the second day of sampling. The dissimilar results can be attributed generally to changes in barometric pressure, although the vents sampled on the second day generally exhibit higher readings historically. On 30 October the barometric pressure was rising and on 1 November the barometric pressure was dropping.

The results from both days of sampling can be found on Table 1 in Appendix B. The following is a brief summary of the results. VOCs were detected in V-16 (30 ppm) and V-17 (40 ppm). No other gas vent wells tested positive for VOC's . The oxygen levels ranged from 21.0% (Vent # 2) to 0% (Vent # 14) using the GA-90. No gas vent wells tested positive for hydrogen sulfide, reading 0 for all wells. LEL readings ranged from 0% in many of the wells to over 100% LEL in Vent Nos. 13, 14, 15, 17, and 18. Carbon monoxide registered 0 in all gas vent wells. Carbon dioxide ranged from 29.2 ppm (Vent # 17) to 0.1 ppm (Vents # 8, #11). Methane ranged from 41.0 ppm (Vent # 14) to 0 ppm in many of the wells sampled on 30 October. There was a gaseous odor at nearly all the vent wells sampled on 1 November.

The gas readings are within the parameters of a mature landfill. The vents are functioning properly. The scenario of high atmospheric pressure to low atmospheric pressure results in a venting of landfill gas into the atmosphere. This was the case on 1 November. The scenario of low atmospheric pressure to high atmospheric pressure results in air intrusion into the upper portion of the landfill. This would account for the lower gas readings on 30 October. The major concern with landfill gas is off-site migration. If the gas vents are functioning properly and are adequately spaced there should be no off-site migration of landfill gases; however, due to the high LEL readings and the proximity of residential housing and commercial development, gas monitoring probes should be installed along the property line where the landfill is adjacent to structures.

.

5.0 GROUNDWATER ELEVATIONS

Groundwater elevations were collected from each well during groundwater sampling activities. The depth to groundwater was subtracted from the elevation of the reference point to determine the elevation of the groundwater at each location. Table 5-1 lists the water level elevations for each well for each sampling round. Also indicated on that table is the screened interval for each well, indicating where the surrounding groundwater interfaces with each well. Figure 5-1 shows a cross-section of the wells in the monitored area that has generally shown the highest levels of chemicals of concern. During each sampling event, groundwater elevations were recorded on the first day of sampling for all wells scheduled to be sampled. Groundwater levels measured during May 2000 were consistently higher than those measured in October 2000. This is most likely due to the above average precipitation the area experienced for early spring, and below average summer and fall precipitation. The mean drop in groundwater elevation (from spring to fall reading) was 1.7-feet, and ranged from 0.6 to 3.3-feet. Compared to the year before, spring 2000 levels were consistently higher than spring 1999, and fall 2000 levels were lower than fall 1999 levels. This follows since more of the area's 1999 precipitation fell in the later months of the year.

In addition to these semi-annual groundwater measurements, regular groundwater measurements of all Shepley's Hill Landfill wells have been conducted by Harding ESE (formerly ABB-ES and HLA) since 1992. During the first 5-year review (SWEC, August 1998), groundwater elevations were re-evaluated to identify hydraulic gradients and to confirm changes due to the construction of the landfill cap. It was determined that the landfill cap has reduced the volume of water beneath the cap, resulting in a more northerly groundwater flow (SWEC, 1998). Groundwater flow patterns will be re-evaluated during the next 5-year review.

In light of data collected for the first Five-Year Review performed in accordance with the Record of Decision for the Shepley's Hill Landfill Operable Unit, Harding ESE continues to perform supplemental groundwater investigations which include, in part, a hydrogeologic assessment to obtain additional data to evaluate the effectiveness of the selected remedial action.

		Groundwater Elevations (Ft NGVI					
Well Identification	Screened Interval	May 8, 2000	October 30, 2000				
SHL-3	213.4-223.4	218.68	217.66				
SHL-4	213.0-223.0	218.42	217.79				
SHL-5	203.4-213.4	216.77	213.48				
SHM-96-5B	128.5-138.5	215.42	213.20				
SHM-96-5C	158.5-168.5	215.41	213.19				
SHL-9	197.8-207.8	215.25	212.91				
SHL-10	211.2*-231.0	218.51	217.30				
SHM-93-10C	192.7-202.7	219.14	218.10				
SHL-11	206.5-221.5	217.85	217.26				
SHL-19	209.3-224.3	218.93	217.67				
SHL-20	185.8-195.8	217.98	217.36				
SHL-22	104.5-114.5	215.23	212.93				
SHM-96-22B	127.6-157.6	215.18	212.91				
SHM-93-22C	87.3-97.3	215.25	212.94				

TABLE 5-1 Monitoring Wells and Elevations

* Previous records show well SHL-10 having a bottom elevation of 207.0 NGVD. Recent field observations have revealed that refusal is met at 211.2 NGVD.



6.0 GROUNDWATER SAMPLING

Groundwater sampling activities at the landfill are conducted semi-annually. Groundwater sampling activities for the fifth year were conducted in the spring (May 8, 9 and 11, 2000) and in the fall (October 30, November 1 - 2, 2000). Precipitation events delayed sampling on May 10 and October 31, 2000. Wells are designated as either Group 1 or Group 2 wells. Wells which have historically attained cleanup goals are given a Group 1 designation. Wells which have not historically attained cleanup goals are designated as Group 2 wells. Initially, all existing wells were designated as Group 2 wells and the three new wells that were installed in 1996 were to be designated during the first five-year site review (SWEC, August 1998). During the first five-year site review, six wells (SHL-3, SHL-5, SHL-9, SHL-92, SHL-93-10C, and SHL-93-22C) achieved cleanup levels for all chemicals of concern and were reclassified as Group 1 wells. All other wells, including the three new wells, were classified as Group 2 wells. These group designations are presented in Table 6-1, located at the end of this section. Well designations will be reviewed again during the second five-year review.

6.1 Preparation for Sampling

Wells sampled as part of the long term monitoring program included SHL-3, SHL-4, SHL-5, SHL-9, SHL-10, SHL-11, SHL-19, SHL-20, SHL-22, SHM-93-10C, SHM-93-22C, SHM-96-22B, SHM-96-5B, and SHM-96-5C. Locations of the wells are shown on Figures 4-1 and 6-1. Sampling activities were coordinated with the Devens BRAC office and the contract laboratory prior to commencement of sampling. The contract laboratory was contacted approximately three weeks prior to sampling and was requested to prepare and deliver sampling bottles, quality assurance bottles and coolers to New England District approximately one week prior to the sampling event. Bottles were checked to insure that they complied with the requirements of the sampling program. Sampling equipment (including the YSI water quality meters and the teflon lined tubing) was reserved for rental/purchase from U.S. Environmental and picked up in the days preceding the sampling event. NAE used their own Grunfos Rediflow II pumps, controllers, Heron water level indicators, HF Scientific DRT-15CE turbidity meters, and portable generator for the sampling. All equipment was inventoried and tested to ensure it was accounted for and functioning. The well logs of each of the wells to be sampled were reviewed by the field team prior to the scheduled event to determine tubing requirements, and brought to the landfill during the sampling event to confirm the screened intervals.

6.2 Sampling

The fifth year of sampling was conducted by NAE on May 8, 9 and 11, 2000 and later on October 30, November 1 - 2, 2000. Monitoring wells were purged and sampled in accordance with *EPA's Low* Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells (July 1996) using an adjustable rate, low flow submersible pump. Teflon lined tubing was used for sample collection and was disposed after each well was sampled.

Before sampling activities commenced, groundwater elevations were measured at each well location to be sampled. YSI water quality meters and turbidity meters were calibrated at the beginning of each day of use. A calibration check was also performed at the end of each day. During sampling, the generator used to power the pumps was located at a downwind area at least 30 feet away from the well being sampled, to minimize potential contamination from the exhaust. Upon initial opening of each well, initial water level measurements were collected. The pump intake was lowered to the middle of the screen of each well to be sampled when possible. When the water level was below the top of the screen, the pump was positioned to a depth between the top of the water level and the bottom of the screen.

Once the pumping was initiated, at least one volume greater than the stabilized drawdown volume plus the extraction tubing volume was purged. Water quality parameters, including temperature (temp), specific conductance, pH, oxidation reduction potential (ORP), turbidity, and dissolved oxygen (DO) were collected every 3 to 5 minutes to ensure proper purging of the wells before each well was sampled. The results are listed on Groundwater Field Analysis Forms located in Appendix C. All water quality parameters, except turbidity, were monitored using a flow-thru cell and a Sonde-YSI water meter (YSI 600 XLM). Turbidity samples were not collected from the flow through cell due to the silt buildup which can occur in the cell. A Y-connector was set up before the flow through cell to take the turbidity readings. Sampling was conducted when required purge volumes were met and water quality parameters became stabilized for three consecutive readings. The tubing was disconnected from the flow-through cell and samples were collected directly from the discharge tubing. Observations made during the sampling activities include:

- To ensure precision of water level measurements, well casings that had faded marks or no marks were remarked.
- None of the pre-preserved sample bottles required pH adjustments after they were filled with the water samples.
- In cases where the water level was lower than the top of the screen, the pumps were lowered to approximately midpoint between the water level and the bottom of the screen. This procedure occurred at several wells during each event.
- Well SHL-3 is developing a history of difficulty when attempts to stabilize the sample stream are made. Further investigation of the cause will be made in 2001, but it is believed that material within the well may be blocking flow through the pump. Symptoms include purge rates that diminish within a few minutes consistently, while no considerable drawdown of the water surface is noted. Since the requirements of the sampling procedure can not be met (parameter stabilization), results for this well may be suspect.
- During the spring 2000 sampling event, the pH detector on one of the two water meters in use ceased to function. As a result pH readings are not available for the spring 2000 sampling of wells SHL-11 and SHL-19. Review of pH readings taken with this meter, prior to the problem being discovered, shows that the last well monitored (SHL-10) had uncharacteristically low pH readings. Therefore, these readings should be disregarded. When the meter was checked using calibration standards at the end of the day, readings indicated that the pH probe was not functioning properly anymore. Records show that the meter was apparently functioning fine until it was used at well SHL-10, which was

the last well of the day where that meter was in service. After the problem was confirmed the next day, the probe was replaced. The USACE data from spring 1998 through fall 2000 shows that this well has normally stabilized at a pH of 6.8 to 7.1 (while the questionable data from the spring of 2000 stabilized at 4.6).

6.3 Equipment Decontamination

All non-disposable sampling and testing equipment that came in contact with the sampling medium was decontaminated to prevent cross contamination between sampling points. The submersible pump was decontaminated using the following procedure:

- Upon removal of the pump from the well following sample collection, the pump was submersed in a 4-inch PVC riser containing potable water and detergent (Alconox) solution. At least 1 to 2 gallons of the detergent solution was pumped through (started the pump at a low flow rate, as in sampling, and increased to a higher speed).
- The pump was removed and sprayed with potable water to minimize the transfer of soap to the rinser.
- The pump was then submersed in a riser filled with potable water and at least 1 to 2 gallons were pumped through.
- The pump was then submersed in a riser filled with deionized water and at least 1 to 2 gallons were pumped through.
- The submersible pump was sprayed with isopropyl alcohol (reagent grade) using a hand held spray bottle, over a tub. The pump was then submersed in a final deionized water rinse and at least 1 to 2 gallons were pumped through.
- The pump was air dried and wrapped in clean aluminum foil.

Monitoring Well Identification	Well Designation (Based on Final Five Year Review, SWEC, Aug 1998)
SHL-3	Group 1
SHL-4	Group 2
SHL-5	Group 1
SHL-9	Group 1
SHL-10	Group 2
SHM-93-10C	Group 1
SHL-11	Group 2
SHL-19	Group 2
SHL-20	Group 2
SHL-22	Group 1
SHM-93-22C	Group 1
SHM-96-22B	Group 2
SHM-96-5B	Group 2
SHM-96-5C	Group 2

TABLE 6-1 Monitoring Well Designations



7.0 LABORATORY TESTING

Groundwater was sampled in fourteen monitoring well locations using the low-flow method in accordance with the procedures outlined in the approved Long Term Monitoring and Maintenance Plan, Shepley's Hill Landfill (SWEC, May 1996). Samples were sent to Severn Trent Laboratories (formerly Intertek Testing Services Environmental Laboratories) in Colchester, Vermont for analysis. The samples were collected on May 8, 9, 11 and later on October 30 and November 1, 2, 2000. Samples were placed in containers compatible with the intended analysis and properly preserved prior to shipment to the laboratory. Each sealed container was placed in a leakproof plastic bag and placed in a strong thermal ice chest (cooler) filled with bubble wrap packing material, or equivalent, to ensure sample integrity during shipment. Ice was added to cool samples to no more than 4° C. Chains of Custody (COCs) were used to identify and document the samples being shipped (copies are included in Appendix D). Sample custody was initiated by the sampling team upon collection of samples and COC forms were placed in waterproof plastic bags and taped to the inside lid of the cooler. The cooler was sealed with chain-of-custody seals and shipped to the laboratory via overnight delivery.

7.1 Analyses

Water analyses were conducted according to EPA methods 8260B for volatile organics, 6010B/7470A for TAL metals, and as follows for general chemistry analyses, including chemical oxygen demand by method 410.1, biochemical oxygen demand by method 405.1, hardness by method 130.2, alkalinity by method 310.1, cyanide by method 9010, anions by method 300.0, total dissolved solids by method 160.1, and total suspended solids by method 160.2. These analyses were conducted at all wells. Table 7-1 indicates the analysis and procedures used for groundwater samples collected at Shepley's Hill Landfill.

7.2 Results

The approach for evaluating the effectiveness of the remedy is presented in the Record of Decision (ABB-ES, 1995). Of the chemicals of concern identified in the ROD, only those chemicals which present carcinogenic risk were considered trigger chemicals in the Long Term Monitoring and Maintenance Plan (SWEC, May 1996). The trigger chemicals are arsenic, dichlorobenzenes, and 1,2-dichloroethane. Therefore, the evaluation of effectiveness of Alternative SHL-2 is based on the reduction of carcinogenic risk, rather than reduction of contamination, as a measure of progress toward attainment of cleanup. This approach prevents a situation in which failure to attain a concentration reduction goal for a minor contributor to risk (i.e., 1,2-dichloroethane) overshadows the achievement of a 50 percent reduction of concentration of a higher carcinogenic risk (arsenic). Risk reduction was evaluated during the first five-year review in August 1998. However, for the annual reports the contaminant concentrations will be referenced against the cleanup levels as a benchmark. It should be noted that the majority of the risk present at Shepley's Hill landfill is due to arsenic in the groundwater.

Arsenic was the only trigger chemical detected above cleanup levels at the site during the 2000 sampling events. Analytical results for groundwater analyses are presented in Tables 7-2 and 7-3, for the spring and fall rounds, respectively.

PARAMETERS	METHOD
Volatile Organic Compounds	
Xylenes Acetone 2-Butanone 2-Methyl-2-Pentanone Benzene Methyl-t-Butyl Ether 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene	USEPA 8260B
Inorganics Aluminum Arsenic Barium Cadmium Chromium Copper Cyanide (wet chemistry) Iron Lead Manganese Mercury Nickel Selenium Sodium Silver Zinc	USEPA 6010B except Cyanide by USEPA 9010 and Mercury by USEPA 7470A
General Parameters (laboratory determination) Hardness Total Dissolved Solids Total Suspended Solids Chloride Nitrate as N Sulfate Alkalinity Biochemical Oxygen Demand – 5 day Chemical Oxygen Demand	USEPA 130.2 USEPA 160.1 USEPA 160.2 USEPA 300.0 USEPA 300.0 USEPA 300.0 USEPA 310.1 USEPA 405.1 USEPA 410.1
General Parameters (field determination) pH Temperature Specific Conductance Dissolved Oxygen Oxygen Reduction Potential Turbidity	

TABLE 7-1 Groundwater Sample Analysis and Procedures

USEPA - U.S. Environmental Protection Agency

TABLE 7-2 Groundwater Analytical Results - May 8, 9 & 11, 2000 Sampling Event Shepley's Hill Landfill Devens, Massachusetts (SHEET 1 of 1)

The state of the state of the state	Well No.	SHL-3	SHL-4	SHL-5	SHM-96-5B	SHM-96-5B DUP	SHM-96-5C	SHL-9	SHL-10	10 SHM-93-10C	SHL-11	SHL-19	SHL-20	SHL-22	SHM-96-22B	SHM-93-22C
PARAMETERS	CLEANUP	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
1	LEVEL (1)												1	1		
	ug/L	1.1	1	1		1		1			1	-			1	
VOLATILES (8260)		1				1		1.0.0		1	111					
Xvienes	10,000 (2)	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Acetone	3.000 (4)	<5.0	<5.0	<5.0	<5.0	<5.0	5.6	<5.0	<5.0	<5.0	<5.0	<5.0	4.1.1	<5.0	<5.0	<5.0
2-Butanone		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
4-Methyl-2-Pentanone		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Benzene	5 (2)	<5.0	<5.0	<5.0	1.3 J	1.4 J	1.4 J	<5.0	<5.0	<5.0	1.9 J	<5.0	<5.0	<5.0	1.8 J	<5.0
Methyl-t-Butyl Ether	70 (4)	<5.0	<5.0	<5.0	1.2.1	121	1.5.1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	1.7.1	1.3.1	10.1
1.1-Dichloroethane	70 (4)	<5.0	<5.0	<5.0	241	23.1	24.1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	26.1	27.1	20.1
1.2-Dichloroethene (total)	70 (2)	<5.0	<5.0	<5.0	331	331	2.7 J	<5.0	<5.0	<5.0	1.5 J	<5.0	16.1	29.1	33.	141
1.2-Dichloroethane	5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1.3-Dichlorobenzene	600 (2)	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1.4-Dichlorobenzene	5	<5.0	<5.0	<5.0	16.1	16.1	<5.0	<5.0	<5.0	<5.0	18.1	<5.0	39.1	<5.0	<5.0	<5.0
1.2-Dichlorobenzene	600	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	-	1		1										1.1.0		
METALS (6010)		1.0.00							1		1					
Arsenic	50	<2.5	116	<2.5	5,110	5,040	52.2	15.0	<2.5	5.9 J	404	41.4	216	14.6	1.360	34.4
Barium	2.000 (2)	<10.7 N	34.7 JN	<10.7 N	67.5 JN	65.2 JN	55.8 JN	12.9 JN	<10.7 N	<10.7 N	116 JN	<10.7 N	111 JN	12.2 JN	97.9 JN	75 1 JN
Cadmium	5(2)	<0.30	< 0.30	<0.30	<0.30	<0.30	<0.30	0.33 J	<0.30	0.35 J	< 0.30	<0.30	<0.30	0.33 J	<0.30	0.34.1
Chromium	100	10.2	2.6 J	3.6 J	4.0 J	2.5 J	4.2 J	35J	6.7 J	4.0 J	3.3.J	2.6 J	4.0.1	3.3.1	31J	4.2.1
Copper	1,300 (3)	27.7 N	2.9 JN	4.7 JN	12.8 JN	5.8 JN	9.5 JN	4.4 JN	17.2 JN	4.4 JN	4.6 JN	12.1 JN	4.6 JN	4.9 JN	7.1 JN	9.0.IN
Iron	9,100	648	9,400	2,130	45,000	44,400	67,000	3,620	176	91.1 J	71,300	6,110	10,500	396	96.800	437
Lead	15	24 J*	2.8 J*	4.4*	2.7 .1*	3.3*	3.1 *	<2.3*	<2.3*	<2.3*	<2.3*	<2.3*	<2.3*	<2.3*	34*	27.1
Manganese	1,715	17.4	826	506	11,200	11,100	4,460	482	7.1 J	40.6	3.220	925	8,640	830	2.290	586
Mercury (7470A)	2(2)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nickel	100	4.8 J	<2.9	<2.9	17.5 J	16.2 J	4.6 J	<2.9	<2.9	<2.9	11.7 J	<2.9	14.7 J	7.4.1	6.7.1	<29
Selenium	50 (2)	<4.0	<4.0	<4.0	<4.0	4.8 J	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Silver	40 (4)	3.8 J	4.6 J	5.1 J	6.4 J	4.7 J	7.8 J	5.2 J	5.0 J	6.3 J	5.8 J	42J	5.0 J	4.6 J	5.6 J	481
Zinc	2,000 (4)	15.2 J	3.2 J	6.9 J	3.6.1	2.6 J	2.3 J	45J	211	2.8 J	1.7 J	3.0 J	2.9 J	15.4 J	321	7.4.1
Aluminum	6,870	535	49.9 J	400	73.3 J	49.4 J	63.7 J	119 J	231	142 J	48.8 J	54.2 J	50.4 J	41.3 J	33.9 J	69.1 J
Sodium	20,000	692 J	3,460 J	1,950 J	45,700	44,500	35,300	1.300 J	617 J	8,040	40,400	981 J	48,400	51,700	45,000	23,700
GENERAL CHEMISTRY																
Alkalinity		3 000 *	47 000 *	33.000 *	400.000 *	316 000 *	296.000 *	48.000 *	9.000 *	102 000 *	232 000 *	21 000 *	344 000 *	426 000 *	240.000 *	052 000 1
Biochomical Owner Daman		c2 000	<2,000	<2,000	<2,000	<2 000	230,000	40,000	5,000	192,000	232,000	21,000	344,000	435,000	340,000	252,000
Chlorida		1 200 *	6 900 *	1 200 *	52 500 *	52,000 *	50 600 *	4 200 *	1.600.*	30,500 *	50 100 *	2,000	50 200 *	\$2,000	C1 100 *	2,200
Chamical Ownen Demand		<5 000	<5.000	20,000	20.000	18 000	24,000	12 000	<5.000	6,000	34,000	2,100	55,000	61,000	35.000	44,000
Cvanide (Total)	200 (2)	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Hardness	200 [2]	8 000	54,000	32 000	330.000	330.000	330.000	62,000	13 000	226.000	192 000	24.000	72 000	440.000	270.000	300 000
Nitrate as Nitrogen	10.000 (2)	300	300	<200	<200	<200	<200	<200	400	<200	<200	500	<200	<200	<200	300
Sulfate	500 000 (2)	3 400 N	9 900 N	2 000 M	- 5 200 N	5 200 N	4 400 N	10 500 M	3 900 M	22 700 N	4 400 N	7 200 M	8 500 M	5 200 N	4 400 M	18 000 M
Total Dissolved Solids	200,000 (2)	32 000	71,000	68 000	473 000	474 000	401.000	78.000	59.000	299 000	344 000	36.000	507.000	577 000	460,000	385.000
Total Suspended Solids		3 100	4,900	2 000 B	54,200	52 700	67 800	3 400	19,800	12,900	36 700	7 600	13 200	2300 8	008.00	5 100
Notes:	-	01100	1.1000	1 4,000 0	0.11200		01,000		101000	12,000		1,1000	TOLLOU	1 6,000 D	00,000	5.100

Shaded areas with bold numbers indicate cleanup level exceedance. -

B = Value within 5 times of the amount detected in the equipment blank sample

25

J = Value below the Contract Required Detection Limit or Practical Quantitation Limit

N = Matrix spike sample recovery outside acceptance limits

* = Duplicate analysis Relative Percent Difference outside acceptance limits

(1) Cleanup values as developed in the ROD (unless otherwised noted)

(2) No cleanup value was developed so the Federal Maximum Contamination Level was used

(3) No cleanup value was developed so the Massachusetts Maximum Contamination Level was used

(4) No cleanup value was developed so the Massachusetts Contingency Plan GW-1 standard was used

TABLE 7-3 Groundwater Analytical Results - Oct 30, Nov 1-2, 2000 Sampling Event Shepley's Hill Landfill Devens, Massachusetts (SHEET 1 of 1)

Concernance of the second	Well No.	SHL-3	SHL-4	SHL-5	SHM-96-58	SHM-96-5B DUP	SHM-96-5C	SHL-9	SHL-10	SHM-93-10C	SHL-11	SHL-19	SHL-20	SHL-22	SHM-96-22B	SHM-93-22C
PARAMETERS	CLEANUP	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
	LEVEL (1)				1		1					11.				1
	ug/L														1	-
VOLATILES (8260)					1		1									
Xylenes	10.000 (2)	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Acetone	3,000 (4)	3.2 J	<5.0	<5.0	<5.0	2.2 J	2.9 J	<5.0	<5.0	<5.0	2.5 J	<5.0	23J	<5.0	5.4	<5.0
2-Butanone		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
4-Methyl-2-Pentanone		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Benzene	5(2)	<5.0	1.7 J	<5.0	<5.0	<5.0	1.4 J	<5.0	<5.0	<5.0	1.9 J	<5.0	<5.0	< 5.0	1.5 J	<5.0
Methyl-t-Butyl Ether	70 (4)	<5.0	<5.0	<5.0	1.4 J	1.3.J	1.3 J	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	1,7 J	1.3 J	1.2 J
1.1-Dichloroethane	70 (4)	<5.0	<5.0	<5.0	2.3 J	2.2 J	1.8 J	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	2.3 J	241	1.9 J
1,2-Dichloroethene (total)	70 (2)	<5.0	2.9 J	<5.0	3.0 J	2.8 J	3.0 J	<5.0	<5.0	<5.0	1.9 J	<5.0	1.8 J	2.4 J	291	1.4 J
1,2-Dichloroethane	5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,3-Dichlorobenzene	600 (2)	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dichlorobenzene	5	<5.0	<5.0	<5.0	<5.0	1.3 J	<5.0	<5.0	<5.0	<5.0	2.3 J	<5.0	2.9 J	1.4 J	1.7 J	<5.0
1,2-Dichlorobenzene	600	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
METALS (6010)		1		1			-		1				1		1	
Arsenic	50	17.4 N	91.5 N	13.8 N	2,500 N	2,610 N	40.3 N	31.4 N	<4.2 N	8.8 N	523 N	154 N	172 N	45.0 N	1,180 N	47.8 N
Barium	2,000 (2)	10.5	107	9.7	48.9	51.0	58.7	16.8	5.0	6.6	112	23.6	109	13.2	80.4	80.9
Cadmium	5(2)	<0.30	< 0.30	< 0.30	<0.30	<0.30	<0.30	< 0.30	< 0.30	<0.30	< 0.30	<0.30	< 0.30	< 0.30	< 0.30	< 0.30
Chromium	100	1.3	1.0	1.3	<1.0	<1.0	<1.0	4.3	1.5	1.6	<1.0	<1.0	<1.0	1.1	<1.0	<1.0
Copper	1,300 (3)	5.4	<1.8	<1.8	<1.8	4.2	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Iron	9,100	5,250	14,800	5,100	25,100	25,300	55,100	10,600	50.3	98.3	88,000	29,300	10,600	905	71,600	870
Lead	15	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Manganese	1,715	530	1,110	720	12,800	12,900	5,520	564	<1.5	37.4	3,120	4,090	8,390	1,300	1,970	505
Mercury (7470A)	2 (2)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nickel	100	<3.4	16.2	4.9	15.6	16.4	6.6	3.7	3.8	6.4	4.4	8.8	15.8	9.5	8.0	<3.4
Selenium	50 (2)	<3.7 N	<3.7 N	<3.7 N	6.6 N	<3.7 N	<3.7 N	<3.7 N	<3.7 N	<3.7 N	4.5 N	3.8 N	4.0 N	<3.7 N	3.8 N	<3.7 N
Silver	40 (4)	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Zinc	2,000 (4)	<3.5	9.2	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	4.9	<3.5	11.9	<3.5	<3.5
Aluminum	6,870	196 *	229 *	279 *	12.4 J*	21.2 J*	34.1 *	130 *	14.7 *	28.4 *	76.8 *	20.8*	49.4 *	40.8 *	32.9 *	24.6 *
Sodium	20,000	16,300	20,600	3,690	40,200	42,400	37,800	2,380	974	8,250	36,300	3,350	43,500	48,000	58,100	23,600
GENERAL CHEMISTRY		1	1									1			-	
Alkalinity as CaCO3	12825	25,000	168,000	57,000	392,000	380,000	320,000	84,000	25,000	184,000	252,000	84,000	424,000	22,000	344,000	28,000
Biochemical Oxygen Deman	d -	<2,000	<2,000	<2,000	3,500	<2,000	<2.000	3,500	<2,000	<2,000	<2,000	<2,000	<2,000	<2.000	<2.000	<2,000
Chloride		1.400	31,600	1,400	55,700	52,700	57,200	4,000	1,200	31,700	49,000	3,200	57,600	69,000	55,700	48,700
Chemical Oxygen Demand		<5,000	36,000	14,000	8,000 J	20,000 J	66,000	14.000	<5	<5	20,000	<5	6,000	8,000	22,000	58,000
Cyanide (Total)	200 (2)	<10.0 N	<10.0 N	<10.0 N	<10.0 N	<10.0 N	<10.0 N	<10.0 N	<10.0 N	<10.0 N	<10.0 N	<10.0 N	<10.0 N	<10.0 N	<10.0 N	<10.0 N
Hardness as CaCO3	-	28,000	145,000	70,000	410,000	350,000	220,000	70,000	24,000	230,000	190,000	60,000	380,000	430.000	230,000	300.000
Nitrate as Nitrogen	10,000 (2)	600	300	<200	<200	<200	<200	<200	400	<200	<200	<200	<200	<200	200	<200
Sulfate	500,000 (2)	10,000	8,000	4,100	5,300	5,200	4,900	11,800	3,600	20,800	<0.2	15,800	9,100	3,900	3,400	15,700
Total Dissolved Solids		62,000	241,000	100,000	494,000	490,000	391,000	126,000	39,000	297,000	386,000	142,000	535,000	586,000	447.000	368,000
Total Suspended Solids		3,100	17,800	1.600 B	44,200	39,500	49,600	1,100 B	2.000 B	2,100 B	63,200	6,400	13,400	2,200 B	112,000	4,100

Notes:

Shaded areas with bold numbers indicate cleanup level exceedance. -

B = Value within 5 times of the amount detected in the equipment blank sample

25

J = Estimated Value

N= Matrix Spike sample recovery outside acceptance limits

* = Duplicate analysis Relative Percent Difference outside acceptance limits

(1) Cleanup values as developed in the ROD (unless otherwised noted)

(2) No cleanup value was developed so the Federal Maximum Contamination Level was used

(3) No cleanup value was developed so the Massachusetts Maximum Contamination Level was used

(4) No cleanup value was developed so the Massachusetts Contingency Plan GW-1 standard was used

N

This table presents detectable concentrations of chemical contaminants, or where concentrations were not detected the value is recorded as less than the detection limit. These results are compared against the applicable cleanup level or MCL if there is no established cleanup level. Results of wet chemistry analyses are also included in the table. The results of sampling are summarized below.

7.2.1 Results for Samples Collected Spring 2000

Volatile Organic Compounds (VOCs) were analyzed in the fourteen monitoring wells. None of the wells had detectable concentrations of VOCs above the established cleanup levels for any of the trigger chemicals (or any of the chemicals of concern). The only trigger VOC detected was 1,4-dichlorobenzene, which was found in monitoring wells SHM-96-5B (1.6 J μ g/L), SHL-11 (1.8 J μ g/L) and SHL-20 (3.9 J μ g/L). The trigger compounds 1,2-dichloroethane, 1,2-dichlorobenzene and 1,3-dichlorobenzene were not detected in any of the wells. Non-trigger VOCs detected at levels below MCLs in groundwater samples include acetone (5.6 μ g/L or less), benzene (1.9 J μ g/L or less), methyl-t-butyl ether (1.7 J μ g/L or less), 1,1-dichloroethane (2.7 J μ g/L or less), and total 1,2-dichloroethene (3.3 J μ g/L or less).

Of the identified chemicals of concern for metals, only arsenic was identified as a trigger chemical. Arsenic was detected at concentrations greater than the cleanup level of 50 μ g/L in the following monitoring wells: SHL-4 (116 μ g/L), SHM-96-5B (5,110 μ g/L), SHM-96-5C (52.2 μ g/L), SHL-11 (404 μ g/L), SHL-20 (216 μ g/L), and SHM-96-22B (1,360 μ g/L). A duplicate sample from well SHM-96-5B had a concentration of 5,040 μ g/L. The only other chemicals of concern (non-trigger) detected at concentrations above the cleanup levels were iron, manganese, and sodium. Iron was detected at levels above its cleanup level of 9,100 μ g /L at wells SHL-4, SHM-95-5B, SHM-96-5C, SHL-11, SHL-20, and SHM-96-52B, with the maximum detected (96,800 μ g/L) at well SHM-96-22B. Wells SHM-96-5B, SHM-96-5C, SHL-11, SHL-20, and SHM-96-5C, SHL-11, SHL-20, and SHM-96-5B. Sodium was detected at levels above its cleanup level of 1,715 μ g /L. The maximum value detected for manganese was 11,200 μ g /L at wells SHM-96-5B. SHM-96-5C, SHL-11, SHL-20, SHL-22, SHM-96-5B. SHM-96-5C, SHL-11, SHL-20, SHL-22, SHM-96-22B, and SHM-93-22C with the maximum detected (51,700 μ g/L) at well SHL-22.

7.2.2 Results for Samples Collected Fall 2000

Volatile Organic Compounds (VOCs) were analyzed in the fourteen monitoring wells. None of the wells had detectable concentrations of VOCs above the established cleanup levels for any of the trigger chemicals (or any of the chemicals of concern). The only trigger VOC detected was 1,4-dichlorobenzene, which was found in monitoring wells SHM-96-5B (1.3 J μ g/L), SHL-11 (2.3 J μ g/L), SHL-20 (2.9 J μ g/L), SHL-22 (1.4 J μ g/L), and SHM-96-22B (1.7 J μ g/L). The trigger compounds 1,2-dichlorobenzene and 1,3-dichlorobenzene were not detected in any of the wells. Non-trigger VOCs detected at levels below MCLs in groundwater samples include acetone (5.4 μ g/L or less), benzene (1.9 J μ g/L or less), methyl-t-butyl ether (1.7 J μ g/L or less), 1,1-dichloroethane (2.4 J μ g/L or less), and total 1,2-dichloroethene (3.0 J μ g/L or less).

Of the identified chemicals of concern for metals, only arsenic was identified as a trigger chemical. Arsenic was detected at concentrations greater than the cleanup level of 50 μ g/L in the following

monitoring wells: SHL-4 (91.5 N μ g/L), SHM-96-5B (2,500 N μ g/L), SHL-11 (523 N μ g/L), SHL-19 (154 N μ g/L), SHL-20 (172 N μ g/L), and SHM-96-22B (1,180 N μ g/L). A duplicate sample from well SHM-96-5B had a concentration of 2,610 N μ g/L. The only other chemicals of concern (non-trigger) detected at concentrations above the cleanup levels were iron, manganese, and sodium. Iron was detected at levels above its cleanup level of 9,100 μ g/L at wells SHL-4, SHM-95-5B, SHM-96-5C, SHL-9, SHL-11, SHL-19, SHL-20, and SHM-96-22B, with the maximum detected (88,000 μ g/L) at well SHL-11. Wells SHM-96-5B, SHM-96-5C, SHL-11, SHL-19, SHL-20, and SHM-96-22B had concentrations of manganese above the cleanup level of 1,715 μ g/L. The maximum value detected for manganese was 12,900 μ g/L at SHM-96-5B. Sodium was detected at levels above its cleanup level of 20,000 μ g/L at wells SHL-4, SHM-96-5B, SHM-96-5C, SHL-11, SHL-20, SHL-22, SHM-96-22B, and SHM-93-22C with the maximum detected (58,100 μ g/L) at well SHM-96-22B.

Tables 7-2 and 7-3 summarize the monitoring wells that had contaminant concentrations above the cleanup levels during the 2000 monitoring period. These values were compared to previous year's data. A comparison of arsenic concentrations detected above the cleanup levels during the 2000 period with historical data is presented in Table 7-4. The comparison indicates the following:

General decrease in arsenic concentrations except for at wells SHM-96-5B, SHL-11, SHL-22 and SHM-96-22B. Wells SHM-96-5C, SHL-9, and SHL-20 indicated no definitive change over historic values. It should be noted that 8 of the 14 wells were below the MCL cleanup level for the last round of sampling. The wells below the cleanup levels are wells SHL-3, SHL-5, SHM-96-5C, SHL-9, SHL-10, SHM-93-10C, SHL-22, and SHM-93-22C. Refer to Appendix E for a graphical comparison of arsenic concentrations in monitoring wells for the previous and current sampling periods.

	Arsenic (ug/L)													
Well ID	Aug-91	Dec-91	Mar-93	Jun-93	Nov-96	May-97	Oct-97	May-98	Nov-98	May-99	Nov-99	May-00	Nov-00	
		1	1	_										
SHL-3	35	120	6.5	NS	NS	<10	<10	<5	<5.4	2.7 B	<1.9	<2.5	17.4	
SHL-4	260	140	2.54	NS	48.8	73.6 J	180	37.4	89.1	78.2	61.3	116	91.5	
SHL-5	23	38	11.4	NS	12	<10	<10	<5	11.5	5.0 B	6.5	<2.5	13.8	
SHM-96-5B	NS	NS	NS	NS	1,440	3,300 J	2,040	4,300	3,080	3,490	2,700	5,110	2,500	
SHM-96-5C	NS	NS	NS	NS	71	43.2	43.1	49.5	46.8	57.0	44.8	52.2	40.3	
SHL-9	37	67	42.4	NS	46.9	16.1 J	25.2	15	27.2	71.3	28.5	15.0	31.4	
SHL-10	67	120	280	NS	3.4 B	<10	209	<5	<5.4	2.7 B	<1.9	<2.5	<4.2	
SHM-93-10C	NS	NS	21.3	18.1	12.4	<10	10.5	7.5	10.2	10.8 B	8.7	5.9 J	8.8	
SHL-11	320	320	340	NS	332	252 J	366	346	376	431	492	404	523	
SHL-19	340	710	390	NS	138	<10	298	77.5	145	156	176	41.4	154	
SHL-20	98	89	330	NS	244	<10	227	238	218	216	215	216	172	
SHL-22	27	25	32.9	NS	24.8	<10	34.8	10.6	<5.4	12.2 B	7.3	14.6	45	
SHM-96-22B	NS	NS	NS	NS	324	318 J	352	365	406	707	1,440	1,360	1,180	
SHM-93-22C	NS	NS	68.9	49.8	44.6	40.4	<10	31.6	51.1	42.8	33.2	34.4	47.8	

Table 7-4 **Comparison of Historic Arsenic Results** Shepley's Hill Landfill Groundwater Monitoring

Notes:

J: Estimated value

B: Detected in associated blank

NS: Not sampled Bold numbers indicate cleanup level exceedances (MCL cleanup level is 50 u g/L)

8.0 QUALITY CONTROL

Quality assurance/quality control (QA/QC) samples were collected to monitor the sample collection, transportation, and analysis procedures.

8.1 Field Quality Control

One set of equipment (rinsate) blank samples was collected from the pump after decontamination had been conducted for each sampling event (spring and fall) and analyzed for the full suite of analytical parameters. Results of equipment blank samples are discussed below. One field duplicate groundwater sample was collected during each sampling round at well SHM-96-5B and analyzed for the full suite of analytical parameters. Results of duplicate samples are shown on Tables 7-2 and 7-3 and are also discussed below. One trip blank sample was collected per shipped cooler, and submitted for VOC analysis only to evaluate potential cross-contamination of samples during transport. No chemicals of concern were detected in the trip blanks.

8.2 Laboratory Quality Control

One set of QA samples were also collected by the sampling team and sent to the designated QA laboratory (an independent testing laboratory) in the form of duplicates for each sampling round. The QA samples represent approximately 10% of the groundwater samples collected. A QA sample was collected during each sampling round at well SHM-96-5B and analyzed for the full suite of analytical parameters. QA samples were collected, packaged and shipped in the same manner as the other groundwater samples. Appendix F presents the Chemical Quality Assurance Report (CQAR) which provides a statistical comparison of the primary and QA laboratory results for each sampling round. Also presented in Appendix F is the Chemical Data Quality Assessment Report, which provides an overall assessment of results presented in the CQAR's, and their impact on data usability for both sampling rounds.

8.3 Data Evaluation

Fourteen groundwater samples were collected from Shepley's Hill Landfill at Devens, MA during each round of sampling. The samples were analyzed at Severn Trent Laboratories (formerly Intertek Testing Services) in Colchester, VT for Volatile Organic Compounds (VOCs), Target Analyte List (TAL) Metals, Alkalinity, Anions (including Nitrate, Sulfate, and Chloride), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Hardness, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), and Cyanide. The spring samples were collected on May 8, 9 and 11, 2000, and the fall samples on October 30, November 1 and 2, 2000 (see Groundwater Analytical Results Tables in Section 7).

The results were evaluated for acceptability in accordance with the laboratory's defined acceptance limits, with standard EPA SW846 guidance and/or with guidelines provided in the USACE Methods Compendium document.

All sample coolers were packed with ice packs and ice in the field. Sample shipments were received at the laboratory on May 9, 10 and 12, 2000, for the spring sampling, and October 31, November 2 and 3, 2000 for the fall sampling. All samples were appropriately preserved by the procedures shown in Table 8-1. There were no sample shipment or receipt anomalies associated with these samples.

Samples were extracted and analyzed in accordance with the methods and holding time requirements cited in Table 8-1.

8.3.1 Data Evaluation for Samples Collected Spring 2000

Volatile Organic Compound (VOC) Analysis

Fourteen groundwater samples were analyzed for VOCs using SW846 method 8260B. In addition, the laboratory analyzed: one field duplicate (SHM-DUP), a duplicate of sample SHM-96-5B); three trip blanks (dated 05/08/00, 05/09/00, and 05/11/00); and one equipment blank (SHL-EB, dated 05/11/00).

Laboratory Method Blank, Trip Blank and Equipment Blank Results: Target analytes were undetected at levels above the laboratory's practical quantitation limit (PQL) for method blank, trip blank, and equipment blank samples. All results are acceptable.

<u>Field Duplicate Sample Results</u>: The results of the VOCs for sample SHM-96-5B, and its duplicate, sample SHM-DUP, show less than 20 % relative percent difference for all detected analytes. The field duplicate sample shows acceptable comparative results.

<u>Surrogate Results</u>: All VOC sample surrogate recoveries are within the laboratory's stated acceptance limits. All results are acceptable.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results: One set of matrix spike/matrix spike duplicate (MS/MSD) samples was analyzed for this project. Most MS/MSD recoveries and relative percent differences (RPD) are within the laboratory's acceptance limits for VOC analysis. Twelve out of 84 spiked compounds showed MS and/or MSD recoveries which were slightly outside the acceptance range. Eleven of these exceedances are not considered to impact the results, as recovery of these compounds was not significantly outside of the acceptance range. These analytes were not detected in the field samples and are not site-specific contaminants (i.e., not summarized on the Groundwater Analytical Results Table in section 2), therefore, no action was taken. The compound, 2-Chloroethylvinylether, showed 0% recovery in both the MS and MSD sample. The laboratory report states that the acid preservative may have degraded this analyte. As this analyte is not a site-specific contaminant (and not summarized on the Groundwater Analytical Results Table in section 2), no action was taken.

Target Analyte List (TAL) Metals Analysis

Fourteen groundwater samples were analyzed for TAL metals using SW846 method 6010B or 7000 series methods. In addition, the laboratory analyzed: one field duplicate (SHM-DUP, a duplicate of sample SHM-96-5B); and one equipment blank (SHL-EB, dated 05/11/00).

Laboratory Preparation Blank and Equipment Blank Results: Target analytes were undetected at levels above the Contract Required Detection Limit (CRDL) for preparation blank and equipment blank samples. All results are acceptable.

<u>Field Duplicate Sample Results</u>: The results of the metals for sample SHM-96-5B, and its duplicate, sample SHM-DUP, show less than 20 % relative percent difference for all analytes detected above the CRDL. The field duplicate sample shows acceptable comparative results.

<u>Matrix Spike (MS) and Duplicate Results</u>: One set of matrix spike (MS) and duplicate samples was analyzed for this project. All MS recoveries are within the 75-125 % recovery acceptance limits, except Barium (70%) and Copper (138%). Barium and Copper results are qualified with "N", indicating that the MS recovery limits are outside the acceptance limits. For analytes which showed concentrations above the CRDL, the duplicate RPDs are within the 20% RPD acceptance limits for metals analysis, except for Lead (200% RPD). Lead results are qualified, "*", indicating that duplicate sample RPD values are outside of the acceptance limits. These values should be considered to be estimated due to these quality control exceedances.

General Inorganic Analyses

Fourteen groundwater samples were analyzed for general inorganic analyses, including Alkalinity by EPA method 310.1, Anions (Nitrate, Phosphate, Sulfate, and Chloride) by EPA method 300.0, Biochemical Oxygen Demand (BOD) by EPA method 405.1, Chemical Oxygen Demand (COD) by EPA method 410.1, Total Hardness by EPA method 130.2, Total Dissolved Solids (TDS) by EPA method 160.1, Total Suspended Solids (TSS) by EPA method 160.2, and Cyanide by SW846 method 9010. In addition, the laboratory analyzed: one field duplicate (SHM-DUP, a duplicate of sample SHM-96-5B); and one equipment blank (SHL-EB, dated 05/11/00).

Laboratory Preparation Blank and Equipment Blank Results: All target analytes were undetected at levels above the laboratory's practical quantitation limit (PQL) for preparation blank samples. The equipment blank sample showed detectable levels of TSS (600 ug/L). Sample values which are within five times of the amount detected in the equipment blank are qualified with a "B", indicating potential blank interference.

<u>Field Duplicate Sample Results</u>: The results of the general inorganic analyses for sample SHM-96-5B, and its duplicate, sample SHM-DUP, showed less than 20 % relative percent difference for all detected analytes, except Alkalinity which showed 23% RPD between the original and field duplicate sample result. As a result of the exceedance of RPD criteria for Alkalinity, all samples are qualified with a "*", indicating that the duplicate sample RPD values are outside the acceptance limits. Other field duplicate results show acceptable comparative results. Matrix Spike (MS) and Duplicate Results: One set of matrix spike samples was analyzed for Anions and Alkalinity. All MS recoveries are within the laboratory's acceptance limits (75-125 % recovery) except Sulfate (72% recovery). Sulfate results are qualified with "N", indicating that the MS recovery limits are outside the acceptance limits. One set of duplicate samples was analyzed for Anions, Alkalinity, Hardness, and TDS. All RPD values are within the laboratory's acceptance limits (20% RPD) except Chloride (40% RPD). Chloride results are qualified with "*", indicating that the duplicate sample RPD values are outside the acceptance limits.

Conclusion

Laboratory reports were reviewed for adherence to acceptable laboratory practices. Based on the data evaluation elements reviewed (including holding times, blank sample results, surrogate recoveries, and MS/MSD recoveries), all data may be reported without qualification, except as summarized below:

- <u>Metals and General Inorganic Analyses</u>: MS recoveries are outside the acceptance limits for Barium, Copper, and Sulfate. These values are qualified with "N", indicating that the MS recovery limits are outside the acceptance limits. These values should be considered as estimated due to these quality control exceedances.
- Metals and General Inorganic Analyses: Duplicate RPD values are outside the acceptance limits for Lead, Alkalinity, and Chloride. These results are qualified, "*", indicating that duplicate sample RPD values are outside of the acceptance limits. These values should be considered as estimated due to these quality control exceedances.
- <u>General Inorganic Analyses</u>: The equipment blank sample showed detectable levels of TSS (600 ug/L). Sample values which are within five times of the amount detected in the equipment blank are qualified with a "B", indicating potential blank interference, on the Groundwater Analytical Results table.

8.3.2 Data Evaluation for Samples Collected Fall 2000

Volatile Organic Compound (VOC) Analysis

Fourteen groundwater samples (SHL-3, SHL-4, SHL-5, SHM-96-5B, SHM-96-5C, SHL-9, SHL-10, SHL-93-10C, SHL-11, SHL-19, SHL-20, SHL-22, SHM-96-22B and SHM-93-22C) were analyzed for VOCs using SW846 method 8260B. In addition, the laboratory analyzed one field duplicate, SHL-DUP, a duplicate of sample SHM-96-5B (dated 11-02-00); three trip blanks (dated 10-30-00, 11-01-00 and 11-02-00) and one equipment blank, SHL-EB (dated 11-02-00).

Laboratory Method Blank, Trip Blank and Equipment Blank Results: Target analytes were undetected at levels above the laboratory's practical quantitation limit (PQL) for method blank, trip blank, and equipment blank samples. All results are acceptable.

<u>Field Duplicate Sample Results</u>: The results of the VOCs for sample SHM-96-5B, and its duplicate, sample SHL-DUP have no results above the laboratory's practical quantitation limit for any compound. Therefore, the field duplicate sample shows acceptable comparative results.

<u>Surrogate Results</u>: All VOC sample surrogate recoveries are within the laboratory's stated acceptance limits. All results are acceptable.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results: One set of matrix spike/matrix spike duplicate (MS/MSD) samples was analyzed for this project. Most MS/MSD recoveries and relative percent differences (RPD) are within the laboratory's acceptance limits for VOC analysis. Five out of 84 spiked compounds showed MS and/or MSD recoveries, which were slightly outside the acceptance range. Four of these exceedances are not considered to impact the results, as recovery of these compounds was not significantly outside of the acceptance range. These analytes were not detected in the field samples and are not site-specific contaminants (i.e., not summarized on the Groundwater Analytical Results Table in Section 7), therefore, no action was taken. The laboratory report states that the acid preservative may have degraded this analyte. As this analyte is not a site-specific contaminant (and not summarized on the Groundwater Analytical Results Table in Section 7), no action was taken.

Target Analyte List (TAL) Metals Analysis

Fourteen groundwater samples were analyzed for TAL metals using SW846 method 6010B or 7000 series methods. In addition, the laboratory analyzed: one field duplicate (SHL-DUP, a duplicate of sample SHM-96-5B); and one equipment blank (SHL-EB, dated 11-02-00).

Laboratory Preparation Blank and Equipment Blank Results: Target analytes were undetected at levels above the Contract Required Detection Limit (CRDL) for preparation blank and equipment blank samples. All results are acceptable.

<u>Field Duplicate Sample Results</u>: The results of the metals for sample SHM-96-5B, and its duplicate, sample SHL-DUP, show less than 20 % relative percent difference for all analytes detected above the CRDL except for aluminum which had an RPD of 52%. Therefore the aluminum result is estimated, "J", in Table 7-3 for the positive detects in both the sample and duplicate.

Matrix Spike (MS) and Duplicate Results: One set of matrix spike (MS) and duplicate samples was analyzed for this project. All MS recoveries are within the 75-125 % recovery acceptance limits, except arsenic (64%), selenium (74%) and cyanide (46%). Arsenic, selenium and cyanide are qualified with "N" in Table 7-3, indicating that the MS recovery limits are outside the acceptance limits. For analytes, which showed concentrations above the CRDL, the duplicate RPDs are within the 20% RPD acceptance limits for metals analysis, except for aluminum (52%). Aluminum results are qualified in Table 7-3 with "*", indicating that duplicate sample RPD values are outside of the acceptance limits. These values should be considered as estimated due to these quality control exceedances.
General Inorganic Analyses

Fourteen groundwater samples were analyzed for general inorganic analyses, including alkalinity by EPA method 310.1, anions (nitrate, phosphate, sulfate, and chloride) by EPA method 300.0, Biochemical Oxygen Demand (BOD) by EPA method 405.1, Chemical Oxygen Demand (COD) by EPA method 410.1, Total Hardness by EPA method 130.2, Total Dissolved Solids (TDS) by EPA method 160.1, Total Suspended Solids (TSS) by EPA method 160.2, and cyanide by SW846 method 9010B. In addition, the laboratory analyzed: one field duplicate (SHL-DUP, a duplicate of sample SHM-96-5B); and one equipment blank (SHL-EB, dated 11/02/00).

Laboratory Preparation Blank and Equipment Blank Results: All target analytes were undetected at levels above the laboratory's Practical Quantitation Limit (PQL) for preparation blank samples. The equipment blank sample showed detectable levels of TSS (600 ug/L) and TDS (7000 ug/L). Sample values, which are within five times of the amount detected in the equipment blank (3000 ug/L for TSS and 35000 ug/L for TDS) are qualified with a "B" in Table 7-3, indicating potential blank interference. The equipment blank, SHL-EB, was analyzed outside the allowed holding time for nitrate and orthophosphate (refer to the paragraph above on holding times).

Field Duplicate Sample Results: The results of the general inorganic analyses for sample SHM-96-5B and its duplicate, sample SHL-DUP, showed less than 20 % relative percent difference for all detected analytes, except COD which showed 86% RPD between the original and field duplicate sample result. As a result of the exceedance of RPD criteria for COD, both samples are qualified with a "J" in Table 7-3, indicating that they are estimated values. The results for the sample and duplicate for BOD show one non-detect and one positive detect. Since the positive result is within 5 times the quantitation limit, where analytical variability is greatest, the BOD results are not qualified. The results for the sample and duplicate for orthophosphate also show one non-detect and one positive detect. Orthophosphate was not detected in the field samples and is not a site-specific contaminant contaminants (not summarized on the Groundwater Analytical Results Table in section 7). Also, the positive detect is within 5 times the quantitation limit, where analytical variability is greatest, therefore the orthophosphate results do not need to be qualified. Other field duplicate results show acceptable comparative results.

<u>Matrix Spike (MS) and Duplicate Results</u>: One set of matrix spike samples was analyzed for anions and alkalinity. All MS recoveries are within the laboratory's acceptance limits (75-125 % recovery). One set of duplicate samples was analyzed for anions, alkalinity, hardness and TDS. All RPD values are within the laboratory's acceptance limits (20% RPD).

Conclusion

Laboratory reports were reviewed for adherence to acceptable laboratory practices. Based on the data evaluation elements reviewed (including holding times, blank sample results, surrogate recoveries and MS/MSD recoveries), all data may be reported without qualification, except as summarized below:

- <u>Metals Analyses</u>: MS recoveries are outside the acceptance limits for arsenic, selenium and cyanide. These values are qualified with "N", indicating that the MS recovery limits are outside the acceptance limits. These values should be considered as estimated due to these quality control exceedances.
- <u>Metals and General Inorganic Analyses</u>: Duplicate RPD values are outside the acceptance limits for aluminum and COD. These results are qualified, "*", indicating that duplicate sample RPD values are outside of the acceptance limits. These values should be considered as estimated due to these quality control exceedances.
- <u>General Inorganic Analyses</u>: The equipment blank sample showed detectable levels of TSS (600 ug/L) and TDS (7000 ug/L). Sample values, which are within five times of the amount detected in the equipment blank, are qualified with a "B", indicating potential blank interference, on the Groundwater Analytical Results Table.

TABLE 8-1

Parameter	Prepar- ation Method ¹	Analysis Method ¹	Sample Container ²	Minimum Volume	Preservative	Holding Time (VTS) ³
VOCs	5030B	8260B	3 X 40 mL vials with teflon septa screw caps ⁴	40 mL	HCl to pH less than 2 (No Headspace) 4+/- 2°C	14 days
Metals ⁵ Hardness	3010A NA	6010B – Trace ICAP or 7000 series 130.2	1-Liter HDPE	300 mL	HNO3 to pH less than 2	180 days (except Hg) 28 days (Hg) 180 days
Cyanide	NA	9010B	500-mL HDPE	500 mL	NaOH to pH greater than 12 plus Ascorbic Acid in excess 4+/- 2°C	14 days
Anions ⁶ Alkalinity TDS	NA NA NA	300 310.1 160.1	500-mL HDPE	100 mL 100 mL 100 mL	4+/- 2°C	48 hours for Ortho- Phosphate and Nitrate; 28 days for Sulfate and Chloride 14 days 48 hours
COD	NA	410.1	250-mL HDPE	250 mL	H ₂ SO ₄ to pH less than 2, $4+/-2^{\circ}C$	28 days
BOD	NA	405.1	1-Liter HDPE	1000 mL	4+/-2°C	48 hours
TSS	NA	160.2	1-Liter HDPE	1000 mL	4+/- 2°C	7 days

Sample Preparation and Analysis Methods, Containers, Holding Times, and Preservatives

1 "Methods for Chemical Analysis of Water and Wastes", Cincinnati, OH, March 1979, EPA 600-4-79-020. "Test Methods for Evaluating Solid Waste, Physical and Chemical Methods", U.S. EPA SW-846, 3rd Edition.

2 Additional sample containers/volume is required for matrix quality control samples.

3 VTS - Verified Time when the Sample was collected.

4 Two vials will be shipped to the laboratory; one will be measured for pH in the field to verify that the sample has been preserved correctly (i.e. pH less than 2).

5 TAL metals include Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

6 Anions include Nitrate, Sulfate, and Chloride.

NA = Not Applicable

9.0 CORRECTIVE ACTION

Corrective actions are primarily regrading and reseeding eroded areas and clearing unwanted vegetation in drainage channels. The following areas are the most critical and should be addressed before the next inspection: (1) Repair and replace the security fence and gates as required to control access to the site, (2) Place topsoil over the sandy area lacking vegetation on the east side near the new riprap channel, and (3) Remove trees from the landfill cap. Along with the corrective actions listed in the report, it is recommended that the following be performed: (1) Place stone aprons around gas vents to discourage animals from burrowing, (2) Repair and regrade around the catch basins on the south side of the landfill, and (3) Resurvey the landfill to 1-foot contours, and review in conjunction with the existing drainage system to determine why water is ponding on the northern half, and how long it remains before draining.

With the exception of the repairs mentioned above, and the other repairs recommended in the report, the landfill is in fair condition and appears to be functioning adequately.

APPENDIX A

LANDFILL MAINTENANCE CHECKLIST

APPENDIX A

Landfill Maintenance Checklist

To be completed in indelible ink.

Inspections are to be performed annually.

DATE: 30 October 2000 INSPECTOR: Jonathan Kullberg

ORGANIZATION: U.S Army Corps of Engineers, New England District

LANDFILL ATTRIBUTE	OBSERVATIONS	RECOMMENDATIONS	SAT/ UNSAT
Cover Surface	 Vegetative cover is generally satisfactory except as noted in the comments that follow. Various species growing; mowed to about 8 inches height. A large area on the southern section was not mowed. In this area, the vegetation was 18 to 24 inches high. 	1. See specific comments under the sections that follow.	SAT
	2. There are several areas where settlement is occurring.	2. Survey and compare to original.	SAT
	3. There are trees growing on the cap by gas vent #13 and to the east of gas vents #11 and #8.	3. Remove trees from cap area and reseed as necessary.	UNSAT
Vegetative Growth	1. On the west side there is a large area with sparse vegetation.	1. This area should be reseeded, with hay or straw placed on the surface, to prevent further erosion.	UNSAT
*	2. In the vicinity of the drainage ditch on the west side, there are large areas with very sparse or no vegetation. The soil is exposed where erosion control blankets were previously placed.	2. This area should be hydroseeded until vegetation is established.	UNSAT
Landfill Gas Vent Wells	1. The gas vents are in good condition. All screens and pipes are in functional condition and no repairs are required at this time.	1. Stone aprons placed around the gas vents to prevent animals from burrowing.	SAT

LANDFILL ATTRIBUTE	OBSERVATIONS	RECOMMENDATIONS	SAT/ UNSAT
Drainage Swales	1. Most of the drainage swale on the south side is being invaded by woody species. There are also intermittent zones of standing water indicating a lack of proper channel slope and drainage.	1. The south side drainage swale should be cleared of woody vegetation and regraded as needed to properly drain all areas of standing water. Depending on water velocities, the channel should then be reseeded or riprap should be placed.	UNSAT
	2. In the east side drainage swale, in the vicinity of gas vent #13 and continuing downstream to the new rock-lined channel, the drainage swale is heavily overgrown with woody vegetation and wetland species. It appears to be heavily silted in and has a large area of standing water. There is an earth and vegetation obstruction just upstream of the new rock section preventing the drainage of water and turning the channel into a pond.	2. This reach of the drainage swale should be cleared of the obstruction, all vegetation and accumulated silt and sand, and regraded to drain properly. Seeding, or riprap placement, should follow, depending on water velocities. Survey the swale to determine how to promote proper drainage.	UNSAT
	3. In the drainage swale between gas vent #3 and #4 is being invaded by wetland species.	3. Remove wetland species by mowing or hand clearing, and hydroseed.	UNSAT
Culverts	1. The concrete drainage structure at the terminus of the catch basin and underground conduit system on the south side is overgrown with vegetation, including some larger woody species, and is silting in. Standing water is present and wetland species are becoming established as well.	1. The structure and channel immediately downstream should be cleaned out and the channel regraded as required to properly drain.	UNSAT
Catch Basins	 Catch Basin #2 near the entrance to the site has a broken surface grate. Catch Basin #3 near the entrance to the site is not set at grade. The rim of the basin is about six to eight inches higher than the surrounding ground. 	 The surface grate should be replaced. The rim of this catch basin should be lowered to meet the surrounding grade. 	UNSAT UNSAT
7	3. Catch basin #7 near the southwest corner of the site is substantially overgrown by the adjacent vegetation and will soon be completely overgrown and hidden from view. The catch basin is partially filled with many small pieces of PVC pipe.	3. This catch basin should be cleared of encroaching vegetation and the PVC pipe pieces should be removed.	UNSAT

LANDFILL ATTRIBUTE	OBSERVATIONS	RECOMMENDATIONS	SAT/ UNSAT
Settlement	1. It seems apparent that many areas of the landfill are settling. The extent and its effect on the function of the landfill is unknown. Many large areas of standing water were observed in many areas of the landfill.	1. A topography survey should be conducted and compared to the original as- built topo. This will indicate where and how much settlement is taking place.	SAT
Erosion	1. On the west side near gas vent #9, a shallow sloped area is undergoing mild erosion. Vegetation is not well established and minor erosion is forming shallow gullies.	1. The placement of topsoil and seed, with erosion control should be sufficient to repair this area and stop the erosion process.	UNSAT
Access Roads	1. The access roads on the site are in good condition.	1. There are no problems on access roads which warrant repair at this time.	SAT
Security Fencing	1. The perimeter chain-link security fence is in poor condition. Fence sections and gates are missing and unrestricted access to the site is available at many locations. Some evidence of off-road vehicles (ATV's, dirt bikes, etc.) using the turfed cap area was seen.	1. The security fence should be repaired, with all missing fence sections, including gates, replaced or repaired.	UNSAT
Wetland Encroachment	1. Wetland encroachment is taking place at several locations, but is not happening on a wide scale. Overall, the areas of encroachment are small. These locations have been noted in above comments.	1. Wetland encroachment should be eliminated by simple mowing in some areas, and by regrading channels in other areas. The above comments address the actions to take at specific locations.	UNSAT
Immediate Action Require next inspection; The follow	These locations have been noted in above comments. d: The following problem areas, from among those mentioned in the comments above ving areas are the most critical and should be addressed before the next inspection:	and by regrading channels in other areas. The above comments address the actions to take at specific locations. re, are the most critical and should be addressed t	efore ti
(1) Repair and replace the	security fence and gates as required to control access to the site;		
(2) Remove trees from fai	ionn cap.		
Along with the corrective :	actions listed in the report, the following is recommended:		
(1) Place stone aprons aro	und gas vents to discourage animals from burrowing.		

(2) Repair and regrade around the catch basins on the south side of the landfill,

(3) Conduct topographic survey of entire landfill and compare to original topo survey. Determine corrective action for standing water based upon this information and existing drainage system in-place at landfill.

General Comments: With the exception of the items mentioned above, and the other recommended repairs, the landfill is in fair condition and appears to be functioning adequately.

APPENDIX B

LANDFILL GAS MONITORING FORMS

APPENDIX B Landfill Gas Monitoring

Form to be completed in indelible ink

Monitoring is to be performed annually

INSPECTOR: Kullberg/Michalak TITLE: Civil Engineer DATE: 10/30-11/1/00

ORGANIZATION: CENAE-EP WEATHER: 10/30 - Rainy, 40's 11/1 - Sunny 50's

BAROMETER: 10/30 <u>754 mm Hg</u> TIME: 0900 BAROMETER: 11/1 759 mm Hg TIME: <u>0900</u> 757 mm Hg TIME: 1500 754 mm Hg TIME: 1200

Vent No.	VOC ppm PID	O ₂ % GA-90	H ₂ S ppm CGI	LEL % CGI	CO Ppm CGI	CO ₂ % GA-90	CH4 % GA-90	Remarks
V-1	0.0	8.3	0	0	0	9.5	1.0	10/30/00
V-2	0.0	21.0	0	0	0	2.6	1.3	"
V-3	0.0	11.5	0	7	0	7.9	5.8	"
V-4	0.0	17.4	0	0	0	1.7	0.5	"
V-5	0.0	16.3	0	0	0	2.4	0	"
V-6	0.4	11.6	0	4	0	7.2	3.1	**
V-7	0.0	18.1	0	0	0	1.0	0	**
V-8	0.0	19.3	0	0	0	0.1	0	"
V-9	0.0	19.0	0	0	0	0.2	0	"
V-10	0.0	19.1	0	0	0	0.2	0	"
V-11	0.0	19.3	0	0	0	0.1	0	"
V-12	0.0	4.9	0	20	0	8.2	2.7	"
V-13	0.0	0.1	0	>100	0	14.5	19.1	11/1/00 Odor
V-14	0.0	0	0	>100	0	26.6	41.0	11/1/00 Odor
V-15	0.0	0.1	0	>100	0	26.6	27.7	11/1/00 Odor
V-16	30	0.5	0	68	0	21.8	14.6	11/1/00 Odor
V-17	40	0.1	0	>100	0	29.2	32.0	11/1/00 Odor
V-18	0.0	0.2	0	>100	0	30	39.5	11/1/00 Odor

CALIBATION INFORMATION:

Instrument: PID, 10.6 eV lamp

Results: 0.0/248 ppm isobutylene Calibrated by: Kullberg

Instrument: Industrial Scientific TMX 412 CGI

Results: 0.7% Pentane, 50% LEL, 14%/ 21% O2, 29ppm H2S, 50 ppm CO

Calibrated by: US Environmental Co

Instrument: Landtech Gem 500 GA-90

Results: 4% O2, 15% CO2, 15% CH4

Calibrated by: US Environmental Co

APPENDIX C

GROUNDWATER FIELD ANALYSIS FORMS

.

Groundwater Field Analysis Forms Spring 2000

.

GWM w	ell #	SHL3			0.	US A	rmy (Corps	of En	gineer	s
SCREEN	ED INTERVAL D	EPTH:	25.1-35.1	,		Grou	indwate	er Samp	ling Lo	g Sheet	
120 LEV	EL: PRE PUMP	INSERTION	29.82	Arm to of cas	the)	Project N	Name: S	hepley's	Hill Lan	dfill, Deve	ns, MA
	POST PUMP	INSERTION	29.73		·)'	SAMPLE MET	HOD:	EPA LOW	STRESS	METHOD	
DEPTH S	AMPLED: JA	15-4- 33				SAMPLE BOT	LES: MET	ALS/hardn	ss 1 - 1L I	HDPE (ph<2	2)
DATE: 5	18/00	TIME:	0900	0 14		CYANIDE 1 -	500ml HD	PE (ph>12))	VOC'S 3-	40ml VOA's (ph<2)
SAMPLE	BY: SS JK PY	2	SIGNATURE:	Paul Joing	R.	Anions, Alkalini	ty, TDS 1-	500ml HD	PE	COD 1 - 1	L HDPE (ph<2)
RECORD	ED BY: SS JKA	γ	SIGNATURE:	Josephilt		BOD 1 - 1L HD	PE			TSS 1 - 1L	HDPE
TIME	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pH	ORP/Eh	D. O.	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	ml/min	PURGED	TEMP C	CONDUCTANCE		mv	mg/L	NTU's	
09:37	30.34	118.0	500		12.21	23.0	5.85	207.2	12.20	5.8	clear
0944	30.24	118.0	300	1	14.82	22.0	5.70	205.1	11.36	5.9	
0952	30.25	118 0.5 JAK	200		17.30	22.0	6.11	173.1	10.81	6.3	back flushed first *
1000	30.40	121.7	350		18.50	23.0	6.11	170.2	11.43	6.4	back flushed first
1005	30.08	162.0	150	2	17.03	22.0	6.11	180.6	1152	3.3	
1011	30.39	118.5	300		19,49	22.0	6.13	170.9	11.12		back flushed front
1020	29.95	161.0	250	3	19.60	22.0	6.07	180.4	11.31	5.9	back flushed first
Shut	off pump,	removed	to inspect	, reinserted	a sen	Le Jeash	(post pu	mp inger	then me	ater leve	= 29.80')
1038	30.69	119.5	900		16.19	22.0	5.89	198.5	12.38	14,9	
1041	30.78	119.5	900	4	14.41	22.0	5.78	201.7	12.51	5.2	
1045	30.44	117.0	400		14.06	21.0	5.86	198.4	12.43	3.6	
1048	30.24	117.0	300	.5	14.95	21.0	5.95	194.4	12.20	3.7	flow slowing
				ж.			in the second				
										-	
										-	
										_	
NOTES					3%	1.6 3%	+0.1 unit	+10 mv	10%	10%	<u> </u>
SAMDIE	TAKEN AT	w-1-1	-	Calumiad Carson	Values Des			, som			

TURBIDITY # 75

Pump - Grunfos Redi-flow II

each back flush due to flow stopping

GWM w	vell #	541-4				US A	rmy (Corps	of En	gineer	S
SCREEN	ED INTERVAL D	EPTH:	57-15	-7 fort		Grou	Indwate	er Samo	ling Lo	a Sheet	
H2O LEV	EL: PRE PUMP	INSERTION	10 19	C 1.		Project Name: Shepley's Hill Landfill, Devens, MA					
	POST PLIMP	INSERTION	10.21	Ca A		SAMPLE MET	HOD	EPA LOW	STRESS	METHOD	
DEPTH S	AMPLED.	12 5 8:	10.24	Tref		SAMPLE BOTH	ES MET	Al S/hardn	ss 1 - 11 1	HDPF (nh<	2)
DATE 6	19/00	TIME	SI: CK			CYANIDE 1-	500ml HD	PE (nh>12)	VOC'S 3	40 m 1/00 s (m 2)
SAMPI FI	DRY SS IK BY		SIGNATURE	D.Ah		Anions Alkalinit	TDS 1.	500ml HD	PF	COD 1 - 1	HDPF (nh<2)
RECORD	ED BY SSLIK B	Y	SIGNATURE:	Dian	\geq	BOD 1 - 1L HD	PE	ocontin The		TSS 1 - 11	HDPF
TIME	WATER DETH	PLIMP		CUM VOLUME	H20	SPECIEIC		ORP/Eh	D.D. I	TURBIDITY	COMMENTS
24br	BELOW MP feet	SETTING	mi/mio	PURGED	TEMP C	CONDUCTANCE	pit	mv	ma/l	NTU's	COMMENTS
0913	10.25	108 2	900		1177	187.0	565	-219	0.63	21/0	Orange S.S
0917	10.33	11.9	400	1	1199	183.0	4.09	-38.3	0.42	87	clar O
0920	10.73	1010.8	500		13.21	181.0	10.18	-410	0.39	55	Litay
0923	10.37	Ida la	400	2	1344	182.0	4.2.3	-421	0.37	3.6	
2922	10.32	Lele.Le	400		13.01	180.0	6.23	-42.4	0.38	34	Vial forsing (tribut
0931	10.32	66.7	400	3	14.05	179.0	6.24	-429	0.38	2.8	
0935	10.31	46.6	300		14.51	178.0	6.24	-43.5	0.38	3.4	
0938	10.30	66.6	200	1	15.50	175.0	4.26	-47.9	0.42	4.6	flow stane
0944	10.31	77.8	300	4	17.01	170.0	6.28	-51.5	0.65	5.1.	Alone straged have
0953	10.31	67.3	550	5	12.15	173.0	6.25	- 53.7	0.36	14.1	[
0956	10.33	69.2	800	SOAK	12.79	172.0	6.26	-79.2	0.25	9.8	
1000	10.32	67.7	500	6	12.72	167.0	6.23	-46.4	0.28	4.7	
1004	10.31	67.7	200		13.90	164.0	6.25	-46.2	0.26	4,5	flow stopped
1010	10.32	70.0	300	7	13.30	170.0	6.27	-49.9	0.43	4.2	
1014	10.32	90.2	200		15.29	161.0	6.29	-50.7	0.30	3.8	
1020	10.74	69.2	800	8	13.64	167.0	6.33	-52,2	0.29	4.8	flow stop backflu
1027	10.35	49.8	800	9	12.81	162.0	6.28	-47.0	0,30	2.5	
1031	10.34	69.8	850	10	12.13	162.0	6.27	-46.7	0.29	25	
1035	10.35	69.6	800	11 to DAK	12.14	158.0	6.26	~ 44.4	0.31	2.9	
NOTES:					3%	3%	+0.1 unit	+10 mv	10%	10%	
SAMPLE	TAKEN AT: 1	145		Saturated Screen \	/olume Reg	uired 1.6 cul	4-	10 10 1000	1570	10 /	

Sun effecting temp readings

YSI# 148

GWM w SCREENI 120 LEVI	ell # ED INTERVAL D EL: PRE PUMP	SIL - S	5.1 - 15. 1.72 Rut	fect		US A Grou Project N	US Army Corps of Engineers Groundwater Sampling Log Sheet Project Name: Shepley's Hill Landfill, Devens, MA					
EPTH S ATE: 5 AMPLE	AMPLED: 111/03 D BY: SS JKPY ED BY: SS(JK)	<u>10 fect</u> TIME:	1,71 (ee) 1330 SIGNATURE: SIGNATURE:	Paul young	-	SAMPLE METHOD: EPA LOW STRESS METHOD SAMPLE BOTLES: METALS/hardnss 1 - 1L HDPE (ph<2) CYANIDE 1 - 500ml HDPE (ph>12) VOC'S 3 - 40ml VOA's (ph<2) Anions,Alkalinity,TDS 1- 500ml HDPE COD 1 - 1L HDPE (ph<2) BOD 1 - 1L HDPE TSS 1 - 1L HDPE						
TIME 24hr	WATER DPTH BELOW MP feet	PUMP	PURGE RATE	CUM. VOLUME	H20 TEMP C		pН	ORP/Eh	D. O.	TURBIDITY	COMMENTS	
1350	228	38.1	800		10.36	74	6.04	55	094	115	orange ss	
1355	2.30	38.1	008	Igallon	10.17	74	5.97	2.7	0.64	4.6		
400	2.12	35.5	500	Z	10.31	73	5.88	0.4	0.51	2.4		
1407	2.12	35.4	500		10.93	74	5.86	-2.5	0.40	2.3		
410	2.12	35.5	500	3	10.99	74	5.86	-3.4	0.37	2.2		
414	2.12	35.4	500		10.90	74	5.85	-3.7	0,36	2.4		
1418	2.12	35.5	500		11.10	74	5.84	- 4.)	0.36	1.6		
_										-		
-												
					1		D-Sach					
IOTES:	TAKEN AT.	1420		Saturated Screen	3%	3%	+0.1 unit	+10 mv	10%	10%	6	
AMPLE	TAKEN AT:	1925	27	Saturated Screen V	olume Rec	juired: 2.2.9	Allons				24	

YSI# 148 TURBIDITY# 75

CREENED 20 LEVEL: PEPTH SAMI ATE: <u>5/11</u> AMPLED B ECORDED TIME V 24hr BE 185 4	INTERVAL D PRE PUMP OST PUMP PLED: 1 0 0 Y: SSJK PY BY: 53 JK P	EPTH: INSERTION INSERTION SG Guit TIME:	81.3 - 91 4.39 4.14	1.3 fects Lever Rect	_	Grou Project I	undwat Name: \$	er Samp Shepley's	Hill Lar	og Sheet Idfill, Devens	s, MA						
	PRE PUMP OST PUMP PLED: 1 0 0 Y: SSJK PY BY: SS JK F	INSERTION INSERTION SC Cent TIME:	4.39	les" Feet	-	Project I	Name: 3	Shepley's	Hill Lar	idfill, Devens	s, MA						
PUEPTH SAMI ATE: <u>5/11</u> AMPLED BY ECORDED TIME V 24hr BE	OST PUMP PLED: 1 0 0 Y: SSJIK PY BY: SS JK F	INSERTION SG Cut TIME:	4.14	Reat													
EPTH SAMI ATE: <u>5/[]</u> AMPLED BY ECORDED TIME 24hr BI BI	PLED: 1 0 0 Y: SQUK PY BY: SS JK F	SG Reet		DTH SAMPLED: C(Part							SAMPLE METHOD: EPALOW STRESS METHOD						
ATE: 5/11 AMPLED BY ECORDED TIME V 24hr BE	Y: SOUK PY BY: SS JK F	TIME:		- 1		SAMPLE BOT	LES: MET	ALS/hardr	ss 1 - 1L	HDPE (ph<2)							
AMPLED BY ECORDED TIME V 24hr BE	Y: SSUK PY BY: SS JK F		1130	- An U.		CYANIDE 1 -	500ml HD	PE (ph>12)	VOC'S 3-40	0ml VOA's (ph<						
ECORDED TIME V 24hr BE	BY: 53 JK F		SIGNATURE:	AL.	_	Anions, Alkalini	ty, TDS 1	- 500ml HD	PE	COD 1 - 1L	HDPE (ph<2)						
TIME V 24hr BE		γ	SIGNATURE:	di h		BOD 1 - 1L HD	DPE			TSS 1 - 1L H	DPE						
24hr Bi	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pH	ORP/Eh	D. O.	TURBIDITY	COMMENTS						
R5 4	ELOW MP feet	SETTING	ml/mln	PURGED	TEMP C	CONDUCTANCE		mv	mg/L	NTU's							
2	1.54	58.0	500		10.15	629	5.93	-54.2	4.04	6.8							
40 4	,45	48.6	350		9.89	808	6.24	-150.3	2.23	5.74							
45 4	.68	48.4	HOU.	194132	9.96	839	6.53	-165.7	1.75	2.1							
150 4	.65	48.6	400		10.08	845	6.63	-175.4	1,69	2.0							
155 41	165	48.6	450	Zaylians	10.15	851	6.67	-180.8	1.67	1.5							
200 4.	.65	48.6	400		10,17	852	6.71	-182.6	1.57	1.3							
205 4.	.65	48.6	400	3 gallons	10.16	853	6.71	-183.7	1.64	5.5							
210 4.	65	48.6	400	that is	10.16	853	6.73	-1841.2	1.57	2.3							
215 4.	.65	48.6	400	4 Gullins	10.16	853	6.73	-185.0	1.56	3.8							
220 4.	65	48.6	400	5 Gullons	10.18	855	6.72	-184.9	1.65	3,7							
225 4.	.65	48.6	400		10.20	855	6.73	-184.7	1.83	3.4	-						
230 4,	65	48.6	400	legallond	10,20	\$55	6.74	-185.2	1.72	2,9							
235 4	65	48.6	400	G.S yullon	10.27	856	6.73	-186.1	1.71	2.7							
					1	1.1.2											
						1		1		1							
										1							
	· · · · ·						-		1.00								
()					1												
					ALL												
					11	11	11	11	-								
OTES: AMPLE TAP	KEN AT:	235		Saturated Screen	to.3 3 N Volume Re	% ±25 3% equired: /3	5 +0.1 uni	t +10 mv	± 0.1	2 30%							

Pump - Grunfos Redi-flow II

YSI# 148

TURBIDITY # 75

GWM w	ell# c	11-M-96	-50			US A	rmy (Corps	of End	aineers	
CREEN	ED INTERVAL D EL: PRE PUMP	EPTH: INSERTION	50.8 - 60 3.83 Real	.8 feet	-	Grou Project N	ndwate lame: S	er Samp Shepley's	ling Log Hill Land	g Sheet Ifill, Dever	is, MA
EPTH S	POST PUMP AMPLED:	INSERTION 56 Rut TIME:	3.82 fuit	J.11 A		SAMPLE METH SAMPLE BOTH CYANIDE 1 - 5	HOD: ES: MET 500ml HD	EPA LOW ALS/hardns PE (ph>12)	STRESS	<u>METHOD</u> IDPE (ph<2) VOC'S 3 - 4	IOml VOA's (ph<
ECORD	ED BY: SS JR P	Y	SIGNATURE: <	JackACK		BOD 1 - 1L HD	PE	0001111101		TSS 1 - 1L	HDPE
TIME 24hr	WATER DPTH BELOW MP feet	PUMP SETTING	PURGE RATE	CUM. VOLUME	H20 TEMP C	SPECIFIC CONDUCTANCE	pН	ORP/Eh mv	D. O. mg/L	TURBIDITY NTU's	COMMENTS
1240	3.40	47.7 1/2	600		9.62	732	6.03	-0.6	5.29	2.5	clear
245	3.90	47.6	600	1 gallon	9.93	847	6.43	-52.5	7.21	2.3	
250	3.90	47.7	600	and the second second	10.03	851	6.46	-56.4	8.09	2.8	
253	3.90	47.8	600	2	10.04	852	6.47	-57.1	8.52	3.0	
256	3.90	47.8	550		10.05	852	6.47	-57.2	8.76	3.8	
259	3.90	47.7	550	3	10.06	851	6.48	-57.6	9.17	2.4	
303	3,90	47.8	600	4	10.11	850	6.48	- 55.1	9.42	2.3	
1308	3.90	47.8	550	< in	10.10	850	6.48	-56.4	9.86	2,2	
1312	3.90	47.7	600	5	10.11	849	6.49	-56.2	10.04	1.9	
317	3.90	47.8	600		10.13	848	6.48	-55.7	10.38	1.6	
320	3.90	47.8	550	6	10.12	848	6.48	- 55,9	10.24	1.6	
323	3.90	47.6	650	6 2	10.19	846	6.48	-55.8	/0.78	1.1	
_											
VOTES:					3%	3%	+0.1 unit	+10 mv	10%	10%	
AMPLE	TAKEN AT:	1225	22	Saturated Screen	Volume Rec	uired: /3 0 00	11	a state of the sta	,	10/0	

WM w CREENI 20 LEVI	eII # ED INTERVAL D EL: PRE PUMP	SHLC DEPTH: INSERTION	15.0-25 7.96 f	to feet	-	US A Grou Project I	Army (Indwate Name: S	Corps er Samp Shepley's	of En oling Lo Hill Lan	gineers og Sheet offill, Deve	S ms, MA	
EPTH S ATE: AMPLEI ECORD	POST PUMP AMPLED: 5/9/00 DBY: SSUM PY ED BY: SS (JK)F	INSERTION	7.50 fe 13.50 SIGNATURE: SIGNATURE:	et BackAK Jakak		SAMPLE METHOD: EPA LOW STRESS METHOD SAMPLE BOTLES: METALS/hardnss 1 - 1L HDPE (ph<2) CYANIDE 1 - 500ml HDPE (ph>12) VOC'S 3 - 40ml VOA's (ph< Anions,Alkalinity,TDS 1- 500ml HDPE COD 1 - 1L HDPE (ph<2) BOD 1 - 1L HDPE TSS 1 - 1L HDPE						
TIME	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pH	ORP/Eh	D. O.	TURBIDITY	COMMENTS	
24hr	BELOW MP feat	SETTING	ml/min	PURGED	TEMP C	CONDUCTANCE	0.0	mv	mg/L	NTU'S	read the bound	
359	1.65	59.3	400	1	11.40	80	3.55	150.0	0.08	36.5	Sysp. solidy	
909	-1.66	59.5	400		12.11	85	5.76	133.7	0.07	24.5		
410	7/7	59.7	300	2	17 20	107	610	108.4	D AG	16 13		
HID	1.61	565	HOO		17.25	Inf	613	GAR	6.36	14.2	1	
425	7.67	59.5	400	3	12 29	114	6.16	78.7	0.33	75	harters	
432	7.70	59.8	500	- Y	111.3	119	6.18	475	0.27	83	Duckwashe	
437	7.20	548	500		11.75	122	6.24	35.4	0.26	63		
440	7.70	59.8	500	5	11.79	124	6.27	26.7	0.24	55		
444	7.70	59.8	500		11.77	125	1.26	21.3	0.84	48		
447	7.70	59.8	500		11.69	127	6.27	17.0	0.24	6.5		
450	7.20	59.8	500	10	11.81	130	6.29	11.2	0.24	4.9		
452	7.70	59.8	500		11.67	127	6.26	7.3	0.24	4.7		
455	7.71	59.8	500	7	11.83	130	6.30	2.8	0.23	4.2		
500	7.71	59.7	500		12.01	132	6.32	-1.7	0.25	3.1		
504	7.71	59.8	500	8	11.92	133	6.31	-3, 3	0.24	3.6		
OTES: AMPLE	TAKEN AT: \	510	2>	Saturated Screen	3% Volume Req	3% uired: 3,2 ga	+0.1 unit	+10 mv	10%	10%		

YSI # 148

GWM w	ren #		SHL-10		×	US A	rmy C	orps	of En	gineer	s
SCREEN	ED INTERVAL D	EPTH:	17.8 - 3	7.6		Grou	ndwate	r Samp	ling Lo	g Sheet	
120 LEV	EL: PRE PUMP	INSERTION	3012	5'		Project N	lame: S	hepley's	Hill Lan	dfill, Deve	ens, MA
	POST PUMP	INSERTION	30.2	5'		SAMPLE METH	HOD:	EPA LOW	STRESS	METHOD	
DEPTH S	AMPLED:	34'				SAMPLE BOTL	ES: MET	ALS/hardn	ss 1 - 1L I	HDPE (ph<	2)
DATE:	5161800	TIME:	1320	0 00		CYANIDE 1-5	500ml HDF	PE (ph>12)		VOC'S 3-	40ml VOA's (ph<2)
SAMPLE	DBY SS JKPY		SIGNATURE:	Paul Joury		Anions, Alkalinit	y,TDS 1-	500ml HD	PE	COD 1 - 1	L HDPE (ph<2)
RECORD	ED BY: SS JK	γ	SIGNATURE.	Sala 1-		BOD 1 - 1L HD	PE			TSS 1 - 1L	HDPE
TIME	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pH	ORP/Eh	D. O.	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	ml/min	PURGED	TEMP C	CONDUCTANCE		mv	mg/L	NTU's	
1425	30.24	118.0	400		14.52	32.0	4.59	156.3	12.39	4.8	clear
1430	30.25	118.0	400		15.31	33.0	4.81	146.6	12.27	4,6	
1434	30.20	117.2	250		15.99	33.0	4.95	144.4	12.12	5.7	
1438	30.19	117.2	150	2	16.44	34.0	5.04	144.0	11.92	5.7	
1441	30.19	118.0	250		17.22	35.0	5.01	142.2	11.71	4.8	
1445	30.18	118.0	200		18.12	35.0	4.98	141.4	11.45	2.0	
1450	30.19	121.8	150		18.72	35.0	4.94	142,3	11.30	3.4	
1455	30.18	169.7128.3	700		19.55	34.0	5.00	140.3	11.21	8.5	
1500	30.25	169.7	350	3	18.77	33.0	4.84	122.8	11.39	5.5	flow stopped, beiting,
1511	20.18	187.7	150		20.24	239.34	4,83	131.0	10.76	7.7	flow stronged barts
1518	2029	121.5	1000	4	22.96	35.0	4.66	94.6	10.66	12.5	(Jupped)
1522	20.24	118.7	250	1	17.95	34.0	4.65	129.6	11.13	7.5	
1525	20.20	118.7	200		17.53	33.0	4.63	132.7	11.21	7.7	
1528	30.21	118.7	200	5	17.71	34.0	4.63	140.9	11.11	6.5	
	0000100				_				-		
	÷ .										
				-							
							-		-		
NOTES:		0.000			3%	3%	+0.1 unit	+10 mv	10%	10%	6
SAMPLE	TAKEN AT:)	530		Saturated Screen	Volume Req	uired: 2,4a	allons	_			
Gat	to beer al	- Will + + +)-	conclud	while still	flowing	U					
	1000 51	N- II	, <u>surpres</u>	1 . 4.1							
NOTE	SI WELL	DEPth 1	5 37.6	NOT 411.8 AS	Stated,						

GWM w	eii #	SHM-93	3-10C	Shee	+ 1/2	US A	rmy (Corps	of En	gineers	5
CREENE	DINTERVAL D	EPTH:	45.7 - 55	7 leat		Grou	ndwate	er Samp	ling Lo	a Sheet	
20 LEVE	L: PRE PUMP	INSERTION	79 28 P.	F		Project N	lame: S	hepley's	Hill Lan	dfill. Deve	ns. MA
	POST PLIMP	INSERTION	29 05 1	h-	•	SAMPLE METH	HOD'	EPALOW/	STRESS	METHOD	
EDTH S	MDI ED.	EI Qual	chor feel	F		SAMPLE BOTH	ES. MET	AI S/bardne	e 1 . 11	JDDE (phc)	
ATE: C	CICION	JI Ker	0630			CVANIDE 1 F		DE /nhs12	55 1 - 1L I	VOCIE 2	10ml VOA's (pbc)
ANDIER	DV CC IN DV		SICNATURE:	Q 04.		Anione Alkelinit		500ml UD	DE		
AMPLEL	D DV. CO	in A	SIGNATURE.	Fauring	-	Anions, Aikainit	y,105 1-		FE .		
ECORDI	ED BT. Sacing	<u>.</u> ŋ	SIGNATURE.	yachairi		BOD 1- IL HD		-		155 1-1L	HUPE
TIME	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pH	ORP/Eh	D. O,	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	mi/min	PURGED	TEMP C	CONDUCTANCE		mv	mg/L	NTU's	
1115	29.89	122.5	700		12.14	469.0	6.51	-10.8	4.27	16.9	Clear
122	30.40	121.3	400		13.30	470.0	6.71	-33.0	2.73	18.9	
1126	30.39	120.8	400		13.71	471.0	6.86	-39.5	2.04	17.1	
1130	30.40	120.0	300	2	13.94	469.0	6.92	-37.8	1.85	14.8	
1133	30.35	120.2	300		13.98	473.0	7.02	-37.1	1.67	15.5	
1142	30.36	121.0	500	3	13.93	472.0	7.10	-66.4	1.04	6.4	
1146	30.51	121.3	500		14.32	472.0	7.13	-89.6	0.74	4.7	
1150	30.58	121.3	400	4	14.35	471.0	7.16	-100.3	0.64	4.1	
155	30.61	121.3	400		1444	4720	7.20	-111.9	0.54	4.3	
200	30.64	/21.3	400		14.42	472.0	7,20	-)13.7	0.50 .	2.7	
204	30.106	121.3	400	5	14.47	472.0	7.22	-118.7	0.48	3.1	
207	30.107	121.3	400		14.53	472.0	7.23	-121.6	0.45	3.7	
1211	30.68	121.3	400	6	14.57	471.0	7.23	-122.2	0.42	27	
218	30.70	121.3	400		14.67	472.0	7.26	-124.8	0.38	3.0	
225	30,71	12/13	400		14.74	471,0	7,29	-129,9	0.37	2.71	
230	30.71	121,3	400		14177	# -378,0-	7,29	-1321	0,35	2,39	
235	30,72 .	121,3	400		14,80	# 378-0	7,30	-13/,0	0,34	2,33	
240	30,72	12113	400	8,5	14,88	\$ 380.0	7:32	-128,8	0,34	2,73	UIAL FOGGING U
250	30.73	1213	400		14.70	470.0	731	-125.9	0.30	17	(we ald ity !
255	3073	121.3	400	10	14.82	469.0	7.33	-126.1	0.30	2.1	continued
OTES:	5				3%	3%	+0.1 unit	+10 mv	10%	10%	
AMPLE	TAKEN AT:		2*	Saturated Screen	Volume Requ	uired: 1.3.0 9	51			*	

* read conductivity by mistake

YSI# (07

GWM W SCREENI 120 LEV	ell # ED INTERVAL D EL: PRE PUMP	SHM- EPTH: INSERTION	93-10C 45.7-55 29.28 fo	The t	ut 2/2	US A Grou Project N	ndwate	Corps (er Sampl Shepley's	of Engling Lo Hill Lan	gineers g Sheet dfill, Deve	S ens, MA
DEPTH S DATE: SAMPLEI RECORD	POST PUMP AMPLED: 5/8/00 DBY: SS JK(P) ED BY: SS (JK)P	INSERTION 51 fee TIME:	29.09 f 	Paul Young	-	SAMPLE METI SAMPLE BOTI CYANIDE 1 - 5 Anions, Alkalinit BOD 1 - 1L HD	HOD: _ES: MET 500ml HD ty,TDS 1- PE	EPA LOW ALS/hardns PE (ph>12) 500ml HDF	<u>STRESS</u> is 1 - 1L I PE	<u>METHOD</u> 1DPE (ph<2 VOC'S 3 - COD 1 - 1 TSS 1 - 1L	2) 40ml VOA's (ph<2 L HDPE (ph<2) HDPE
TIME 24hr	WATER DPTH BELOW MP feet	PUMP SETTING	PURGE RATE	CUM, VOLUME	H20 TEMP C	SPECIFIC CONDUCTANCE	pН	ORP/Eh mv	D. O. mg/L	TURBIDITY NTU's	COMMENTS
1300	30.75	121.3	400		14.96	469.0	7.33	-128.0	0.30	1.7	continention
1305	30.75	121.3	400		14.99	469.0	7.34	-127.2	0.28	1.6	
310	30.75	121.3	400		14.90	469.0	7.33	-124.2	0.29	1.9	
1315	30.76	121.3	400	12	14.93	469.0	7.36	-129.1	0.29	1.4	
320	30.77	121.3	400		15.04	469.0	7.36	-131.3	0,29	0.9	
325	30.77	121.3	400	/3	14.99	468.0	7.36	~128.5	85.0	1.4	
_											
NOTES: SAMPLE	TAKEN AT:	1330 hour	s 2)	Saturated Screen	3% Volume Req	3% uired: /3. ¢ 4	+0.1 unit	: +10 mv	10%	10%	6

÷

WM v	ven #	ShL - 1	l	u - 42	19-14-	US A	rmy	Corps	of En	gineer	S
CREEN	ED INTERVAL	DEPTH:	14.8 - 24	7. 5 feet		Grou	indwat	er Sam	oling Lo	g Sheet	
20 LE\	EL: PRE PUMP	INSERTION	18.47 Per	F	3	Project N	lame:	Shepley's	s Hill Lar	dfill, Deve	ens, MA
	POST PUMP	INSERTION	18.46 Reet		3	SAMPLE METH	HOD:	EPA LOV	V STRESS	METHOD	
EPTH S	SAMPLED:	24 Reet			-	SAMPLE BOTL	ES: ME	TALS/hard	nss 1 - 1L	HDPE (ph<	2)
ATE:	5/9/02	TIME:	1200			CYANIDE 1-5	500ml H	DPE (ph>12	2)	VOC'S 3	- 40ml VOA's (ph<2
AMPLE	D BY: SOK PY		SIGNATURE:	- AA	3	Anions, Alkalinit	y,TDS 1	- 500ml HE	DPE	COD 1 - 1	IL HDPE (ph<2)
ECOR	DED BY	Pγ	SIGNATURE:	Al		BOD 1 - 1L HD	PE			TSS 1 - 1L	HDPE
TIME	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	рН	ORP/Eh	D. O.	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	ml/min	PURGED	TEMP C	CONDUCTANCE		mv 250	mg/L	NTU's	U RODY
07	18.41	90.5	100	1. 11	13.00	665	-	35.0	2.75	900	Very Oringe
210	1811	90.5	600	1 gallon	12.20	671	-	21.3	243	50	
613	10 41	9/0.5	600	6 gellani	13,37	7.11		-10 2	363	17	
220	18.47	10.0	600	2.11	12.15	114	-	10.3	112	10	-
220	18 47	641	600	SGETION	13.58	720	-	-271	4.07	99	
20	18 42	90.6	600	Andur	13.13	740		- 36 7	11 414	9 P	
10	10 47	90 6	600	(9411-1 5	12.62	730		- 33 3	465	1.0	1
40	18, 90	10.0	600	7 5610~)	13,00	13-		31.3		10.1	
-			1						1.		
-					-	1	-	-	1	10000	1 20
						1	-	1	-		
-									1		
							-		-	-	
				the second second	1200			1000			
				1						-	
					1	1					
-					1	1					
						1	1.00			1	1
-				-	1	+71		V	V	V	1
OTES:	TAKEN AT:	240		Saturated Screen	ڈ ڈی	6 121 3% quired: 3,5 54	+0.1 un	it +10 mv (Sven	10.410%	21 10%	(actual)
				1				and the second	6	0.	0 1 1
lob	Ph bulb	brok.	carly in	day H	unber .	the readings	not	take	n (u	een fax	H, naakday)
			**.). · ×							0.000	

YSI # 107 TURBIDITY # 76

GWM \	ven #	SHL-1	9			US A	rmy	Corps	of En	gineer	s
CREEN	ED INTERVAL	EPTH:	17-32	leet		Grou	ndwat	er Sam	oling Lo	g Sheet	
120 LEV	EL: PRE PUMP	INSERTION	22.41	cet		Project N	lame:	Shepley's	s Hill Lar	dfill, Deve	ens, MA
	POST PUMP	INSERTION	77.42 6	Pert	_	SAMPLE METH	HOD:	EPA LOV	V STRESS	METHOD	
EPTH	SAMPLED:	7.5 Reet			-	SAMPLE BOTL	ES: ME	TALS/hard	nss 1 - 1L	HDPE (ph<	2)
ATE:	5/5/00	TIME:	0830	- N D		CYANIDE 1-5	500ml HI	OPE (ph>12	2)	VOC'S 3-	40ml VOA's (ph<2)
AMPLE	D BY SSAK PY		SIGNATURE:	- MA		Anions, Alkalinit	y,TDS 1	- 500ml HI	OPE	COD 1 - 1	L HDPE (ph<2)
RECOR	DED BY SS JK	γ	SIGNATURE:	dh	-	BOD 1 - 1L HD	PE			TSS 1 - 1L	HDPE
TIME	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pH	ORP/Eh	D. O.	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	ml/min	PURGED	TEMP C	CONDUCTANCE		mv	mg/L	NTU's	
930	22 41	100.3	400		12.08	113.0	-	-0.4	7.41	90	Orange Tint
935	22.41	101.8	700	Igallon	11.30	112.0	-	4.0	5,00	70	
940	22.41	101.8	800	Zgellars	11.56	113.0	-	-0.8	4.32	41	
945	22.41	101.8	800	3sullan)	11.49	116.0	-	10.5	3.34	28	
950	22.41	101.8	800	4 56112-1	11.52	106.0	14	24.2	2.46	22	
155	22.41	16).8	800	5 Gulbas	11.52	105,0	-	26.4	2.49	16	
000	22.41	101.8	800	6 nellons	11.62	98.0	4	30.4	2.45	150	Orange Tint again
005	22.41	101.8	800	7gallons	11.54	93.0	-	34.0	2.40	56	
010	22.41	101.8	800	Scallons	11.53	93.0	-	36.8	2,61	17	
015	22.41	101,8	800	9 gallon	11.54	68.0		48.5	2.92	11	
020	22.41	101.8	800	10 gullon	11.54	83.0	-	52.4	3.18	9.6	
025	22.41	101.8	800	11 0010-13	11.64	81.0	1.40	52.9	3.27	7.0	
030	22.41	101, 8	800	12 gulling	11.58	80.0	-	54.2	3,40	7,5	
235	22.41	101.8	800	13 94112-1	11.56	6,58	-	55.5	3.46	6.9	Sample take
					V	V	1	V	V		
OTES:	TAKEN AT:	1035		Saturated Scree	to، 3 3° n Volume Re	% ここれ 3% quired: /こらく//・	-) +0.1 un	iit +10 mv	± 0.3 ^{10%}	*o, 7 109	6 -
der	DI alb	#107	. P. 1	1. Almer		medica	in a h	L.K.	- 1111	P: QL	I His put

YSI# 107

GWM V SCREEN 120 LEV DEPTH S DATE: SAMPLE RECORI	Veil # IED INTERVAL D VEL: PRE PUMP POST PUMP SAMPLED: S/9/00 D BY: SS JK PY DED BY: SS JK PY	SHL-2 EPTH: INSERTION INSERTION 46.0 f. TIME:	9 41.0 - 51. 18.84 18.84 18.84 11:55 SIGNATURE: SIGNATURE:	o fact eat Jack		US A Grou Project N SAMPLE METH SAMPLE BOTH CYANIDE 1 - 5 Anions,Alkalinit BOD 1 - 1L HD	Indwate Jame: S HOD: LES: MET. 500ml HDI ty,TDS 1- PE	PE (ph>12) 500ml HD	OTEN ling Lo Hill Lan <u>STRESS</u> ss 1 - 1L PE	gineers og Sheet dfill, Devel <u>METHOD</u> HDPE (ph<2 VOC'S 3- COD 1 - 11 TSS 1 - 1L	ns, MA) 40ml VOA's (ph< - HDPE (ph<2) HDPE
TIME	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pН	ORP/Eh	D, O.	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	ml/min	PURGED	TEMP C	CONDUCTANCE		mv	mg/L	NTU's	
209	18.86	936	300		13.77	822.0	6.39	-60.7	1.64	6.9	Clear
215	18.87	95.1	800		14.07	829.0	637	-65.4	1.37	1.1	
220	18.87	94.3	600		14.10	831.0	6.31	-63.5	1.21	3,4	
223	10.08	99.3	600	2	14.31	621.0	1.42	-66.9	1.31	4.1	
131	10.88	94,2	600	2	19.37	830.0	140	-60.0	134	3.7	
227	18.08	- AU 2	4.00	u	14.41	830.0	6.70	-1.81	1.57	21	
122	18.80	943	100		14 82	830,0	1. 110	-107.9	1.24	23	
242	10.00	94.3	200	5	14 44	832.0	630	-169	138	2.5	
147	18.00	943	1.00	T.	14.26	833 0	4.39	-689	1.33	2.4	
251	88.81	94.3	600	61/2	14.26	834.0	6.42	- 69.4	1.24	1.7	
IOTES: SAMPLE	TAKEN AT:	1255	ax	Saturated Screen	3% Volume Requ	3% uired: /3 q.a	+0.1 unit	+10 mv	10%	10%	(

YSI# 448 1

TURBIDITY # 75

GWM w	vell #	SHL-2	2			US A	rmy C	Corps	of Eng	gineers	
CREEN	ED INTERVAL D	EPTH:	106.0-1	16.0		Grou	Indwate	r Samp	ling Lo	g Sheet	
120 LEV	EL: PRE PUMP	INSERTION	5.21 foot	t		Project N	Name: S	hepley's	Hill Lan	dfill, Dever	ns, MA
	POST PUMP	INSERTION	4.93 fe	et		SAMPLE MET	HOD:	EPA LOW	STRESS	METHOD	
DEPTH S	SAMPLED:	111 free	A			SAMPLE BOTI	ES: MET	ALS/hardn:	ss 1 - 1L H	HDPE (ph<2)
DATE:	5/11/00	TIME:	0835	-		CYANIDE 1 -	500ml HDI	PE (ph>12)		VOC'S 3-	40ml VOA's (ph<
AMPLE	D BY: SS(JR)PY		SIGNATURE:	JachAll	-	Anions, Alkalini	ty, TDS 1-	500ml HD	PE	COD 1 - 11	HDPE (ph<2)
RECORD	ED BY: SSUR	γ	SIGNATURE:	Jacht	-	BOD 1 - 1L HD	PE			TSS 1 - 1L	HDPE
TIME	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pH	ORP/Eh	D. Q.	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	ml/min	PURGED	TEMP C	CONDUCTANCE		mv	mg/L	NTU's	
1925	5.64	61.0	400		9.17	798	6.60	144.8	4.41	22.1	clear
934	5.73	61.0	*400	1 gallon	9.42	908	6.73	-37.5	2,96	9.0	
1938	5,74	61.0	400	. 0	9.56	916	6.74	-81.9	2,43	2.8	
2943	5.76	61.0	450	2	9.63	918	6.79	-94.4	2.23	1.8	1
949	5.77	61.0	450		9.68	919	6.79	-98.2	2.62	2.2	
954	5.78	61.0	450	3	9.84	919	6.80	-98.5	2.37	1.4	
959	5.80	61.0	450		10.09	919	6,81	-100.0	2,07	0.9	
004	5.83	61.0	500	4	9.95	921	6.81	- 99.9	2.11	0.9	
800	5.86	61.0	500		10.08	921	6.82	-100.2	1.71	0,9	
014	5.84	60.2	450	5	10.16	920	6.83	-100.1	1.83	0.9	
017	5.81	60.2	450		10.19	920	6.83	-100.1	1.82	0.8	
020	5.8)	60.2	450	6	10.23	921	6.82	-100.2	1.72	0.8	
024	5.81	60.2	450	642	10.31	920	6.83	-99.8	1.52	0.8	
							1.				
OTES:		1			3%	6 3%	+0.1 unit	+10 mv	10%	10%	
AMPLE	TAKEN AT:	1030	2.	Saturated Screen	Volume Red	uired: /3.0		2.2.6.6222.	1.5 1.6		

GWM V SCREEN H2O LEV	Vell # IED INTERVAL (IEL: PRE PUMP	SIIM- 96 DEPTH: INSERTION	- 223 63 - 93 R 5.08	ut Leep	2	US A Grou Project	Army (undwate Name: S	Corps er Samp Shepley's	of Engling Lo	g ineer : g Sheet dfill, Deve	S ens, MA
DEPTH S DATE: SAMPLE RECORE	POST PUMP SAMPLED: 5/11/03 D BY: SS()PY DED BY: SS()R)	INSERTION 78 Rest- TIME: PY	5.06 0F30 SIGNATURE: SIGNATURE:	Jarlat M	-	SAMPLE MET SAMPLE BOT CYANIDE 1 - Anions,Alkalin BOD 1 - 1L HE	HOD: LES: MET 500ml HD ity,TDS 1- DPE	EPA LOW ALS/hardn PE (ph>12 500ml HD	<u>STRESS</u> ss 1 - 1L I) PE	<u>METHOD</u> IDPE (ph<2 VOC'S 3 - COD 1 - 1 TSS 1 - 1L	2) 40ml VOA's (ph<2) L HDPE (ph<2) HDPE
TIME	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pH	ORP/Eh	D. O.	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	ml/min	PURGED	TEMP C	CONDUCTANCE		mv	mg/L	NTU's	
1045	5.11	57.7	500	1	8.67	862	7.72	203,1	7.71	35	Yellowish Color
10:50	5.10	56.5	690	19cllon	9.66	665	6.75	-10117	0.61	10	
1055	5,10	56.0	690	2	9.61	101	6.61	-102,1	0.51	112	
100	5.10	56.0	700	3	9.70	78/	6.71	-104.1	9.34	0.0	
1105	5.10	36.8	700	17	9.13	181	6.72	-105.1	9.88	7.8	r1. *
110	5.10	36.8	700	3	7.00	788	6.72	-105.8	10.34	10.7	Clearing
1115	5.11	56.0	700	17	9.01	787	6.12	-100.4	10.61	10.7	
1120	5.0	50.0	-700	6	0.81	950	6.73	-107.5	10.09	0.5	1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-
1120	5.11	56.0	120	9	7.01	167	6.19	-110.5	10.90	117	
1130	5.11	50.0	1100	10	7.70	907	6.19	-121.5	10.17	112	
100	5.07	550	450	10	9 57	047	6.81	-120.5	11.08	UP	
1143	510	500	700		9.80	948	18.01	-1250	11.00	24	
114/	510	557	700	10	97=	000	6.01	103.0	11.30	<u> </u>	
1149	510	623	700	12	9.78	900	6.02	-1070	11.40	<u>4.1</u>	
								141.0			
NOTES:					3%	3%	6 +0.1 unit	+10 mv	10%	10%	

GWM V	vell #	CILLA AS	2 770			USA	rmv	Corps	of Er	aineer	s
ODEEN		<u>511/0-11</u>		P I	e.	Grou	indwat	or Somr	lingle	a Shoot	
GREEN		DEPTH:	124 - 13	y tect	1	Broingt	lamo	er Samp		Jy Sheet	no MA
20 LEV	EL: PRE PUMP	INSERTION	6.30 K	set	e l	FIOJECLI	vame.	Shepleys		Iuliii, Deve	IIS, MA
	POST PUMP	INSERTION	4.90 Ke	1	6	SAMPLE MET	HOD:	EPALON	STRESS	SMETHOD	
EPTH	SAMPLED:	125				SAMPLE BOT	LES: ME	ALS/nardr	ISS 1 - 1L	HUPE (ph<2	2)
ATE:	5/11/00	- TIME:	0815	- Job 1		GYANIDE 1-	SUUMI HL	JPE (pn>12	()	VOUS 3-	40ml VOA's (ph<
AMPLE	DBY: 55 JK PY		SIGNATURE	AA-		Anions, Aikalini	ty, IDS 1	- 500mi HL	IPE	TOD 1 -1	L HDPE (pn<2)
ECORI	JED BY: 30-JK		SIGNATURE:	, xh		BOD 1 - IL HL		1	1	155 1-1L	HUPE
TIME	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pH	ORP/Eh	D. O.	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	ml/min	PURGED	TEMP C	CONDUCTANCE	1.7.175	mv	mg/L	NTU's	د بابه
915	1.30	11.8	1800	194112	7.98	605	1.52	-48.6	1.50	1.8	greyish, whiter
1920	9.16	77.8	1900	Conllons/391	10.00	602	1.51	-74.6	1.90	6.1	Sulfur color
125	11.00	17.8	800	Agelling / 9 gelling	10.19	549	1.61	-118.5	2.31	5.8	1
130	13.86	88.0	1100	Ocullans 10 11	16.51	517	7.61	-142.1	2.64	6.8	
437	15.80	60.0	6.00	Tunllon / & Gulleg	10.55	571	7.61	-152.7	3.00	6.1	
940	12.45	1000	500	MShlon //Sellon	10,41	578	7.60	-1644	3.31	6.5	
947	17.00	70.0	250		10.01	6.00	17.40	-1602	4.16	5.7	
990	20.45	98.0 64 C	350	d a n	10.10	600	1.61	-160,0	4.20	0.1	
457	20.75	90.0	200	11 Gallans	10.15	600	1.61	103.1	4.20	C C	5. 11. 0
000	27 2.2	10.0	150	12. 11	10.00	6120	1.61	-15/ 7	4.26	2.8	Pluce Stragel
005	22 10	104.5	1:00	12 1	10:17	bot	1.00	11.28	461	53	
15	23.25	104.5	250	15 yellen	10.56	603	711	-11.34	4.50	55	
610	23 35	104.5	200	(Berlin	10 82	603	7.60	-115 2	4.55	5 10	
010	72.25	104.5	70.7	111 SCIERS	1.283	603	7.40	-164 7	9,00	5.5	1
1074	72 35	10415	7 80	14.5 0.14	10.57	603	7.60	164.2	5.03	516	
001	63.75	10.1.7		111 your	10101			-10110	1-1		
1					100					1.	1
					1						
					r	1.12	14		1		
OTES		-			10.3 3	% +18 3%	6 +0.1 un	it +10 mv	10%	10%	
AMPLE	TAKEN AT 1	025		Saturated Screen	Volume Re	auired 13		a round	209	0 107	
a with Et		005			- craine rite	denoar 10					
Ull	her histo	a ne m	vousimal to	ine recharge	until	dam- d		h 7.	alut	below	puc.
	11(2) 11.5.0	-1 0. u		100.04		0.010	200	1 60			
ihvef	wre Well	will be	drum do	un to zo cut	and	then try to	Stubil	te with	Inche	r floor	rak
		TUDDIDITY			Duma O	ninfra Dadi flam	1	0-110	10000		STATE OF

AL 1105 Drawbon a 222 - 630 ber 2 150 ber × 0.652 sul/Ent 2 10.5 will . Compared to 12 parsed (11the rectange)

Groundwater Field Analysis Forms Fall 2000 $\hat{\mathbf{x}}$

•

SIKEN	1		11	Ref. P.t.	SAMPLE BOT	ES! MET	ALS/hardn	ss 1 - 1L I	HDPE (ph<2	2)
SS JKPY	S	IGNATURE:	Paul young	248.5 NCAVA	Anions, Alkalinit	iy,TDS 1-	500ml HD	PE	COD 1 274 TSS 1 - 1L	HDPE (ph<2)
R DPTH	PUMP	PURGE RATE	CUM. VOLUME PURGED	H20 TEMP C	SPECIFIC CONDUCTANCE	pН	ORP/Eh	D. O. mg/L	TURBIDITY NTU's	COMMENTS
11 1	117,6	250		12,18	58,00	6.7	87	8,35	15.4	
$\frac{1}{1}$	7.6	200		12,66	60,00	6,55	841	8.11	6,46	
01 1	17.6	~		14,11	66.00	6,51	8418	7,89	5,83	Flow storned
HOINGS .		-	-	~	~	-	~	-	~	NG FLOR AT All
12 13	20,5	250		15.7	64.00	6.89	80,9	7,97	7,42	Flow stoned
93 13	0.83	-		18,78	66.00	6,49	90,5	7,87		Flow stonad
87 /1	65.6	100		18,31	67.00	6.48	88.7	7.75	-	Flow stonel
	~	~	H	-		-	- 0	-	-	Backrichaller
18 11	19.8	300		19.38	67,00	6,50	82.1	8,07	3,79	Flow slower
19 11	29.3	-		22,58	69100	6.50	85.9	2,29		Flow stown Alson
196 2	86.0	-	42 gel.	1849	60.00	6147	101.5	7.62	-	BACKFlushel 2×
AT: 1210	<u> </u>		Saturated Screen	1	I	+0.1 unit	+10 mv	10%	10%	
	R DPTH # IMP feet II II II II II II II II II II II II III III III III IIII III IIII III IIII III IIII III IIII III IIII III IIII III IIII IIIII IIII III IIII III IIII III IIII IIII IIII III IIII III IIII III IIII III IIII III IIII III IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIIIIIII	R DPTH F PUMP MP feet SETTING 11 1/7.6 11 1/7.6 11 1/7.6 18 19.17,8 19.8 19.8 19.45.6 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	R DPTH # PUMP PURGE RATE IMP feet SETTING ml/min II 1/17.6 250 II 1/17.6 200 OI 1/17.6 - WINKSS - - 12 120.5 250 93 130.83 - 87 1657.6 100 18 119.8 300 79 129.3 - 0196 286.0 -	R DPTH PUMP PURGE RATE CUM/. VOLUMÉ IMP føøt SETTING mil/min PURGED II 1/7,6 250	R DPTH # PUMP PURGE RATE CUM/ VOLUME H20 IMP feet SETTING milmin PURGED TEMP C II 1/17.6 250 12.16 II 1/7.6 250 12.766 II 1/7.6 250 15.7 12 120.5 2.50 15.7 13.033 - 18.78 87 165.6 100 18.31 - - - - 18 119.8 300 19.38 19 119.8 300 19.38 19 124.3 - - 19 119.8 300 18.419 19 18.419 - - - - - - - -	R DPTH # PUMP PURGE RATE CUM/. VOLUME H20 SPECIFIC IMP feet SETTING milmin PURGED TEMP C CONDUCTANCE II 1/7,6 250 12,16 58,00 12,66 G0,00 II 1/7,6 250 12,16 58,00 12,66 G0,00 II 1/7,6 200 12,66 G0,00 10 10 III 1/7,6 250 15,7 C4/.00 12 12 120,5 250 15,7 C4/.00 12 12 120,5 2,50 1/5,7 C4/.00 18,71 67.00 18,31 67.00 130,203 -	R DPTH # PUMP PURGE RATE Cull Volumé H20 SPECIFIC pH IMP feet SETTING milimin PURGED TEMP C CONDUCTANCE pH II 1/17.6 250 12.16 58.00 6.7 II 1/17.6 200 12.66 G0.00 6.55 OI 1/17.6 - - - - 12.17.6 58.00 6.55 0.55 6.600 6.55 OI 1/17.6 - - - - - 12.12.12.05 2.50 1/5.7 64.00 6.87 - 13.12 120.5 2.50 1/5.7 64.00 6.487 13.12 120.5 2.50 1/5.7 64.00 6.497 13.19 119.8 300 1/5.78 66.00 6.497 19 119.8 300 1/5.738 67.00 6.500 19 12.19.8 300 1/5.49 60.00 6.497 19 12.49 30.00 1/5.738 67.00	R DPTH # PUMP PURGE RATE Cull Volume H20 SPECIFIC pH ORV/Eh I/I 1/17.6 25°D 12.16 58.00 6.7 87 I/I 1/17.6 25°D 12.16 58.00 6.7 87 I/I 1/17.6 20°D 12.16 58.00 6.7 87 I/I 1/17.6 20°D 12.16 58.00 6.7 87 I/I 1/17.6 1/11/1 66.00 6.55 8.4//3 I/I 1/2.0.5 2.50 1/5.7 64/.00 6.89 80.9 1/2 1/20.5 2.50 1/5.7 64/.00 6.89 80.9 1/3 1/30.203 - - - - - - 1/8 119.8 30°O 1/9.38 67.00 6.50 82.7 1/9 1.91.9 23.58 67.00 6.50 85.7 1/9 2.80.0 - 1/8.42 60.00<	R DPTH # PUMP PUMGE RATE CUM/ VOLUMÉ H20 SPECIFIC pH ORP/Eh D. 0. IMP feet SETTING milmin PURGE D TEMP C CONDUCTANCE mv mg/L I/I /////6 25°D 12/16 58/00 6/7 87 8/35 I/I /////6 25°D 12/16 58/00 6/7 87 8/35 I/I /////6 25°D 12/16 58/00 6/7 87 8/35 I/I /////6 25°D 12/18 58/00 6/7 87/4 8/1/4 I/I/I 66.00 6/57 84/18 7/87 8/35 7/97 12 120.5 2.50 1/57 64/100 6/85 80.9 7/97 31 1657.6 1/00 1/8/31 6/7.0° 6/48 88.7 7/27 18 119.8 30° 1/9/34 6/7.0° 6/50 85/7 7/27 19 124/6 30° 1/34/9 60°0° 6/97 90/15 7/67	R DPTH # PUMP PUMP PURGE RATE CUIL/ VOLUME H20 SPECIFIC DH ORPIEN D. 0. TURBIDITY I/MP feet SETTING milmin PURGED TEMP C CONDUCTANCE mv mg/L NTU's I/I I/I/1.6 QSD I/2.166 S78.00 C.77 87 8.35 /5.14/ I/I I/I/C QSD I/2.166 C0.00 C.55 84// 8.35 /5.14/ OI I/I/C 200 I/2.166 C0.00 C.55 84// 8.35 /5.14/ OI I/I/I.6 -

GWM w SCREEN	/eir# ED INTERVAL [<u>5H</u> DEPTH:	5.7-1:	diam = 2"	Ref. P.J.	US A Grou	Army andwat	Corps er Sam	of En pling Lo	gineer	S
H2O LEV	EL: PRE PUMP	INSERTION	10,92	/	PVC	Project I	Name:	Shepley's	s Hill Lar	dfill, Deve	ens, MA
	POST PUMP	INSERTION	10.91	1	7000 71	SAMPLE MET	HOD:	EPALOV	V STRESS	METHOD	
DEPTH S	AMPLED:	14'			- 223. 11	SAMPLE BOT	LES: MET	ALS/hard	nss 1 - 1L	HDPE (ph<	2)
DATE:	10/30/00	TIME:	1500		1007112	CYANIDE 1	500ml HD	PE (ph>1:	2)	VOC'S 3-	40ml VOA's (ph<
SAMPLE	D BY: SS JKPY	<u>ج</u>	SIGNATURE:	Paulyoung		Anions, Alkalini	ty, TDS 1	- 500ml H	DPE	COD 125	EHDPE (ph<2)
RECORD	ED BY: SS JK	PY)	SIGNATURE:	Paul Jourg		BOD 1 - 1L HD	PE			TSS 1 - 1L	HDPE
TIME	WATER OPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pH	ORP/Eh	D. O.	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	mi/min	PURGED	TEMP C	CONDUCTANCE	1.251	mv	mg/L	NTU's	
1416	10.95	73.7	500		11,65	415	6.32	8,6	2.04	46,0	ORANGE COLO
1421	10,95	73,7	550		13,34	417	6.28	518	1,94	26,2	woter clearing ,
1426	10.96	73,7	558		13,81	415	6.10	417	1,54	12,2	1
1431	10,96	73,7	600	300	13,77	412	6,26	415	1,22	6181	
1436	10,96	73,7	6000	0.4	13.74	408	6,28	5,7	1,05	4.40	
1491	10,97	73.7	600	Sgal	13.66	404	6.24	5,4	0,88	2,76	
1446	10,97	73.7	600		13.66	401	6.23	510	0,74	1.82	
1451	10,97	73,7	600		13,62	399	6.23	411	0,63	1,24	
1456	10.97	73.7	600	7.5 gel	13,60	399	6121	414	0,56	1,20	
				U			1		0.0		
1											
1		1-4-1		1.1	٣	1.00					
4							1		1.2.2.2.		
						1	1				
							A A				
							C				
								2			
(¥)							1	1			
						1		1			
NOTES: SAMPLE	TAKEN AT: /	500		Saturated Screen	3% Volume Req	3% uired:	+0.1 uni	: +10 mv	10%	10%	2
4											
1 I I											

DEPTH S. DATE: SAMPLET RECORD	AMPLED: 11/2/00 DBY: SS DPY ED BY: SS DPY	<u>II Føø</u> TIME: Y	SIGNATURE:	Jace A.I. Jace X	. 218.5-3 NGVD	SAMPLE BOTL CYANIDE 1 - Anions,Alkalinit BOD 1 - 1L HD	US: MET Momi HDF y,TDS 1- PE	ALS/hardn PE (ph>12 500ml HD	9176205 ss 1 - 1L F PE	HDPE (ph<2) VOC'S 3-4 COD 1 - 1 TSS 1 - 1L) 40ml VOA's (ph< - HDPE (ph<2) HDPE
TIME 24hr	WATER DPTH BELOW MP feet	PUMP	PURGE RATE	CUM. VOLUME	H20 TEMP C	SPECIFIC	рН	ORP/Eh	D. O. ma/L		COMMENTS
0925	5.56	58.7	800		12.01	129	572	91.0	-1.18	*	stialally 1
0930	5.52	58.0	600	1991	12.73	131	574	79.3	1.12	2.10	and by
5935	5.52	58.0	600	2gal	12.97	131	5.74	77.2	5.35	0.72	
0943	5.53	58.0	500	344.1	13.09	131	5.74	76.0	1.04		
0946	5.102	58.0	600	4dal	13,15	131	5.74	75.0	0.99	0.74	
0954	5.48	57.2	450	3	13.07	131	5.73	73.6	0.82		
0957	5.47	57.1	450	Saal	13.47	131	5.75	70.5	0.61	0.97	-
1002	5.48	57.2	450	3	13.47	131	5.75	69.3	2.58		
1005	5.48	57.2	450	6gail	13.50	/31	5.75	68.1	0.62	0.66	
1008	5.48	57.2	450	letz gel	13.56	13.1	5.74	66.8	0.51	0.00	
					<i>x</i>						
6											
NOTES: SAMPLE	TAKEN AT: 10	10		Saturated Screen	3% Volume Req	3% uired:	+0.1 unit	+10 mv	10%	10%	

GWM V SCREEN H2O LEV DEPTH S DATE: SAMPLE RECORE	Ven IED INTERVAL D VEL: PRE PUMP POST PUMP SAMPLED: <u>\(/2 / 20</u> D BY: SSUM PY DED BY: SSUM PY	SHM DEPTH: INSERTION INSERTION STO TIME:	-96-58 6.59 6.59 6.59 fee.t 1155 SIGNATURE SIGNATURE	dian=4 91.5 fact fact	Ref. PJ. PVC. 219.81 NGVD	US A Grou Project M SAMPLE MET SAMPLE BOT CYANIDE 1 Anions, Alkalini BOD 1 - 1L HD	Army (Name: S HOD: LES: MET LES: MET ty,TDS 1- DPE	Corps er Samp Shepley's EPA LOW ALS/hardns PE (ph>12) 500ml HDI	of Englo Hill Lan STRESS SS 1 - 1L H	gineers g Sheet dfill, Dever <u>METHOD</u> HDPE (ph<2) VOC'S 3-4 COD 1 - 4 TSS 1-1L	ns, MA 40ml VOA's (ph<2 7HDPE (ph<2) HDPE
TIME	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pH	ORP/Eh	D. O.	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	ml/min	PURGED	TEMP C	CONDUCTANCE	1	mv	mg/L	NTU's	
1207	7.20	61.0	600	-1gal	11.37	73.5	6.06	-30.6	2.2)	1.37	clear
1213	7.21	61.0	500	agai	11.50	874	6.41	-97.2	1.97	192	
1210	7.22	57.0	- 300 - Haa		11.55	827	6.51	-52.1	1.12	104	
1220	1.01	58.8	900	2.1	11.00	01/0	6.57	53.0	0.87	1.77	
1223	6.75	30.1	900	2901	1190	810	6.56	-33./		1.51	
1227	(0.7)	57.8	200	Heal	11.75	841	151	-91.6	0.00	1.5 7	
1230	7.02	598	700	7941	11.70	840	6.56	-51.7	0.10	108	
1239	1.12	31.0	100	Secl	11.01	070	6.53	-52 11	0.01	1.50	
238	1,08	37.0	130	2941	11.00	030	4.57	-579	0.01	1.55	
1242	1.02	57.8	308	7	11.87	840	0.01	57.7	0.60	0.97	
1245	7.02	59.9	200	loiz gal	11.94	840	6.58	-58.8	0.63	1.02	
1,						1					
IOTES: SAMPLE	TAKEN AT: /2	50		Saturated Screen	3% Volume Req	uired:	+0.1 unit	+10 mv	10%	10%	

153 YSI#

GWM well SCREENED INTERVAL DEPTH: H20 LEVEL: PRE PUMP INSERTION 50.3-60.3 POST PUMP INSERTION 6.06 feet DEPTH SAMPLED: 56 feet DATE: 1/2/00 TIME: //50 SAMPLED BY: \$S JKPY SIGNATURE: RECORDED BY: \$S JKPY SIGNATURE:				Ciam = 4" 0.8 fact fact cet Paul Young Paul Young	Ref. Pt. PVC ZI9.25 NGUD	US Army Corps of Engineers Groundwater Sampling Log Sheet Project Name: Shepley's Hill Landfill, Devens, MA SAMPLE METHOD: <u>EPA LOW STRESS METHOD</u> SAMPLE BOTLES: METALS/hardnss 1 - 1L HDPE (ph<2) CYANIDE 1 -500ml HDPE (ph>12) VOC'S 3 - 40ml VOA's (ph<2 Anions,Alkalinity,TDS 1- 500ml HDPE COD 1 - 4E HDPE (ph<2) BOD 1 - 1L HDPE TSS 1 - 1L HDPE						
TIME	WATER DPTH	PUMP	PURGE RATE	CUN VOLUME	H20	SPECIFIC	pН	ORP/Eh	D. O.:	TURBIDITY	COMMENTS	
24hr	BELOW MP feet	SETTING	ml/min	PURGED	TEMP C	CONDUCTANCE	-	mv	mg/L	NTU's		
1055	6,1	56.8	400		12152	294	6.54	-5/11	5.38	5,61		
1100	6.1	56.8	400		11,03	104	6138	-47.8	1186	0,86		
1105	6.1	5618	400		11,30	186	6,40	-54.3	1.14	0.58		
1110	611	56.8	700	×	11.59	822	6,39	-56.2	1,02	0.45	1. A.	
1115	6.1	56.8	400		11.64	839	6.37	-58.1	0.90	0.34		
120	6.1	56.8	400		11.63	852	6,3.7	-59.3	0.84	0.55		
1125	61	56,8	400	3 gel.	11.67	854	6137	- 59,7	0.82	0,30	-	
1130	6.1	56,8	400		11,77*	862	6.36	-60,8	0,83	0,46		
1135	6,1	56.8	400	4 gel	11.88 *	860	6,35	-6/13	0,79	0,45		
140	6.1	56,8	400	4:5gl	11.94 *	865	6,35	-61.5	0,79	0,45		
					~							
OTES: AMPLE	TAKEN AT:	1150		Saturated Screen	I 3% Volume Req	1	1 5 +0.1 uni	t +10 mv	10%	10%	I	

GWM V SCREEN H2O LEV	GWM W. SCREENED INTERVAL DEPTH: H2O LEVEL: PRE PUMP INSERTION POST PUMP INSERTION DEPTH SAMPLED: DATE: <u>II-DI-DD</u> TIME: SAMPLED BY: SS BW NM (PG)		16.3-26	diam=2" -3	Ref. Pt.	US Army Corps of Engineers Groundwater Sampling Log Sheet Project Name: Shepley's Hill Landfill, Devens, MA						
DEPTH S DATE: SAMPLE RECORI			9,91 <u>1155</u> SIGNATURE: <u>Paul Your</u> SIGNATURE: <u>Paul Your</u>		- ZZZ.84 NGVD	SAMPLE METHOD: EPA LOW STRESS METHOD SAMPLE BOTLES: METALS/hardnss 1 - 1L HDPE (ph<2) CYANIDE 1 - 1L HDPE (ph>12) VOC'S 3 - 40ml VOA's (ph- Anions,Alkalinity,TDS 1- 500ml HDPE COD 1 - 1L HDPE (ph<2) BOD 1 - 1L HDPE TSS 1 - 1L HDPE						
TIME 24br	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20 TEMP C		pH	ORP/Eh	D. O.		COMMENTS	
1125	10.13	73.7	550		11,66	11.5	6.6	-49.2	2,40	1.95		
1130	10.11	73.7	600		12,59	179	6,53	-55.5	2,54	1.43		
1135	10.12	123,7	600		12,67	184	6,53	-58.4	2,07	0,78		
1140	10.12	173.7	600		12,75	186	6.52	59,9	1.74	0.82		
1145	10.12	73,7	600		12.87	186	6149	60.8	1.54	0,79		
1150	10,12	73,7	500	4 gel	12,93	186	6.46	-62,3	1132	21.0		
			*									
					3		1	-				
			-									
NOTES:	TAKEN AT. /				3%	3%	+0.1 uni	t +10 mv	10%	10%		

YSI# 153

31.5

46

(_			<u> </u>		
GWM 🖞	brown #	Signal	US Army Corps of Engineers										
SCREEN	ED INTERVAL	DEPTH:	17.8 - 37.	6 feet	Rof Pt.	Grou	g Sheet						
120 LEV	EL: PRE PUMP	INSERTION	31.46 Real		Dire	Project Name: Shepley's Hill Landfill, Devens, MA							
	POST PUMP	INSERTION	31.46 lee	+	249.76	SAMPLE MET	HOD:	EPA LOW	STRESS	METHOD			
DEPTHS	SAMPLED:	AV-UD	SAMPLE BOT	LES: MET	ALS/hardn	ss 1 - 1L I	HDPE (ph<2)					
DATE:	0/30/00	TIME: 10	00	0. 0	1. State	CYANIDE 1-	500ml HD	PE (ph>12)	VOC'S 3-	40ml VOA's (ph<2)		
SAMPLE	D BY: 69 JK PY	. Al	SIGNATURE:	Ach		Anions, Alkalin	ity, TDS 1-	- 500ml HD	PE	COD 1 -4	HDPE (ph<2)		
RECORD	DED BY: 39 JK	PY Je	SIGNATURE:	Ab		BOD 1 - 1L HD	DPE			TSS 1 - 1L	HDPE		
TIME	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pH	ORP/Eh	D. O.	TURBIDITY	COMMENTS		
24hr	BELOW MP feet	SETTING	ml/młn	PURGED	TEMP C	CONDUCTANCE		mv	mg/L	NTU's			
1920	31.55	118.7	250		9.44	143	7.00	8.205	10.27	0.5			
19,25	31,50	120.0	600		9.69	131	6.94	212.6	9.70	1,8			
0930	31.53	120.2	500		12.84	75	7.01	224.8	10.33	2.0			
1935	31.53	120.2	500		13.20	74	6.98	239.8	10.31	2.3	1 · · · ·		
1940	31.53	120.2	500		13.61	71	6.56	253.3	10.29	2.5			
0945	31.53	120.2	500	5 20 - 2	13.66	71	696	255.1	10.25	2.0	1		
0950	31.55	120.2	550	4 gallons.	13,81	69	6.95	263.9	10.26	0,56			
0955	31.56	120.2	550	0	13.72	69	6.94	266.4	10.25	41			
1000	31.56	119.5	400		13.54	109	6.94	2.69.1	10.25	41	/ = - >0		
1005	31,53	119.5	400	Figullos	14.06	70	6.93	260.0	10.09	0.60	G		
1008	31.53	119.5	200	0	14.19	109	1.94	264.0	10.04	~1			
1011	31.48	119.5	100	5.5gallon	13.76	69	6.95	203.10	10.10	<1			
1014	31.53	169.0	200	U	13.01	68	6.92	845.9	10.10	</td <td></td>			
1013	21.53	169.0	250	V	14.90	68	6.93	264-1	9-90	</td <td></td>			
1023	31.53	169.0	200	6 Gallons	17.83	68	6.94	2.47.3	9.50	21			
1026	31.58	169.0	200	J	18.10	69	6.95	235.4	7.86	21	flow wopped of		
1029	31.53	208-8	300		17.17	68	6.95	233.0	9.87	21			
1032	31.58	118.7	300	7 cullons	17.53	69	6.94	234.7	10.05		Contraction of the second		
1.035	31.53	118.7	200	0	17.65	69.00	6.94	236.7	9.98				
1038	31.46	118.7	150		17.02	69	6.94	239.4	9,97				
NOTES:	TAKEN AT	0500		Saturated Screen	ta 4 3%	uired: 12,	% +0.1 uni	t +10 mv	+1.0	< 510%			

SWM W	Sal II	SHI	L-10 (heren	US Army Corps of Engineers							
CREENED INTERVAL DEPTH: H20 LEVEL: PRE PUMP INSERTION POST PUMP INSERTION						Groundwater Sampling Log Sheet Project Name: Shepley's Hill Landfill, Devens, MA						
						SAMPLE MET	HOD:	EPA LOW	STRESS	METHOD		
EPTH S	AMPLED:				-	SAMPLE BOT	LES: MET	ALS/hardn	ss 1 - 1L	HDPE (ph<2)		
ATE: 1	0/30/00	TIME:	and a second	VII		CYANIDE 1 -	500ml HD	PE (ph>12)	VOC'S 3-	40,ml VOA's (ph<	
AMPLE	D BY: S JK PY		SIGNATURE:	AL		Anions, Alkalini	ty, TDS 1	- 500ml HD	PE	COD 1 3	HDPE (ph<2)	
ECORD	ED BY: SJK	PY	SIGNATURE:	sh		BOD 1 - 1L HD	DPE			TSS 1 - 1L	HDPE	
TIME	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pH	ORP/Eh	D. O.	TURBIDITY	COMMENTS	
24hr	BELOW MP feet	SETTING	ml/mln	PURGED	TEMP C	CONDUCTANCE		mv	mg/L.	NTU's		
042	31.56	120.2	500	8 gel	18.17	69	6.95	239.2	9.66	<1		
0-15	31.56	120.2	500		16.41	68	6.96	242.8	9.99	51		
148	31.56	120.2	500		14.02	67	6.93	2.52.8	10.37	<1		
051	31.56	120.2	500	7 921.	13.87	67	6.93	255.4	10.38	41		
254	31.56	120.2	500		13.83	67	6.93	256.9	10.39	<1		
					-							
							-					
					-			-				
-												
					1	-						
-					-	-	-					
					-	1			-			
						-	-					
								1				
								1				
							1					
			1			11		Page 1		1000		
		1	1					1				
						-						

.
GWM V SCREEN H2O LEV DEPTH S DATE: SAMPLE RECORD	Veir ED INTERVAL I YEL: PRE PUMP POST PUMP SAMPLED: 10/30/00 D BY: SS JK PY DED BY: SS JK	SHM- 9 DEPTH: PINSERTION INSERTION <u>51 fort</u> TIME:	3- 10C <u>46 - 56</u> <u>30,32</u> <u>30,12</u> <u>1045</u> SIGNATURE: SIGNATURE:	dian=4 feet Feet for T Paulyoung Paulyoung Paulyoung	" - Ref. Pt. - PVC. - 248:42 NGVD	US A Grou Project N SAMPLE MET SAMPLE BOT CYANIDE 1 - Anions,Alkalini BOD 1 - 1L HE	Army (Name: S HOD: LES: MET Seemi HD ty,TDS 1 PE	CORPS er Samp Shepley's <u>EPA LOW</u> TALS/hardn DPE (ph>12 - 500ml HD	of En ling Lo Hill Lan STRESS ss 1 - 1L I PE	gineers g Sheet dfill, Deven <u>METHOD</u> HDPE (ph<2) VOC'S 3-4 COD 1 - 12 TSS 1-1L F	s, MA 0ml VOA's (ph< HDPE (ph<2)
TIME 24hr	WATER DPTH BELOW MP feet	PUMP	PURGE RATE	CUM. VOLUME PURGED	H20 TEMP C	SPECIFIC CONDUCTANCE	рН	ORP/Eh mv	D. O. mg/L	TURBIDITY NTU's	COMMENTS
0928	31.22	122,5	600		10.58	443.00	7,37	204.7	1,42	4,50	
0935	31,26	122.8	400		11.17	442100	7.45	19.0	1,23	7,38	
0940	31,36	122.8	350		11.86	443	7,49	182.0	1.23	5.74	
DGHS	31.4	122.8	350	C	12,26	444	7152	170.0	1.11	4,98	
0951	31.44	122.7	350		12,47	444	7153	158.5	0,93	2,85	
0955	31.45	122,8	350		12,55	445	7,53	151.0	0.95	2,66	
1000	31,48	122.8	350		12,66	445	7.53	140,6	0.91	2,10	
1005	31,5	122,8	350		12178	445	7.53	132,5	0,78	1,57	
1010	31.51	122.9	325	4gel	12,79	446	2.53	112,5	0.71	1,39	
1015	31,52	122,8	350	0.00	12,79	446	7153	75.8	0,69	1,19	
1020	31.51	122.8	350		12,81	446	7,53	6519	0.62	1,08	
1025	31.51	122,8	400		12,94	446	7,53	64.1	0,67	1,08	
1030	31,53	122.18	350		13,03	446	7,53	78,6	0.59	0,94	
1035	31,55	122,8	350		13.14	446	7,53	74,1	0.55	1,02	
1040	31.56	122.8	350	69294	13,20	447	7,53	7/17	0,53	1,00	
	9 A-										
NOTES: SAMPLE	TAKEN AT:	1045		Saturated Screer	3% Volume Red	1 6 3% quired:	1 5 +0.1 uni	t +10 mv	<u> </u> 10%	10%	

GWM v SCREEN H2O LEV	Ven IED INTERVAL D /EL: PRE PUMP	SHL- EPTH: INSERTION	<u> </u>	dian=2" 9.8 for t	Ref. Pt. PVC	US A Grou Project I	Army (Indwate Name: S	Corps er Samp Shepley's	of En oling Lo Hill Lar	gineers og Sheet odfill, Deve	S ens, MA
DEPTH S DATE: SAMPLE RECORE	POST PUMP SAMPLED: 11/1/00 D BY: SS JK(PY DED BY: SS JK(PY	1NSERTION 25 fe TIME:		failyn - Pailyn - Pailyn	236.34 NG VD	SAMPLE MET SAMPLE BOT CYANIDE 1 Anions, Alkalini BOD 1 - 1L HE	HOD: LES: MET 500ml HD ty,TDS 1- DPE	EPA LOW ALS/hardr PE (ph>12 500ml HE	7 <u>57RES</u> 1 <u>55</u> 1 - 1L 2) 0PE	HDPE (ph< VOC'S 3 COD 1 ²⁵⁴ TSS 1 - 1L	2) 40ml VOA's (ph<2) EHDPE (ph<2) HDPE
TIME 24hr	WATER DPTH BELOW MP feet	PUMP SETTING	PURGE RATE	CUM. VOLUME	H20 TEMP C	SPECIFIC CONDUCTANCE	рH	ORP/Eh mv	D. O. mg/L	TURBIDITY NTU's	COMMENTS
0532	19.07 MA	94.0	300		10.92	705	6.35	-106.1	3.32	58.3	reddish brown sed
0840	19.07	95.8	-	- 1 ×	-	-	-	-	-		YST STOPPED
	NO READINES	From C	840 +0 09	36 on purging			-				warking, out
0936	PN 19.6819.09	89.5	900		13.51	766	6,43	-68.6	3,82	6,61	
0941	A 19:69 19.1	89,5	900		14,48	775	6.43	-75.2	1183	2.87	and the second second
0946	PV 19.6619.07	87,6	300		13.86	777	6143	-70.9	1.47	-	STOPPED - BACKFlish
1002	19.07	92.5	400		14,12	765	6143	-64.2	3,34	629	
1007	19:07	92,5	400	4gel	15,33	772	6147	-66.4	2.61	2.29	
1013	19,07	9215	400	1.2.7.1	16,15	775	6.45	-67,9	2,23	1197	12
1018	19,07	92.5	400		16,21	775	6.44	-67,5	1.98	1,67	
1023	19,07	92,5	350	5gel	16.15	477	6143	-68,2	1.80	1,68	
-				<i></i>							
									2		
NOTES: SAMPLE	TAKEN AT: 10	30		Saturated Screen	3% Volume Rec	6 3% auired:	+0.1 unit	t +10 mv	10%	10%	6

YSI# 153 TURBIDITY # 75 (09 1023)

420

Pump - Grunfos Redi-flow II

OPEEN		DEPTH	17-37	fert	DIDI	Grou	indwat	er Sam	oling L c	g Sheet	
120 I FI		INSERTION	7317	Real	_ Ket. 17.	Project	Name [•]	Shenlev's	Hill an	dfill Deve	ans MA
NO LL	POST PUMP	INSERTION	20.61	2267 60	T PVC	SAMPLE MET	HOD	EPALOV	VSTDESS	METHOD	
EDTH	SAMPLED.	26 Park	1 500 + 90 30	27.010	- 241.34	SAMPLE BOT	LES ME	TAL S/hards	nee 1 . 11	HDDE (phc	2)
ATE	10/20/02	TIME	12	10	NEWS	CYANIDE 1-	Som Hr	PF (nh>1)	2	VOC'S 3.	40ml VOA's (nh<2
AMPLE	D BY: SSUK PY	18	SIGNATURE:	- 20.1		Anions Alkalini	ty TDS 1	- 500ml H)PF	COD 1 25	HDPF (ph<2)
ECOR	DED BY: SS JK	PY #	SIGNATURE:	- 2 2 -	-	BOD 1 - 1L HE	DPE	00011111		TSS 1 - 1L	HDPE
TIME	WATER OPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pH	ORP/Eh	D. O.	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	mVmin	PURGED	TEMP C	CONDUCTANCE		mv	mg/L	NTU's	
215	23.69	108.6	550	154	10.49	213	6.35	247.4	5.98	2,120	Russ Colored
220	23.69	109.0	800	2 901.	11.06	226.0	6.38	29.5	2.48	384	
225	23.69	109.1	800	3 50).	12.32	736.0	6.40	6.9	1.51	324	Generator Shupper
235	23.69	109.0	1800	4941	11.68	232.	6.39	1.8	1.32	245	Responsed
40	23.69	106.4	1000	1	12.10	232	6.36	-13.0	0.45	186	
245	23,69	106.8	1000	5 561.	12.38	233	6.35	-18.5	0.37	151	
250	23,69	106.8	900	6 gul 17mm	12:48	233	6.34	-21.5	0.30	120	
255	23.69	106 0	800	Sycl.	12.46	233	6.32	-233	0.25	52	
300	23 69	106.0	800	9 19-1	12.73	232	6.31	-241.7	0.22	35	
305	73.69	1060	800	10 901	12.71	231	6.31	-241.6	55.0	32	
310	23.69	106.0	800	11 541	12.60	230	6.25	-2-1.3	0.20	21.3	1.
315	23.69	106.0	900	12 901	12.64	229	6.27	-23.9	018	18.2	Con The Control of Con
320	23.69	106.0	900	13 gal	12.62	228	6.27	-23.7	0.17	14.3	
1325	23.69	102.0	900	15 14 gel	12.66	228	626	-23.4	0.17	12.1	
330	23.69	106.0	900	15 3011	12.62	226	6.25	-22.5	0.16	9.5	
335	23.69	106.0	900	16 961	12.62	225	6.25	-21.8	0.16	8.8	
3410	23.69	106.0	906	1700/	12.57	225	6.24	-21.5	0.15	7.9	
345	23.69	106.0	900	18 901.	12.58	225	6.24	-21.3	0.15	7. 5	
otes: Ample	TAKEN AT: 13	45		Saturated Screen	Volume Rec	o 37/3% quired:	s +0.1 uni	t +10 mv	, v2 10%	20.9	6
nel	met	Sconal		tike a	th th	ais 1	1140				

YSI# 177

GWM V SCREEN H2O LEV	ven # IED INTERVAL D /EL: PRE PUMP	EPTH: INSERTION	146-20 41.0-51.0 19.47'	dian=4" feet	Ref. Pt: PVC	US A Grou Project I	Army (undwate Name: S	Corps er Sam Shepley's	of En oling Lo Hill Lar	gineer og Sheet odfill, Deve	S ens, MA
DEPTH S DATE: SAMPLE RECORD	POST PUMP SAMPLED: 11/1/60 D BY: SS JK EY DED BY: SS JK EY	INSERTION <u>46 feet</u> TIME:	I I I I I I I I I I I I I I I I I I I	Paul Joreng Paul Joreng	- 236.84 NGVD -	SAMPLE MET SAMPLE BOT CYANIDE 1 Anions,Alkalini BOD 1 - 1L HE	HOD: LES: MET 500ml HD ity,TDS 1- DPE	EPA LOV ALS/hardr PE (ph>12 500ml HE	V <u>STRESS</u> hss 1 - 1L 2) DPE	METHOD HDPE (ph VOC'S 3 - COD 1 -4 TSS 1 - 1L	2) 40ml VOA's (ph<2) E-HDPE (ph<2) HDPE
TIME	WATER DPTH	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	pН	ORP/Eh	D. O.	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	ml/mln	PURGED	TEMP C	CONDUCTANCE	1	mv	mg/L	NTU's	
0825	19,49	95.9	400		10,97	144	6.48	12,9	2,55	1515	
0830	19.5	95,9	400		11.46	789	6,50	-8,5	1.14	9.9	
6835	19,5	75,7	400		12,24	807	6153	-13.8	0,97	9,6	NO READINGS BORWERS
0780	195	76.0	550		12,61	814	6.53	-17,5	0.85	1,83	0840 + 0855 hours
0955	19.52	76.0	650	4 gel.	12,92	8/1	6,35	-15,7	0.89	5,36	
0900	19,5	95,5	350		13,00	8/9	6,55	-15,6	0.61	4,57	
0905	19.44	95.5	250		12,10	820	6155	-21,6	0.59	2196	
0915	19,49	95,5	250	5,25gel	12,53	82/	6154	-23,5	0.61	3,54	
	•	- 1									

- 4 -

a,

.

GWM w	' с іі #	SHL-2	2	diam=4"	-	US A	rmy C	Corps	of En	gineer	S
SCREEN	ED INTERVAL [EL: PRE PUMP	DEPTH: NSERTION	106.0-114	no feet	Ref. Pt.	Project N	Name: S	hepley's	Hill Lan	g Sneet dfill, Deve	ens, MA
DEPTH S	POST PUMP AMPLED:	INSERTION	7.33'		- 2.20.45	SAMPLE METH	HOD: LES: MET.	<u>EPA LOW</u> ALS/hardn	STRESS	METHOD	2)
DATE: SAMPLE	11/1 /~	TIME:	/330 SIGNATURE:	Jana k	NG VIS	CYANIDE 1 – Anions, Alkalinit	y,TDS 1-	PE (ph>12 500ml HD) PE	VOC'S 3- COD 1 -	40ml VOA's (ph<2 E HDPE (ph<2)
RECORD	ED BY: SS 🛞	ργ	SIGNATURE: -	Jouan	-	BOD 1 - 1L HD	PE			TSS 1 - 1L	HDPE
TIME 24hr	WATER DPTH BELOW MP feet	PUMP	PURGE RATE	CUM. VOLUME	H20 TEMP C	SPECIFIC CONDUCTANCE	pН	ORP/Eh mv	D. O. mg/L	TURBIDITY NTU's	COMMENTS
1350	8.14	67.3	500	24/21	11.12	905	6.56	5.0	0.42	2.09	clear
1355	- 8.07	64.2	300	3921	11.09	906	6.77	-10.0	0.80	2.06	
1400	7.98	66.2	400	3	11.14	906	6.83	-10.3	0.99	1.63	
1404	7.98	66.2	400	4 gal	11.04	905	6.84	-7.2	0.72	1.32	
1409	7.98	662	400	20	11.03	904	6.85	1.9	0.84	1.38	generator staller
1419	7.88	66.2	400		11.03	910	6.91	-3.8	2.85	2.12	5
1423	7.92	64.2	400	5991	10.89	907	6.89	-0.3	0.90	1.68	-
1426	7.94	66.2	350	J	10.91	906	6.89	-2.1	0.83	1.90	
(429	7.94	66.2	400		10.92	904	6.90	-4.5	1.04	1.53	
1432	7.94	66.2	400	6461	10.94	904	6.90	-7.5	0.70	1.50	-
1435	7.94	64.2	350	J.	10.95	904	6.90	-7.2	0.86	1.23	
1438	7.94	46.2	400	63 gal	10.95	903	6.90	-4.1	0.93	1.30	
1								-			
~					12.23						
					20/	30/	+0.1 unit	+10 mu	10%	109/	
SAMPLE	TAKEN AT:	140		Saturated Screen	Volume Req	uired:	10.10/11	10 110	1078	1070	,
e I E								1			
134		75									

H2O LEV DEPTH S DATE: SAMPLEI RECORD	EL: PRE PUMP POST PUMP AMPLED: 11/2/00 DBY: SS JK PY ED BY: SS JK PY	INSERTION INSERTION 78 fee TIME:	7.36 fee 7.34 fee 7.34 fee 31020 SIGNATURE: SIGNATURE:	Paul young Paul young	PVC 220.27 NGVD	Project N SAMPLE MET SAMPLE BOT CYANIDE 1 Anions, Alkalini BOD 1 - 1L HD	Name: S HOD: LES: MET 600ml HD ty,TDS 1- DPE	Shepley's EPA LOW ALS/hardn PE (ph>12 500ml HD	Hill Lar <u>STRESS</u> SS 1 - 1L	Mdfill, Deve <u>S METHOD</u> HDPE (ph< VOC'S 3 COD 1 - 1 TSS 1 - 1L	ens, MA 2) 40ml VOA's (ph< HDPE (ph<2) . HDPE
TIME	WATER DPTH	PUMP	PURGE RATE		H20	SPECIFIC	pH	ORP/Eh	D. O.	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	ml/mln	PURGED	TEMP C	CONDUCTANCE		mv	mg/L	NTU's	
0900	7,36	65,3	350		10,60	865	9.40	164.8	3.74	67,8	
0905	7,36	65.8	325		10,63	880	7,33	35.6	2,11	39.4	SLIGHT ORANGE
0910	7.36	65.8	350		10,74.	897	6183	-104.3	1.93	32,1	
0915	7,36	65.8	400		10,87	902	6.70	-105.2	1.79	25,1	
0920	7,34	65.8	400		10,87	903	6.70	-108.8	1.56	19.7	
0925	7,37	65.8	400		10191	902	6.70	-109.1	1.56	18.5	
0930	7,37	6518	400	3,25 gel.	10.92	904	6.73	-113.9	1122	16,4*	10
0935	7,37	65,8	450		11.00	902	6.71	-116.2	1.11	-	
0940	7,37	65.8	450		: 11,03	906	6.72	-115,7	1.03	16,1	
0945	7,37	65,8	500	5gel.	11.07	912	6,71	-114,9	0,99		
0950	7,38	65.8	550		11.12	925	6.71	-121.7	0.93	4,86	in the second
0955	7,37	6.4.3	300		11,20	932	6.72	-122,7	0,87	-	Cowerner Pump
1000	7,37	64,3	300		11.29	935	6.73	-123,1	0,88	2,89	
1005	7.37	6413	300		11.17	941	6.70	- 122.9	0.88		
1010	7:37	64.3	350	N	11.16	940	6.70	-123.7	0.85	4173	
1015	7,37	64.3	350	7.75 gal	11.20	936	6.71	- 126,0	0.88	4,79	
IOTES:					3%	3%	+0.1 unit	+10 mv	10%	10%	

YSI # 134 TURBIDITY # 39575

Pump - Grunfos Redi-flow II

0

GWM w SCREEN H2O LEV DEPTH S DATE: SAMPLE RECORD	ED INTERVAL DE ED INTERVAL DE POST PUMP I SAMPLED: 11/1/00 D BY! SS JKOY	SHM-9 EPTH: NSERTION NSERTION 129 fee TIME:	3-22C 124-134 8.6 fe 8.6 fe 1345 SIGNATURE: SIGNATURE:	d'icin="4" feet T 7,03 Geat - - - - - - - - - - - - - - - - - - -	- Rof. Pt. - PYC - 221.55 NGVD	US A Grou Project N SAMPLE MET SAMPLE BOT CYANIDE 1 Anions,Alkalini BOD 1 - 1L HD	Indwat Name: S HOD: LES: MET LES: MET LES: MET LUCK INDE 1 DPE	Corps er Samp Shepley's EPA LOW TALS/hardr DPE (ph>12 - 500ml HD	of En bling Los Hill Lar V STRESS NSS 1 - 1L 2) DPE	Igineers og Sheet ndfill, Devens SMETHOD HDPE (ph<2) VOC'S 3-44 COD 1 24 TSS 1-1L H	s, MA 0ml VOA's (ph- HDPE (ph<2)
TIME	WATER OPTH 🐇	PUMP	PURGE RATE	CUM. VOLUME	H20	SPECIFIC	рН	ORP/Eh	D. Q.	TURBIDITY	COMMENTS
24hr	BELOW MP feet	SETTING	ml/min	PURGED	TEMP C	CONDUCTANCE		my	mg/L	NTU's	
			~13gel -	->.	1000		i				
	27,2 Dopth		,			1					
1251	27,73	115.7	300		11.3	580	7,15	-111.5	2.25	61.0	
1256	27,97	115.7	275		11.29	583	7.52	-117,1	1.03	61,0	
1301	28.1	115.7	250		11.41	577	7.60	- 119.6	0.97	61.0	
1306	28.16	115.7	250		11,45	587	7,62	-118.3	1.00	21.0	
1311	28.2	115.7	200		11.45	598	7.62	-116.8	1.05	11.0	
1316	28,23	115.7	200		11.44	603	7,62	-115,6	1.09	21.0	
1321	28,24	115,7	200		11.43	597	7.61	-1/3,8	1.11	21.0	
1326	28,25	115.7	200		11.38	611	7.61	-111.4	1,17	61,0	
1331	28.26	115.7	200		11.33	611	7,61	-108.5	1.05	21.0	
1336	28,26	115,7	200		11.30	611	7.60	-108.0	1.05	×1.0	
1341	28,26	<i> 5</i> ,7	200	NY 49 Mgul	11.28	611	7,60	- 107.5	1.01	21.0	_
	- .										
_										-4-	-
NOTES: SAMPLE	TAKEN AT: /	345		Saturated Screen	3% Volume Rec	uired:	1 +0.1 uni	t +10 mv	10%	10%	
Well A	as history of n	helpin +	no re-charg	e until drawn	down to	20 feet be	you P	<u>VC. TI</u>	nere fore	well will	be drawn

APPENDIX D

CHAIN OF CUSTODY FORMS

Computer de la Lance

Severn Trent Laboratories

208 South Park Drive, Suite 1, Colchester, VT 05446 Tel: (802) 655-120. CHAIN OF CUSTOL RECORD Report to: Invoice to Lab use only ANALYSIS Due Date: Company: US Army Curps of Engrs 160. Company: _____ REQUESTED Address: 696 Virginia Rord Address: -130 Concord: MA 01742 Temp. of coolers when received (C°): P Contact: Marie Wostes Contact: Hendman Phone: 978-318 - 8175 **Custody Seal** N/Y Phone: 310 5000 Fax: 978 - 318 - 8663 Intact N/Y PO/SO #:_____ Aners - 300 Allalinity -- 90108 Contract/ EØ 776 40C3 - 52603 Metals-60:03 Screened Sol For Radioactivity **HACH** Sampler's Name PAUL Young Sampler's Signature Jack Kieran Paulyoung < Proj. No. Project Name -JanA.K Chanide No./Type of Containers² Shepley i It.11 LTM&M E0776 BON A/G 250 Matrix' Date Time VOA P/O Lab Sample ID (Lab Use Only) 141 m X 5 W 5/8/00 1055 SHL-3 3 3 130 5/8/10/330 X 5 3 SHM-93-10C W 3 1 1 1 1 1 1 (") x 3 5 3 () 5/500/530 SHL-10 1 1 1 U 1 X TRIPBLANK 2 5/9/00 2 w Received by: (Signature) Relinquished by: (Signature) Date: Time: Time: Remarks Date: 5/8/00 5/8/00 1800 1800 Received by: (Signature) Relinquished by: (Signature) Date: Time: Date: Time: Received by; (Signeruk) Relinquished by: (Signature) Date: Time: Date: Time: Client's delivery of samples constitutes acceptance of Severn Trent 5-9-00 0945 Laboratories terms and conditions contained in the Price Schedule. C - Charcoal lube SL - Shidge O - Oil WW · Wastewater W - Water S - Soil SD'- Solid L - Llquid A - Air Bag Matrix STL cannot accept verbal changes. A/G - Amber / Or Glass 1 Liter 250 ml - Glass wide mouth P/O - Plastic or other 12 + 500 ml Please Fax written changes to VOA - 40 ml vial Container (802) 655-1248

Severn Trent Laboratories 208 South Park Drive, Suite 1, Colchester, VT 05446 Tel: (802) 655-1203

CHAIN OF CUSTODY RECORD

Report to:	Invoice	e to				AN	ALY	sis	6	1	1	1:	1	1	1	1	11	La	b use on	ily
Company: U.S. Arm Currist Rigi	Company:		_		-	Re	au	EST	ED	~	1	12	/	/)	1	11	//		c Duio,	
Address 696 Virginia Kund	Address:				_				/	0.	/	50	/	/	/	1	1			
Concord, MA 01742					-				1	5	1.	F	1	/	1	/	11	wh	np. of coo	olers ∋d (C°):
Contact: Marie Wushs	Contact:			_	2				1:		15	1	/	1	/	/	/ /	1	2 3	4 5
Phone: 978-318-8175	Phone:			_	-				2	1	X	0		1	1	/ /		Cu	stody Sea	al N/
Fax: 978 - 318 - 8663	PO/SO #:	_			_			m	Here	2	112	is	1	1	1	/	/	Inte	act	N/
$\frac{\text{Contract/}}{\text{Quote #: }} = \frac{\mathcal{D} \mathcal{D} \mathcal{D}}{\mathcal{D} \mathcal{D}}$				_				5	2/2		Tel I	1	-/~	J/	1	1	1.	Scr	eened Radioactiv	ity 🗀
Sampler's Name Skive Similar Ald 2 Juli Keenan	Sempler's Signature	-					55	601	5	300.	HAC	404	160	1	1	1	/			
EØ776 Shepley's Hill L	TMEM	No./Ty	/pe of C	Contair	ners ²		5/.	FELS	P. Y	- 54		ď.	1	/	/	/				
latrix ¹ Date Time C G o r m a Identifying Marks of p b	Sample(s)	VOA	A/G 1 LI	250 ml	P/O	5	Ž E	10	HA	10	R	K					Lab S	Sample	ID (Lab V	se Only
N 5/9/00/035 X SHL-19		3		1	5	3	1	1	1	1	1	1								1
W 5/9/00 1035 × SHL-19MS	3	3		1	2	3	1	1	1	-	-	-					-			- A
W 5/100 1035 × SHL-19ms	52	3		1	1	3	1	1	-	1	-	-								
0 5/1/10/045 × SHL-4		3	1	1	5	3	1	1	1	1	1	1		-			-			
.) 5/100/240 X SHL-11		3		2	5	3	1	1	1	ι	C	1					_			
5 51900 1255 × SHL-20	}	3		1	5	3	1	1	1	١	1	1		_	-	-				
W 5/9/00 1510 X SHL-9		3		1	5	3	1	1	1	1	1	1		1	-4	-	_			
U SIGOO - · X TRIP BLAN	K	2		~	-	2	-	-	-	-	-	-		-	- 1	_	-			
Paul Governa			11.01															_		
1 mgr y															_		1			
	1								-	_		_								
Relinevished by: (Signature) Date: T	Received by: (Signal	Bill	2.	-	Date	e:	Tin	ne:	Re	marl	(S	1								
Relinquished/by: (Signature) Date: T	ime: Received by: (Signal	ture)	0	-3	Date	e:	Tin	ne:												
Relinquished by: (Signature) Date: T	ime: Received by: (Signal	lure)	-		Pate	e;	Tin	ne:	CI	ent's	deliv	ery c	fsan	nples	cons	titutes	accept	ance of	Severn T	rent

Repor	t to:	Inv	oice to			T					1	1	T	1	11	7	TT	/Lab use	only
Company: U.S. Arm	y Corps of Engra	Company:	1				REC		STE	D /		/ /	50.	1 /		/		Due Date	9:
Address: 696 V:	rginia Row	Address:		-						1	~/		5	1	1				
Concerd	, MA 01742									1:	r)	1	S	1	11	1	11	Temp. of a	coolers
Contact: Marie	Wostas	Contact:								1	/	11	7	1	/ /	/	//	1 2	3 4 5
Phone: 978 . 318	- 8175	Phone:							1	mes	1	10		/ /	/	/ /		Custody !	Seal N/Y
Fax: 978 - 31	8-8663	PO/SO #:							/	Kug	1	3	2/		/			Intact	N/Y
Contract/ EØ7	76.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							1.	ite	5/.		2/		/ /	/	/	Screened	
Sampler's Name	Hid~	Sampler's Signature						3	0	0	11	1 1	1:	1~1	/ /	/	/	For Hadioad	cuvity
Bring White Jo	shi Keenan	Jon HA IL	~				- 3	200	00	1	2	X	20	o		11	/		
Proj. No. Project	Name	TH RAN	No./T	pe of C	Contair	ners?		1	1	15	30E	7	1	1	/				
20776 She	pley's Mill L	IMEM	-		1.5			12		1	a c	2/2	2/-			1			
atrix ¹ Date Time o r p b	Identifying Marks of	Sample(s)	VOA	A/G † Li.	250 ml	P/0	S	ma	13	P.	10	m	K	11	1	/	Lab Sa	mple ID (Lat	Use Only)
V Stille 1025 >	SHM-93-22	c l	3		1.	5	3	1	1	1	1	ı	t	E					
U 5/11/10 1030 X	SHL-22		3		1	5	3	1	(1	1	(1						E- 7
U S/11/00 1155 X	SHM-96-22	3	3		1	5	3	ı	1	1	l	۱.	1						4
5 5/11/00 1235 ×	SHM-96-56	3	3		T	5	3	l	1	1	((1						4
5/1/00 1235 >	SHM-DUP		3		1	5	3	(¢	(t	1	1						
U 5/11/00 1325 X	SHM-96-5	C	13		1	5	3	1	(\mathbf{r}	N	1	1						
1) \$11/601425 X	SHL-5	2.00	3		t	5	3	1	1	1	t	0	(
U Shilor 1440 X	SHL-EB		3		1	5	3	(1	i -	I.	t	E						
) 5/11/20 - X	TRIP BLANK	k	2		-	-	2	-	-	-	-	-	-				1		d.
Paulyon	• •				2			-	÷			-							
0 1																			
Relinquished by: (Signature	e) Date:	ime: Received by: (Signature)	10		Date	î	Tim	ne:	Re	emar	ks	-		-				
Paul Jourg	5/11/00 18	00 #81277	92056	80	5	11/0	0/	80	0	-									
relinduished by. (Signaduit		The ceived by the	Signature)			Date		100	10.										
Relinquished by: (Signature	uished by: (Signature) Date: Time: Received by: (S					Date	-	Tim		CI	ient's	s deliv	very	of sam	ples co	nstitute	es accepta	nce of Sever	n Trent
	shed by: (Signature) Date: Time: Received by: (5-12	00 0	10	ρ	La	bora	tories	s tern	ns and	conditi	ons co	ntained in	the Price Scl	hedule.

.....

Committed fo hour

Severn Trent Laboratories 208 South Park Drive, Suite 1, Colchester, VT 05446 Tel: (802) 655-1203 I La

CHAIN OF CUSTODY RECORD

			Rep	ort	to:	Invoice	e to				AN	ALY	SIS		1	1	1	I	/	1	11	1	Lab	use only	,	
Co	mpar	y:US	Ace	uq C	ops of Engineers	Company:				-	RE	QUE	ESTE	D	12		16.	1	1	1		1		Dale.		
A	ddres	s: 6	16 1	ing	inia Road	Address:	_							1	1	/	X	1	/	/	1	11	1			-
		Co	-	rd,	MA 01742					_				1	The second	1	F	1	/	/	11	//	Tem	o. of cool received	ers I (C):	
¢	onta	ct: Ma	rie	n	litas	Contact:	_	-						1.	tare	1	7	/	/	/ /	/ /	/	1	s 3	4 5	ń
	Phor	ie: 97	8-	318	-8175	Phone:	_							1	7	m	1		1	1	/	/	Cust	ody Seal	N/1	1
C	Fa	x: 9	8- d	318	- 8663	PO/SO #:				-			89	(eglo)	03	tring	10		/	/	1	/	Intac	ned.	N/1	1
Sam	No. Project Name				ampler's Signature						83	1	10	101 0	CH O		14	1	-	//		For R	adioactivity	,		
Proj.	No.	16	Proj	eci N	ame Inn's Hill LTh	n+M	No./T	/pe of C	Contain	ers²		-y	met	ride	1.30	HH	407	160	/	/	/					
Valrix'	Date	Time	COED	Grab	Identifying Marks of S	ample(s)	VOA	A/G 1 Lt	250 ml	P/0	2		20	A.	Tel In	Ban	YF	Y	/	/ /	/	Lab Sa	Imple IC) (Lab Us	e Only)	00
W	10/20/2	1055		×	SHL-10		3			6	3	I.	1	1	1	1	4									-
W	×3.42	1045		×	SHM-93-100	5	3		111	6	3	1	j.	J	1	1	1									
N	0/34	1310		X	SHL-3		3			6	3	1	1	1	1	1	1									T
N	10/30/0	1245		X	SITL-19- 000	<u>y</u> ~	3			6	3	1	1	1	1	1	1									
N	5150120	345		X	5 HL-19-m.5		3		File	3	3	X	1	1												Ì
N	iolsola	1345		X	54-19-msr	2	3	121		2	3	1	1									_			_	1
W	istatic'	1500		X	546-4		3	11.4		6	З	1	1	1	1	1	1									Ĩ
w	1213210	,VA	6	X	Tr. 2 Blank	6	1				1															2
	1×	>	/													2			-	-		_				
_	-	Ļ	-	-			1	-				-			<u> </u>	-			-1	-	<u>e</u> le					-
Rejin	guishe	d by: (Signa	ture)	Date: Tin	ne: Received by: (Signation)	ature)			Date		Tir	ne:	R	emarl	s		-			-					-
Relin	inquished by: (Signature) Date: Time: Received by: (Signature)				ature)		9	Date	:	Tìr	ne:															
Relin	nquished by: (Signature) Date: Time: Received by: (Signature)				ature)	-	10	Date	Hop	Tir O	ne: 13		lient's abora	deliv	ery of term	of sam Is and	ples o	consti litions	tutes a contai	cceptar ned in I	nce of S the Price	evern Tre e Schedu	nt e.			
* M. Cu	lnx nbor e	Quished by: (Signature) Date: Time: Received by: (Signature) IVX WW Wastewater W Water S - Soil SD Solid 1 Ibit HT VOA 40 ml vial A/G - Amber / Or Glass 1 Liter 250				S - Soil SD Solid 1 - Or Glass 1 Liter 250 m	Liquid I - Glass	A wide	nout!	1	C · 0	Plan	soal tu	ube r oth	Sl er 2 5	Shic	ige 1, 5.	U U M CC),12		STL ca Plea	annot a ase Fax	writte	I change	anges. s to	

Report to:	Invoid	e to				AN	ALY	SIS		1.	J	1	11	1	11	1	Lab use only	
Company: US Army Corps of Engineer	Company:				_	RE	QUE	STE	D/	0	1 1	0		1	/ /	//	Due Date:	
Address: 696 Virginia Road	Address:	_	_						1	7	/	-16	/	//	/	11	-	
Concord, MA 01742					_				1.	3	11	A	/ /	1	1	/ /	Temp. of coolers when received (C):
Contact: Marie heitas	Contact:				_				14		13	1		/	11	/	1 2 3 4	5
Phone: 978-318 - 8175	Phone:				- 1			1	00/	41	7	/		11	1	/	Custody Seal	N/
Fax: 978 - 318 - 8663	PO/SO #:				_			2	010	_	A	1	/	/ /	/	/	Intact	N/
Contract/ Quote #: $\vec{E} \phi 776$								0	9	3	11 al	/	11	//	11	/	Screened For Radioactivity	
Sampler's Name Aulyon	Sampler's Signature						2	12	30	Bu	2005	1.		1	11			-
Jack Keenan Joew.).	in	-					1	et	1	00	3	3	2.7	11	/			
Proj. No. Project Name	m+n	No./T)	pe of C	Contair	iers ²		-1/	2	ide	7	H	7	7	11	/			
C G		-	1	050		3		2	Jar.	50	3/ <	1.	1/		/			
atrix' Date Time O r a Identifying Marks	of Sample(s)	VOA	A/G 1 LL	250 ml	P/O	1	1	10	1	10	18	1F		1	/	Lab Sar	nple ID (Lab Use (Only)
NII.01.00 0920 × SHL20		3			6	3	ł	1	A.	1	1	1						
V HOICE 1030 X SHLII		3			6	3	1	1	1	1	1	1						
N 11-0121155 X SHL9		3			6	3	1	1	1	1	1	1				-		
V 11-01201345 X SHM-93-	220	3	11		6	3	1	1	1	1	1	1		1				
V 11-01-0214-16 X SHL22		3			6	3	i.	1	1	1	1	1						
X Trip B	lank	1				1				E.U								
											int.							
1 WW		1																
James I I I I I I I I I I I I I I I I I I I		-																
				4														
									-	1								
Relinquished by: (Signature) Date:	Time: Received by (Sign	nature)			Date	c ,	Tin	ne:	Re	emarl	ks							
Faithurne Whitten 11-01-00	550 FEDEX SI	2779	2057	16		-	-											
Heimquished by: (Signature) Date:	Time: Received by: (Sig	nature)			Date	1	Tin	ne:										
Relinquished by: (Signature) Date:	Time: Received by: (Sig	nature)			Date	e r	Tìn	ne:	CI	ient's	deliv	ery o	f samp	es cons	stitutes	acceptan	ce of Severn Tren	ŧ
	lone GL			11	-2-1	00 0	PR	2	La	bora	tories	term	s and c	ondition	ns conta	ained in t	ne Price Schedule	2

Severn Trent Laboratories 208 South Park Drive, Suite 1, Colchester, VT 05446 Tel: (802) 655-1203 1 and

CHAIN OF CUSTODY RECORD

Report to:	Invoic	e to				AN	ALY	SIS		1	1	1	7	1	7	11	/Lab us	se only	
Company: US Army Corps of Engineers	Company:			-	5	RE	QUE	STE	D	/ 5	1 /	110	7 /	1	/	/ /		ale.	
Address: 646 Virginia Road	Address:								/	3	/	S		/	/ /		/	-	_
Concord, MA 01742									/	7	/	Ħ	1	/		11	Temp. o when re	of coolers eceived (C):	
Contact: Marie Woitas	Contact:								1 -	Par la	1	f	1	/ /		11	1 2	3 4	5
Phone: 978-318-8175	Phone.							1	T	¥	17		/ /	/	/	/ /	Custod	ly Seal N	/ Y
Env: 978-318-8463	PO/SO #:				_			/	0	1	t.	1/	/	1	1	/ /	Intact	N	/Y
Contract/ Quote #: Ed 776	10/30 #							w.	0100	3	1.4.	8	/	/			Screene	d F	
Sampler's Name	Sampler's Signature							9	10	/ 3	* 4	9 _	1 -1	1	/	1	For Hadi		-
Jack Vieran 7	Paulton						N	1 1	1,1	0	EX	1	3	/	1	/			
Proj. No. Project Name	1J. /	No./Ty	pe of C	Containe	ers?		1	1th	J	3	HA	40	le	1	11	/			
E\$776 Shepley's Hill L	TM + M		_				5/	5	s	7	1	1/1	:/	/ /	/ /				
Matrix Date Time C G T Identifying Marks of	Sample(s)	VOA	A/G 1 LI	250 ml	P/O	20	F		P.		Ban	TK	1/			Lab S	Sample ID (l	Lab Use Only	»d
W 11-02-00 1020 X SHM-96	-22B	3			6	3	1	J.	1	1	4	1							d
W 11.02.W1010 X SHL5		3			6	3	ł	1	1	1		1							
W HOLD 1150 X SHM-96-	5C	3			6	3	1	1	1	L	1	1							
W 103-10 1250 X SHM.96-	5B	3			6	3	X	1	1	1	1	1							
WINDER 1250 X SHLDUP		3			6	3	1	1	1	(1	1							
WINDER HOW X SHIEB		3			6	3	N	I	A	1	1	1		3					-
WHERE X Trip Pla	nK	1				1									1111				
Line Line Line Line Line Line Line Line		-																	
J. Winner		1			111														
3												1	1						
							-					_			-				
Relinguished by: (Signature) Date: T	ime: Received by: (Sign	ature) A	10:11	+ 1	Date	R	Tin	ne:	Re	emar	KS								-
Katherine miller 11.02.00 14	30 FEDEX	570	5	1													1		
Aelinquished by: (Signature) Date: T	ature)	42	- 11	Date		Tin 101	ne: 5			2	. (2.00	lei	rs	shi	<i>ppecl</i>			
Relinquished by: (Signature) Date: 7	quished by: (Signature) Date: Time: Received by: (Sig				Date		Tin	ne:	CI	ient's abora	deliv tories	ery c term	l samp s and	oles co condit	onstitut tions co	es accept	ance of Sev the Price S	ern Trent Schedule.	
Mattix WW Wastewater W Water Camfarrer VOA 40 mt vial A/G Ambe	S - Soit SD - Solid L - (7 Or Glass 1 Liter 250 m	Liquid I - Glass	A . s wide	niouth	1	C · C P/O	Plas		ibe r othr	SI 17 2 1	Slud	lge 1, 3	0 (mml)	11	SI	L cannot Please Fa	accept v ax written . 802) 655-12	changes anges to	6

APPENDIX E

COMPARISON OF ARSENIC RESULTS

SHEPLEY'S HILL LANDFILL GROUNDWATER MONITORING HISTORIC ARSENIC CONCENTRATION CHARTS (CLEANUP LEVEL = 50 ug/l)



NOTES:

NS: Not Sampled ND: Not Detected .

SHEPLEY'S HILL LANDFILL GROUNDWATER MONITORING HISTORIC ARSENIC CONCENTRATIONS CHARTS (CLEANUP LEVEL = 50 ug/l)



.

NOTES: NS: Not Sampled ND: Not Detected

APPENDIX F

QUALITY ASSURANCE REPORTS

Chemical Data Quality Assurance Report 2000

.

э.

÷

NEW ENGLAND DISTRICT - GEOTECHNICAL & WATER MANAGEMENT BRANCH CHEMICAL DATA QUALITY ASSESSMENT REPORT

Shepley's Hill Landfill, Long Term Groundwater Monitoring
(Samples collected May and November 2000)
Devens, MA
Chemical Quality Assurance Report No. E766-092600, dated 26
September 2000 and No. E766-041301, dated 13 April 20001
New England District, US Army Corps of Engineers, Concord, MA
Marie Wojtas, project chemist, CENAE-EP-HC
17 May 2001

The Chemical Quality Assurance Reports (CQAR) No. E0766-092600 and E0766-041301 for the long term groundwater monitoring project at Shepley's Hill Landfill, Devens, MA were reviewed. The following comments apply to the overall data assessment for two field sampling events which occurred in May and November 2000. The CQARs include comparison of two groundwater samples (one from each sampling event) analyzed for Volatile Organic Compounds (VOCs), Total Metals, Cyanide, Anions, Chemical Oxygen Demand, Biological Oxygen Demand, Alkalinity, Hardness, Total Dissolved Solids, and Total Suspended Solids.

1. <u>Data Useability</u>: The primary laboratory and quality assurance (QA) laboratory data show adequate comparability. The primary laboratory data is useable for the intended purpose. The project objective for this data is for long term groundwater monitoring purposes, and data is compared to the Record of Decision (ROD) and other associated regulatory cleanup goals. The primary contaminant of concern at this site is Arsenic. The QA laboratory data support the primary laboratory data which was used by USACE-NAE to prepare the annual and semi-annual groundwater analytical reports.

2. <u>Data Quality Objectives (DQOs</u>): DQOs for the project have been satisfied. The following paragraphs summarize the most significant data comparability issues. No immediate corrective action is necessary for these items. Future sampling events will continue to be compared to QA laboratory data to verify the accuracy of the primary laboratory data, as described below.

a. <u>Metals Analysis – Data Discrepancies</u>: There are one major (chromium) and four minor (two for thallium, one for selenium, and one for zinc) data discrepancies for Metals. In all cases, both laboratories are reporting values which are significantly below the cleanup goal (where one exists). Therefore, these discrepancies are not considered to be significant, but will continue to be monitored for future sampling events.

<u>Corrective Action</u>: The data discrepancies noted are not considered to significantly impact the data interpretation, but will continue to be monitored for future sampling events.

NEW ENGLAND DISTRICT - GEOTECHNICAL & WATER MANAGEMENT BRANCH CHEMICAL DATA QUALITY ASSESSMENT REPORT

b. <u>Chemical Oxygen Demand (COD) Analysis – Data Discrepancies</u>: There is one minor data discrepancy for COD for the samples collected in November 2000. The contract laboratory results are lower than reported in the May 2000 sampling round. There is no associated regulatory standard for COD and the discrepancy is not considered to significantly impact the data interpretation.

<u>Corrective Action</u>: The discrepancy is noted, and will continue to be monitored for future sampling events.

3. <u>Contract Compliance</u>: The primary laboratory met contractual obligations for this project. The QA laboratory met most contractual obligations except that they reported a slightly different target analyte list for metals than requested. This will be corrected for future sampling events. Overall, the primary and QA laboratory results compare satisfactorily, and the results obtained from the May and November 2000 sampling events are consistent and reasonable. Both laboratories reported satisfactory supporting quality control data. Chemical Quality Assurance Report Spring 2000

20

•

Ô.

.

SHEPLEY'S HILL LANDFILL LONG TERM MONITORING DEVENS, MASSACHUSETTS

CHEMICAL QUALITY ASSURANCE REPORT No. E0776-092600

May 11, 2000 SAMPLING EVENT

PREPARED BY THE ENVIRONMENTAL ENGINEERING AND GEOLOGY SECTION ENGINEERING/PLANNING DIVISION

DEPARTMENT OF THE ARMY NEW ENGLAND DISTRICT, CORPS OF ENGINEERS CONCORD, MASSACHUSETTS

SEPTEMBER 26, 2000

SHEPLEY'S HILL LANDFILL LONG TERM MONITORING DEVENS, MASSACHUSETTS MAY 11, 2000 SAMPLING EVENT

CHEMICAL QUALITY ASSURANCE REPORT No. E0776-092600

TABLE OF CONTENTS

Paragraph	Title	Page
	Executive Summary	1-2
	Table 1- Data Comparison Summary	3
	Table 2 - Analyses Performed by QA Laboratory	4
1.	QA sample shipping and chain-of-custody deficiencies	5
2.	Data comparison for volatiles by Method 8260	5-6
3.	Data comparison for metals by Method 6010 and 7470	6-7
4.	Data comparison for cyanide by Method 9010B	7
5.	Data comparison for anions by Method 300.0	7-8
6.	Data comparison for COD and BOD by Method 410.4 and 405.1	8
7.	Data comparison for alkalinity by Method 310.1	8
8.	Data comparison for hardness by Method 130.2	8-9
9.	Data comparison for TDS and TSS by Methods 160.1 and 160.2	9
10.	References	9
	Appendix A - Key to comments on Data Comparison Code	
	Appendix B - Data Comparison Tables	
	Appendix C - Custody Documentation	

SHEPLEY'S HILL LANDFILL LONG TERM MONITORING DEVENS, MASSACHUSETTS MAY 11, 2000 SAMPLING EVENT

CHEMICAL QUALITY ASSURANCE REPORT No. E0776-021100

Executive Summary

QA samples from one shipment for Shepley's Hill Landfill Long Term Monitoring, Devens, Massachusetts were analyzed by the QA laboratory, resulting in a total of 76 target analyte determinations. The shipment contained two QA water samples and was received in good condition. The data report from STL (Severn Trent Laboratories), dated 15 June 2000 was used in the comparison. In 31 of these determinations analytes were detected by one or both laboratories. Results from the analysis of QA samples were compared with results from analysis of the corresponding primary samples (Reference 10A). The primary and QA samples agreed overall in 73 out of 76 (96.0%) of the comparisons. Primary and QA samples agreed quantitatively in 28 out of 31 (90.3%) of the comparisons. Quantitative agreement represents only those determinations where an analyte was detected by at least one laboratory. One major and two minor discrepancies between results from the primary and QA samples were noted. Refer to Table 1 for a QA split sample data comparison summary.

The QA laboratory's data report was evaluated based on the information that was provided. All of the data comparisons for Methods VOA's-8260, TAL Metals-6010, CN, Anions, COD, BOD, Alkalinity, Hardness and TDS were in good overall and quantitative agreement. There were only three data discrepancies noted for metals. All the other quantitative results compared almost identically for all of the target analytes that were reported as hits. There was very little bias to any of the sample results and the data appears to be complete and useable. There was one major discrepancy for the chromium result in which the QA laboratory reported 1.1 B ug/L and the primary laboratory reported 4.0 B ug/L. Based on the evaluation of both laboratory's QC data, no reasonable explanation can be offered for this major discrepancy.

The primary laboratory's data report was evaluated based on the information that was provided. As stated above, all of the data comparisons for the majority of the analyses were in good overall and quantitative agreement. The rest of the sample results for all of the analyses were supported by the QC data and appear to be complete and useable. The QA laboratory's reporting limits for volatiles was approximately five times lower than the primary laboratory's volatile reporting limits. Both laboratories should be given a specific target analyte list for metals so they are both analyzing the same metals. The primary laboratory reported the samples in which tentatively identified compounds (TIC's) were detected, but did not specify their possible identification or the number of TIC's detected in each sample. This CQAR is based on the laboratory reporting limits because the detection limits were not provided. QA analyses were performed by Quanterra Environment, Services, 880 Riverside Parkway, West Sacramento, CA, 95605 and CLS Labs, 3249 Fitzgerald Road, Rancho Cordova, CA, 95742 (see Table 2 for analyses performed by the QA lab). The primary laboratory was Severn Trent Laboratories, 55 South Park Drive, Colchester, VT, 05446.

<u>Table 1</u> <u>Quality Assurance Split Sample</u> Data Comparison Summary

	Overall		Quantitati	ve
	Agreement	t (1)	Agreemen	nt (2)
Test				
Parameter	Number	Percent	Number	Percent
VOC	47/47	100	8/8	100
METALS	15/18	83.3	12/15	80.0
CYANIDE	1/1	100	NA	NA
ANIONS	4/4	100	3/3	100
COD	1/1	100	1/1	100
BOD	1/1	100	NA	NA
ALKALINITY	1/1	100	1/1	100
HARDNESS	1/1	100	1/1	100
TDS	1/1	100	1/1	100
TSS	1/1	100	1/1	0
Total	73/76	96.0	28/31	90.3

Project: Shepley's Hill Landfill Long Term Monitoring, Devens, Massachusetts, November 2, 1999 Sampling Event

NOTES:

(1) Represents the number and percentage agreement of all determinations including analytes not detected by either laboratory.

(2) Represents the number and percentage agreement of only those determinations where an analyte was detected by at least one laboratory.

TABLE 2

QA ANALYSES PERFORMED

SAMPLE ID	MATRIX	SAMPLE DATE	ANALYSIS
SHM-96-5B-QA	WATER	5-11-00	VOC,METALS,CN, ANIONS,COD,BOD,ALK, HARDNESS,TDS,TSS
TRIP BLANK	WATER	5-11-00	VOC

.

ŝ

÷

.

.

SHEPLEY'S HILL LANDFILL LONG TERM MONITORING DEVENS, MASSACHUSETTS MAY 11, 2000 SAMPLING EVENT

CHEMICAL QUALITY ASSURANCE REPORT No. E0776-092600

QA Findings

1. QA sample shipping and chain-of-custody deficiencies.

One shipment containing two QA water samples was received by Quanterra Environmental Services, West Sacramento, CA, on 12 May 2000. Proper sample handling protocols were followed for this shipment.

A copy of the chain-of-custody form document and cooler receipt form is appended to this report for reference.

2. Data comparison for volatiles (VOC) by Method 8260.

There were 47 volatile determinations. In seven of these determinations, target analytes were detected by one or both laboratories. There was overall agreement in 47 (100%) of the cases and quantitative agreement in eight out of eight (100%) of the cases. No major or minor data discrepancy was noted.

The QA laboratory's QC samples were within the acceptance limits for all of the target analytes and a complete evaluation was performed. The method blank and the trip blank were free of contamination above the laboratory's reporting limit for all of the target analytes, except for 1,2,3-trichlorobenzene at 0.16 J ug/L in the trip blank and acetone at 1.3 J ug/L in the method blank. All of the samples, LCS/LCSD's, method blank, and trip blank surrogates recoveries were within the laboratory's acceptance limits. All of the LCS/LCSD's target analytes were also within the acceptance limits for accuracy and precision. The QA laboratory only spiked five of the target analytes into the LCS/LCSD. The QA laboratory was not requested to perform MS/MSD's and no evaluation of accuracy and precision due to matrix effects could be determined. All of the samples were analyzed within the required holding times. The QA laboratory's reporting limits were approximately five times lower than the primary laboratory.

The primary laboratory's QC samples contained all the necessary information and a complete evaluation was performed. The method blanks and the trip blanks were free of contamination above the laboratory reporting limit for all of the target analytes. The surrogates for both the samples and the laboratory's QC samples were all within the acceptance limits. The primary laboratory reported that the MS/MSD's performed on sample MW-SHL-19-00 were

within the acceptance limits for all 84-target analytes for precision and 23 out of 168 target analytes recoveries were outside the acceptance limits for accuracy. All of the target analytes in the LCS's were recovered within the acceptance limits, except in zero out of 84 of the cases, five out of the 84 cases and five out of the 84 cases, for the three respective LCS's analyzed. All of the LCS outages were recovered above the acceptance limits. All of the samples were analyzed within the required holding times.

The primary laboratory was also requested by the USACE project chemist, Marie Wojtas, to report the number of tentatively identified compounds (TIC's) found in each sample and report the findings in the case narrative. The primary laboratory reported that TIC's were detected in the following samples: SHM-93-10C, SHL-10, SHL-20, SHM-93-22C, SHL-22, SHM-96-22B, SHM-96-5B, SHM-DUP, SSHM-96-5C, SHL-5, SHM-99-32X, and SHM-99-31C. Sample SHM-96-5B was also the QA sample. The number of TIC's that were in each sample and their possible identification were not discussed in the case narrative.

3. Data comparison for TAL metals by Method 6010 and mercury by Method 7470.

There were 18 metals determinations. In 15 of these determinations, target analytes were detected by one or both laboratories. There was overall agreement in 15 (83.3%) of the cases and quantitative agreement in 12 out of 15 (80.0%) of the cases. One major and two minor data discrepancies were noted.

The major data discrepancy occurred in sample SHM-96-5B-QA-00 in which the QA laboratory reported chromium at 1.1 B ug/L and the primary laboratory reported 4.0 B ug/L. The first minor discrepancy occurred in sample SHM-96-5B-QA-00 in which the QA laboratory reported thallium at < 10.0 ug/L and the primary laboratory reported 27.2 ug/L. The second minor discrepancy occurred in sample SHM-96-5B-QA-00 in which the QA laboratory reported zinc at 8.2 B ug/L and the primary laboratory reported 3.6 B ug/L.

The primary laboratory's QC data report contained all of the necessary QC information and a complete evaluation was performed. The method blanks were free of contamination above the reporting limit for all of the target analytes. The primary laboratory reported that the LCS recoveries were within the acceptance limits for all of the target analytes. The primary laboratory performed a matrix spike and a matrix duplicate on sample SHL-19-00. The matrix spike recoveries were all within the acceptance limits of 75-125%, except for barium and copper. All of the spike levels, percent recoveries and QC limits were appropriately indicated on all of the QC reports. All of the samples were analyzed within the required holding times.

The QA laboratory's QC data were within the acceptance limits for all the target analytes and a complete evaluation was performed. The method blanks were free of contamination above the reporting limits. The QA laboratory reported that the LCS/LCSD's were within the acceptance limits for both accuracy and precision. All of the spike levels, percent recoveries and QC limits were appropriately indicated on all of the QC reports. The QA laboratory reported all of the metals were analyzed by Method 6010 Trace-ICP, except for mercury, which was analyzed for by Method 7470-Hg Cold Vapor. All of the samples were analyzed within the required holding times.

4. Data comparison for total cyanide by Method 9010B.

There was one cyanide determination. There was 100% overall agreement in that cyanide was not detected by either laboratory. No major or minor data discrepancies were noted.

The primary laboratory's QC data were within the acceptance limits for cyanide and a complete evaluation was performed. The method blank was free of contamination above the laboratory's reporting limit. The LCS's recovery was not reported. The matrix spike was recovered within the acceptance limits at 102.0%. The matrix duplicate and the original sample were reported below the laboratory's reporting limit. The sample was analyzed within the required holding time.

All of the QA laboratory's QC data were within acceptance limits and a complete evaluation was performed. The method blank was free of contamination above the laboratory's reporting limit. The LCS/LCSD's were within the acceptance limits for both accuracy and precision. The QA laboratory analyzed the sample by modified Method 9012A, instead of Method 9010B as indicated on the chain of custody. The sample was analyzed within the required holding time.

5. The data comparison for anions by Method 300.0.

There were four anion determinations. In two of these determinations, target analytes were detected by one or both laboratories. There was overall agreement in four (100%) of the cases and quantitative agreement in two out of two (100%) of the cases. No major or minor data discrepancies were noted.

The QA laboratory's QC data were all within the acceptance limits and a complete evaluation was performed. The method blanks were free of contamination above the reporting limit for all of the target analytes. The LCS was within the acceptance limits for all of the target analytes for both accuracy and precision and the spiking levels were also indicated. The QA laboratory was not requested to perform a MS/MSD on any of the samples and no evaluation of accuracy or precision based on matrix effects could be made. All of the samples were analyzed within the required holding times.

The primary laboratory's QC data were all within the acceptance limits and a complete evaluation was performed. The method blanks were free of contamination above the reporting limit for all of the target analytes. The LCS recoveries were within the acceptance limits. The primary laboratory reported that the matrix spike and the matrix duplicate appeared to be within the laboratory's acceptance limits, but no QC limits were provided. All of the samples were analyzed within the required holding times.

6. Data comparison for COD by Method 410.4 and BOD by Method 405.1.

There was one COD and one BOD determination. In both the COD and BOD determinations, there was 100% overall and quantitative agreement. There were no major or minor data discrepancies noted.

The primary laboratory's QC samples were within the acceptance limits for all of the target analytes and a complete evaluation was performed. The method blank was free of contamination for both the COD and BOD results above the laboratory's reporting limit. The LCS recoveries for COD and BOD were both within the laboratory's acceptance limits. The primary laboratory did not report any MS/MSD's results. The samples were analyzed within the required holding times.

The QA laboratory's QC samples were within the acceptance limits for all of the target analytes and a complete evaluation was performed. The method blank was free of contamination above the reporting limit. The LCS/LCSD's for COD were within the acceptance limits for both accuracy and precision. The QA sample was analyzed within the required holding times of 48 hours. The QA laboratory's contracted lab (CLS Labs) performed the BOD analysis. The method blank, LCS and duplicate were all within the acceptance limits.

7. The data comparison for alkalinity by Method 310.1.

There was one alkalinity determination. In this determination, there was 100% overall and 100% quantitative agreement. No major or minor discrepancies were noted.

The QA laboratory's QC samples were within the acceptance limit for alkalinity and a complete evaluation was performed. The method blank was free of contamination above the reporting limit. The QA laboratory reported that the LCS/LCSD's were within the acceptance limits for both accuracy and precision. There were no MS/MSD's performed for alkalinity and no evaluation of matrix effects could be determined. All of the samples were analyzed within the required holding times.

The primary laboratory's QC samples were all within the acceptance limit for alkalinity and a complete evaluation was performed. The method blank was free of contamination above the reporting limit. The primary laboratory reported that the LCS's were within the acceptance limits. The primary laboratory reported that the duplicate and the matrix spike results were within the QC limits. All of the samples were analyzed within the required holding times.

8. Data comparison for total hardness by Method 130.2.

There was one hardness determination. In this determination, there was 100% overall and 100% quantitative agreement. No major or minor discrepancies were noted.

The QA laboratory's QC samples were within the acceptance limit for hardness and a complete evaluation was performed. The method blank was free of contamination above the laboratory's reporting limit. The QA laboratory reported that the LCS/LCSD's were within the laboratory's acceptance limits for both accuracy and precision. All of the samples were analyzed within the required holding times.

The primary laboratory's QC samples were within the acceptance limit for total hardness and a complete evaluation was performed. The method blank was free of contamination above the reporting limit. The primary laboratory reported that the LCS was within the laboratory's acceptance limits. The primary laboratory reported that the duplicate and matrix spike were within the QC limits.

9. Data comparison for TDS by Method 160.1 and TSS by Method 160.2.

There was one TDS and one TSS determination. In the TDS determination, there was 100% overall and quantitative agreement. No major or minor data discrepancies were reported. In the TSS determination, there was 100% overall and quantitative agreement. No data discrepancies were noted.

The primary laboratory's QC samples were within the acceptance limits for all of the target analytes and a complete evaluation was performed. The method blanks for TDS and TSS were free of contamination above the laboratory's reporting limits. The LCS recoveries for TDS and TSS were both within the laboratory's acceptance limits. The primary laboratory did not report any MS/MSD sample results, but the duplicate was within the QC limits. The samples were analyzed within the required holding times.

The QA laboratory's QC data were within the acceptance limits for all of the target analytes and a complete evaluation was performed. The method blanks for TDS and TSS were free of contamination above the laboratory's reporting limits. The LCS/LCSD's were within the acceptance limits for both accuracy and precision. All of the samples were analyzed within the required holding times.

10. References.

a. Data Report for Shepley's Hill Landfill Long Term Monitoring, Devens, Massachusetts, prepared by Severn Trent Laboratories, dated 15 June 2000.

b. EM 200-1-6, Chemical Quality Assurance for Hazardous, Toxic and Radioactive Waste (HTRW) Projects, dated 10 October 1997.

		COMPARIS	SON OF Q	A & CON	TRACTOR	R RESULT	rs	Page 1 c	f 2
1		PROJECT:	SHEPLE	Y'S HILL	LANDFILL	, SPRING	2000		
					-				
-1				-				1	1
DA SAMPLENO-	G0E120203	-001		CC	NTPACT	MASSAG	PIE No -	417777	
OA FIELD ID	SHM-96-SF	LOA	-		CONTRA	CTORSE	IFLD ID	SHM-96	-SR
DA ANALYSIS DATE	5/23/00			CONTR	ACTOR'S	ANALYSI	S DATE:	5/17/00	1
QA LABORATORY:	QUANTER	RA		CONT	RACTOR	S LABOR	ATORY:	STL, VT	
RACTION METHOD	5030B		1	1	EXTRA	CTION M	ETHOD:	5030B	
ANALYSIS METHOD:	:8260B	10000			AN	LYSIS M	ETHOD:	18260B	
1									
		1.							
1	MATE	RIAL DESCR	UPTION:	WATER			-		1
1		DATESA	MPLED:	5/11/00					
			UNITS:	ug/L					
		-							
		1				-			
	I		RESULTS	1		1	RESULTS	C	OMPARISON
PARAMETER	QALAB		QA LAB	CC	NTRACTO	DR CO	NTRACTOR		CODE
	LRL				LRL				
						-			
Dichlorodifluorometh	ane < 1.0		1		< 5.0				0
Chloromethane	< 1.0		0.61 1		< 5.0	-			0
Vinyi Chloride	1 -10		U.03 J		< 5.0		-		0
Chloroethane	1 ~ 1.0		28	-	~ 3.0		301		0
Trichlorofluoromethar	< 1.0	-	2.0		< 5.0		3.03		0
Acrolein	NR				< 5.0				2
Freon TF	NR			1	< 5.0				2
1,1-Dichloroethene	< 1.0				< 5.0				0
Acetone	< 2.0	1			< 5.0				0
Methyl Iodide	NR				< 5.0				2
Carbon Disulfide	i NR				< 5.0				2
Allyl Chloride	NR				< 5.0	-			2
Methylene Chloride	<1.0				< 5.0	-	-		0
Acrylonitrite					< 5.0				0
1.2-Dichloroethene (to	tal) NR				- 3.0	-	3.31		2
Methyl-t-Butyl Ether	NR		-				1.2 J		2
1,1-Dichloroethane		- 1	2.3				2.4 J		0
Vinyl Acetate	NR				< 5.0				2
Chloroprene	NR				< 5.0				2
cis-1,2-Dichloroethene			3.0				3.1 J		0
2-Butanone	< 2.0				< 5.0				0
Proionitrile	NR	-			< 20		4		2
Methacrylonitrile	NR			-	< 5.0	-	-	-	2
TetrahudaoGuna	<1.0	-		-	< 50			_	2
Chloroform	<10				<50				0
1.1.1-Trichloroethane	<1.0				< 5.0				0
Carbon Tetrachloride	< 1.0				< 5.0				0
Isobutyl Alcohol	NR				< 250				2
Benzene			1.3				1.3 J		0
1,2-Dichloroethane	< 1.0				< 5.0				0
Trichloroethene	< 1.0			-	< 5.0				0
1,2-Dichloropropane	< 1.0				< 5,0				0
Methyl Methacrylate	NR				< 5.0			1	4
1 4 Dioroniomediane	< 1.0 ND				< 250				2
Bromodichloromethan	e <10				<50	-	-		0
2-Chloroethyl Vinyl F	ther NR			-	< 5.0	1			2
cis-1,3-Dichloroproper	ic < 1.0				< 5.0	1	-		0
to the state	1						-		
									the second se

		COMPAT	USONOF	OA & CO	NTRACTO	OR RESU	TS	Paue 2 of	2
i in the	D	ROIFCT	SHEPI FY	V'S HILL	ANDEL	SPRING	2000	1 age 1 01	-
-p	P P	ROJECT:	anterte	a and a	E	I SPRINC			
	-	-	-		-				
	1			-			-	_	
OA SAMPLE No.:	G0E12070	03-001		co	NTRACT	ORS SAN	PLE No.	1417777	1 1
OA FIELD ID	SHM-96-	SB-OA	-		CONTRA	CTORSE	IELD ID:	SHM-96	SB
OA ANALYSIS DATE:	5/23/00	-		CONTR	ACTOR'S	ANALYS	S DATE:	15/17/00	1
OA LABORATORY:	QUANTE	RRA	-	CONT	RACTOR	'S LABOR	ATORY:	STL VT	1
TRACTION METHOD	5030B				EXTR	ACTION	IETHOD:	5030B	
ANALYSIS METHOD:	8260B			1	AN	ALYSIS	THOD:	18260B	
and the particular second	1								
Y 1 1	MATERI	AL DESCI	RIPTION:	WATER			1		
		DATE SA	AMPLED:	5/11/00			1	-	
	1		UNITS:	ug/L					1
	1.1		S	1					
	11 - T	1200		1				1	1
Ì	1							1	
	1. Second		RESULTS				RESULTS	1 CC	OMPARISON
PARAMETER	QA LAB		QA LAB	CC	NTRACT	OR CC	NTRACTOR	4	CODE
	LRL				LRL				
	1.1.1.1		100.001						1 1
									(
	1			1					
4-Methyl-2-pentanone	< 2.0				< 5.0			-	0
Toluene	< 1.0				< 5.0				0
trans-1,3-Dichloropropene	< 1.0				< 5.0		1		0
Ethyl Methacrylate	NR		1	11000	< 5.0	-			2
1,1,2-Trichloroethane	< 1.0				< 5.0				0
Tetrachloroethene	< 1.0		10.000 P.	1	< 5.0	10.000			0
2-Hexanone	NR				< 5.0				2
Dibromochloromethane	< 1.0	1			< 5.0				0
1.2-Dibromoethane	< 2.0				< 5.0				0
Chlorobenzene	0		0.36 J		< 5.0				0
1,1,1,2-Tetrachloroethane	< 1.0				< 5.0			1	0
Ethylbenzene	< 1.0				< 5.0			-	0
Xylene (total)	< 1.0	1			< 5.0				0
Styrene	< 1.0				< 5.0			-	0
Bromoform	< 1.0	0	-		< 5.0				0
Isopropylbenzene	NR	1			< 5.0				2
cis-1,4-Dichloro-2-butene	NR	0			< 5.0	-			2
1,1,2,2-Tetrachloroethane	NR				< 5.0				2
1.2.3-Trichloropropane	NR				< 5.0				2
trans-1,4-Dichloro-2-butene	NR				< 5.0	-		1	2
1,3-Dichlorobenzene	NR			1-1-1	< 5.0				2
1,4-Dichlorobenzene	1	6	1.3		1		1.6 J		0
1,2-Dichlorobenzene			0.21 J	1	< 5.0	1			0
1,2-Dibromo-3-Chloropropane	< 2.0				< 5.0				0
1.2,4-Trichlorobenzene	< 1.0		-	1	< 5.0	-			0
Hexachlorobutadiene	< 1.0		1.1	1	< 5.0	1			0
Naphthalene	< 1.0				< 5.0				0
2,2-Dichloropropane	< 1.0		1.1	1	< 5.0				0
1,1-Dichloropropene	< 1.0		1 · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	< 5.0				0
1,3-Dichloropropane	< 1.0		1		< 5.0	1			0
Bromobenzene	NR				< 5.0	1.1.1.1.1		-	2
n-PropyIbenzene	NR				< 5.0	1	1		2
2-Chlorotoluene	NR			11	< 5.0				2
4-Chlorotoluene	NR		1	·	< 5.0			- 1	2
11,3,5-Trimethylbenzene	NR		1		< 5.0				2
tert-Butylbenzene	NR		-		< 5.0		-	- [2
1,2,4-Trimethylbenzene	NR		1	1000	< 5.0			-	2
sec-Butylbenzene	NR				< 5.0			-	2
4-Isopropyltoluene	NR		1		< 5.0				2
n-Butylbenzene	NR			-	< 5.0	-	1		2
1,2,3-Trichlorobenzene	< 1.0				< 5.0	-			0
	1065	04			-	-		0511212	
SURROGATE RECOVERIES	(%)	QA		-	-	-	1	PRIMAR	r
1 Dame 0 - 21 - 22 - 12		101	1		Talua	10 /00 11-	<u> </u>		· · · ·
4-bromofluorobenzene (70-13	()	101			1 oluene-o	10 (08-110	44 (72 (41)	90	
Taulana 48 (20, 120)					Ream-D	orocinane	0+(72-141)	80	
10ulciic-d8 (70-130)	-	102			Bromotiu	oroocnzen	e (12-122)		ii
- F	-				1,2-Dichi	oroocitzen	(109-124)	80	
			OPT - DO	CNIDIN	COD PET	TOCOL	MEATTY	-	
and the second sec	1	1	SEE APP	ENDIX A	FURKEY	TUCOM	MENTS	. in case	-

1 1 1		COMPARI	SON OF Q	A & CON	TRACTO	R RESU	LTS	4	
		PROJECT:	SHEPLEY	S HILL I	ANDFIL	L, SPRI	NG 2000		
1			1						
		~	1		1	1			
					in the second		1	4	
QA SAMPLE No.:	G0E120203	-001		CC	ONTRAC	TORS S.	AMPLE No .:	417777	
QA FIELD ID:	SHM-96-51	SHM-96-5B-QA			CONTR	ACTOR	SHM-96-5B		
QA ANALYSIS DATE:	5-(14+15)-(5-(14+15)-00			ACTOR'S	ANAL	:6/9/00		
QA LABORATORY:	QUANTER	QUANTERRA		CONT	TRACTO	R'S LAB	ORATORY:	STL	1
EXTRACTION METHOD:	3010A		0		EXTR	ACTION	METHOD:	3010A	
ANALYSIS METHOD:	6010B,Hg-	7470A			A	ALYSI	S METHOD:	6010, Hg	-7470
		1					1		
				1					
	MATI	RIAL DESC	RIPTION:	WATER			1	3	
		DATE S	AMPLED:	5/11/00			1	1	
		1	UNITS:	ug/L					
		-	1	1		1		1111	1.00
						1	1		
	C221 1503		RESULTS				RESULTS	CC	MPARISON
PARAMETER	QA LAB		QA LAB	CO	NTRACT	FOR (CONTRACTOR	1.1	CODE
	LRL				LRL				
		1	1.00						
Aluminum	NR	-		1			73.3		2
Antimony	< 10				< 4.6	-	1-2-2-		0
Arsenic			4800				5110		0
Barium			65	1.000	1		67.5 B		0
Beryllium	< 5.0						3.2 B		0
Cadmium	< 5.0				< 0.30	-			0
Calciuum	NR						115000		2
Chromium			1.1 B			-	4.0 B		4
Colbolt			19 B			-	23.3 B		0
Copper	< 25		and the				12.8 B		0
Iron			44300		1	-	45000	1	0
Lead	< 5.0	-				-	2.7 B		0
Manganese		10.00	10800	-			11200		0
Mercury	< 0.20	(5-19-00)	1.5		< 0.10	(5-16-0	0)		0
Molybdenum			4.1 B			-	NK		2
Nickel			20 B	-		-	17.5 B		0
Potassium	NR					-	12300		2
Selenium	< 5.0				< 4.0	-	740		0
Suver	< 5.0	-			-	-	0.4 B	-	2
Thainum	< 10	-				-	21.2		3
Vanadium	< 50		0.0.0		-		7.0 B		2
Zinc			8.2 B			-	3.0 B		3
		-	OFF ADD	TNIDING 4	COD WES	TOCO	MACHTE	-	
		-	NR-NOT	DEDOD	D CK KE	1000	WINEN 15		-
		-	De Catin	KEPOKII	bet is less	then the	DI		
		1	B= Estimated result that is less than the RL.						

.
		COMPARISON OF O	A & CON	TRACTOR R	ESULTS	tained and the second		-
	1 1	PROJECT: SHEPLE	Y'S HILLI	ANDFILL	SPRING 2000			-
		TROPOCT. OTHER DE	I					-
	an den de					the second		
And 1 (1997)					1			-
OA SAMPLE No	G0E12020	3-001	CC	NTRACTO	RS SAMPLE No	417777		
OA FIELD ID:	SHM-96-5	B-OA		CONTRAC	TORS FIELD ID:	SHM-9	6-5B	
OA ANALYSIS DATE:	5/12/00		CONTR	ACTOR'S AT	NALYSIS DATE:	5/19/00		-
OA LABORATORY:	OUANTER	RRA	CONT	RACTOR'S	LABORATORY:	STL. V	r	-
EXTRACTION METHOD:	NA			EXTRAC	TION METHOD:	NA		-
ANALYSIS METHOD:	19012A		1	ANAL	YSIS METHOD:	9010		
1					1			-
								-
1 1	MATER	IAL DESCRIPTION:	WATER					-
		DATE SAMPLED	5/11/00				1	-
		UNITS	ug/I.				1	-
		0	-0				-	-
						1	1	-
	1						1	-
		RESULTS			RESULTS		OMPARISO	N
PARAMETER	OA LAB	OA LAB	CO	NTRACTOR	CONTRACT	OR	CODE	
	LRL	Q.1.0.1.0		L.R.L.		1	10002	-
							1	-
								-
							1	-
Cyanide (CN)	< 10.0			< 10.0		3	0	
								-
						-	1	-
						1		_
								-
							-	-
							1	-
						1		-
							1	-
							1	
								_
								-
							-	-
						8		
						- Free -		-
						1		_
	1					9	1	-
								-
e 1						1		-
		SEE APP	ENDIX A	FOR KEY TO	COMMENTS		1	-
			DEDODT					_

							1
		OMPARISON OF C	A & CON	TRACTOR	RESULTS		
	rent rent rent rent rent rent rent rent	ROJECTISHEPLE	Y'S HILL I	ANDRILL	SPRING 2000		1
- frances - same					1 1		· · · · · · · · · · · · · · · · · · ·
	-						
OA SAMPLE No 1	C0E120203	1.001	C	NTRACT	OPS SAMPLE No	417777	
OA FIFLD ID	SHM-96-5F	2.00.0A		CONTRA	CTORS FIFI D ID	SHM-96-	CD .
OA ANALYSIS DATE:	5/12/00	100-21	CONTR	ACTOR'S	ANALYSIS DATE:	NR	10
OA LABORATORY:	IOUANTER	RA	CONT	TRACTOR'	SLABORATORY:	STL. VT	
XTRACTION METHOD:	NA			EXTRA	CTION METHOD:	NA	1
ANALYSIS METHOD:	300.0			ANA	LYSIS METHOD:	300.0	1
	19-19-1						
	1			-			
	MATERIA	AL DESCRIPTION:	WATER				
		DATE SAMPLED:	5/11/00				
		UNITS:	mg/L				
		RESULTS			RESULTS	CC	MPARISON
PARAMETER	QA LAB	QA LAB	CO	NTRACTO	R CONTRACTOR		CODE
	LRL			LRL			
			1				
Chloride, CL		48.7 Q			53.5		0
Nitrate, as N		0.076		< 0.2			0
Othophosphate, as P	< 0.20	- 10		< 0.2			0
Sulfate, SO4		3.8			5.2		0
	_						
				-			
	-						
						_	
		SEE APPI	NDIX A F	OR KEY T	O COMMENTS	_	
		NR=NOT	REPORTE	D			
		O=Elevate	d reporting	limit due te	o high analyte level.		

÷

The second se		1		P 1		4	1
				F I			1
	a - 10	COMPARISON O	FQA & CON	TRACTOR R	RESULTS	1	
1		PROJECT: SHEP	LEY'S HILL	LANDFILL, S	SPRING 2000		1
							1
i i				1	i, ž		
	i						1
QA SAMPLE No.:	G0E12020	3-001	C	ONTRACTOR	RS SAMPLE No.:	417777	
QA FIELD ID:	SHM-96-5	B-QA		CONTRAC	TORS FIELD ID:	SHM-96-5B	
QA ANALYSIS DATE:	5/18/00		CONTR	RACTOR'S AN	NALYSIS DATE:	NR	
QA LABORATORY:	QUANTER	RRA	CON	TRACTOR'S	LABORATORY:	STL, VT	
EXTRACTION METHOD:	NA			EXTRAC	TION METHOD:	NA	1
ANALYSIS METHOD:	:410.4-COE			ANAL	YSIS METHOD:	410.1-COD	1
						1	
				1			
	MATER	IAL DESCRIPTION	DN: WATER		1		-
		DATE SAMPLI	ED: 5/11/00		1 1		
		UNI	TS: mg/L		1		
	1						
					1	1	
		RESU	LTS	-	RESULTS	COMPARIS	SON
PARAMETER	QA LAB	QA L.	AB CO	ONTRACTOR	CONTRACTOR	CODE	
	! LRL			LRL			-
	1						
	1			-			
emical Oxygen Demand (COD)		28.0	0	1	18	0	-
						1	-
	1	-					-
	1						-
							-
			5				
	1					1	-
	1						-
	1						_
	1						-
	-		-				-
	4					-	
		SEE A	PPENDIX A	FOR KEY TO	COMMENTS		
		NR=N	OT REPORT	ED			
							t

and the first statement	1		1		COMPA	RISON OF	QA & CO	NTRACT	OR RES	ULTS	-		
				1	ROJECT	SHEPLE	Y'S HILL I	ANDFIL	L, SPRIN	IG 2000		en haaitee	
			1		1					1			
	1		·					1.00					1
				and the second second	1	1			1.1	1. 1			
	QA SAM	PLE No .:	1	G0E1202	03-001		CC	ONTRAC	TORS SA	MPLE No .:	4177	77	
	QA F	TELD ID:	1	SHM-96-	5B-QA		10.00	CONTR	ACTORS	FIELD ID:	SHM	1-96-5B	
QA	ANALYS	IS DATE:		5/17/00			CONTR	ACTOR'S	ANALY	SIS DATE:	NR		
(QA LABOR	ATORY:		ICLS LAB	S		CON	FRACTOR	R'S LABO	ORATORY:	STL.	VT	
EXTR	ACTION M	IETHOD:	1	NA				EXTR	ACTION	METHOD:	NA		
AN	ALYSIS M	IETHOD:	1	405.1				AN	ALYSIS	METHOD:	405.	1	
			() ()	1							1		141.
											1		
	-			MATERI	AL DESC	RIPTION:	WATER						
					DATE S.	AMPLED:	5/11/00						
			·			UNITS:	mg/L						
						1							
		1					1.1.1			1			-
_								-					
	DIDIN			-		RESULTS				RESULTS		COMPARI	SON
-	PARAME	TER		QA LAB		QA LAB	CO	NTRACT	OR C	ONTRACTO	OR	CODE	
				LRL				LRL				_	-
_				1									-
				-									-
Andres		1/6	D \	110				(20	-			0	
ologica	1 Oxygen D	emand (5	Day)	< 1.0				< 2.0				0	-
				-					-	-			-
-						-							-
_			1	1									-
						-							-
				-					-				-
-		_											-
					1								-
				1				1200					-
			1					11000					
-									-				
1					1							-	
				-									
	1				1.0			1					
					N			1000.11					
					1.0							1	
					1.1.1.1.1								
				1									
									1			1	
						SEE APPE	ENDIX A H	OR KEY	TO COM	IMENTS			
	1	1		1		NR=NOT	REPORTE	D		1			1

				-		1				+10-	
			COMPADI	CONOFO	1 8 CON	TRACTO	DECU	TO	· •	11116-	
	· ······		PROJECT	SON OF Q	A & CON	INACIO	CRESU	10 2000			
		·	PROJECT	SHEPLE	SHILL	LANDFIL	L, SPRII	0 2000		L	-
	· · · · · · · · · · · · · · · · · · ·	4		-		-		*			-
						-					
OASAN	PIENO -	IC0E12020	3-001	-	C	ONTRACT	INRS SI	MPLE No 1	1417777	1	
OAF		SHM-96-5	B.OA	-		CONTR	ACTOR	S FIFL D ID	SHM-06	SR	
OA ANALYS	IS DATE:	5/17/00	o Qu	-	CONTR	ACTORS	ANAL	SIS DATE:	INR		
OALABOR	ATORY	OUANTE	RRA		CON	TRACTOR	SIAR	ORATORY	STI VT	1	-
EXTRACTION	AETHOD:	NA			0011	EXTR	ACTION	METHOD:	INA	1	76
ANALYSIS N	IETHOD:	310.1		1		AN	ALYSIS	METHOD:	310.1		1
1				1 3							-
				-			-			1	
	1	MATER	IAL DESC	RIPTION	WATER			1 1			
1	1	1 1	DATES	AMPLED:	5/11/00		-	1			
				UNITS:	mg/L						
	-										
4								1			
1	1			RESULTS		1000	1	RESULTS	CC	MPARISC	N
PARAME	TER	QA LAB		QA LAB	CC	NTRACT	OR C	CONTRACTOR		CODE	
i i		LRL				LRL					
							-				
i i	1					1					
1											
Total Alk	alinity as CaCO3			395			1	316		0	
							1				
			_	1						-	
		1		1			1				
				1				1			-
		-									
		-									_
		1	_								
			_	-				1			-
1		1		1							
42		-		-				1			
		-		1			-				
1		1	-								
				-							
		-									
		1								-	
		-									
1						-					1
1				SEE APPE	ENDIX A	FOR KEY	TO CO	MMENTS			
				NR=NOT	REPORT	ED		T		111	

	1						
					- and a -		
	100	MPARISON OF C	A & CON	TRACTOR R	ESUI TS	er an character allows	
	PR	OIECT SHEPLE	V'S HILL I	ANDEILLS	PRING 2000		
		COLCT. SHELLE	I STILL L	CARDITICE, S	111110 2000		
				-		(*)+)	
			-				
		001					
QA SAMPLE No .:	G0E120203-	001	CC	INTRACTOR	S SAMPLE No .:	417777	
; QA FIELD ID:	SHM-96-5B-	QA		CONTRACT	ORS FIELD ID:	.SHM-96-	5B
QA ANALYSIS DATE:	15/23/00		CONTR	ACTOR'S AN	ALYSIS DATE:	NR	
QA LABORATORY:	QUANTERR	A	CONT	FRACTOR'S I	LABORATORY:	STL, VT	
EXTRACTION METHOD:	NA	1923 No. 199		EXTRACT	TION METHOD:	NA	
ANALYSIS METHOD:	130.2			ANAL	YSIS METHOD:	130.2	
						1	
						1	
1 1	MATERIA	L DESCRIPTION:	WATER				
	II	DATE SAMPLED:	5/11/00				
		UNITS:	mg/L				
1 1					-		
		DECINTO			DECINTO		MPADICON
DADAMETED	OATAD	CALAD	00	NTDACTOR	CONTRACTO		MPARISON
PARAMETER	QALAB	QALAB	1	IDI	CONTRACTO	JK	CODE
	LKL			LRL			
						1	
					-		
Total Hardness as CaCO3		346			330		0
					1.1		
			-				
_							
			1.00				
		SEE APPE	NDIX A F	OR KEY TO	COMMENTS		
		NR=NOT	REPORTE	D			

	L		e	0			_			t	-
		-			1001000		TOD DEGUL	TO		1	-
			-i.	COMPAR	ISON OF C	A & CONTRAC	CTOR RESUL	IS			
				PROJECT	SHEPLE	r'S HILL LAND	FILL, SPRINC	1 2000		1	
										+	
i		the form	1,				1			-	
	OASAN	IDI E No il	100512020	13 001	-	CONTRA	CTOPSSAM	DIENa	:017777		
	QA SAN		CUM OG	DOM		CONTRA	TPACTOPS F	IELD ID	SHM 06	50	
04	ANALVS	IS DATE	5/16/00	DD-QA		CONTRACTO	DIS ANAL VSI	C DATE-	NIP	-70	
C	ALABOR	ATORY	OUANTE	RRA	1	CONTRACT	COR'S LABOR	ATORY	STL VT		
EXTRA	ACTION N	IETHOD!	NA	iuui		EX	TRACTION	ETHOD	NA NA	<u>k</u>	
AN	ALYSIS N	(ETHOD:	160 L and	160.2		Lat	ANALYSIS M	ETHOD:	160.1 an	d 160.2	
		Binob.	TOO.T und	100.2			THILL TORG IN	Emos.	1100.1 41	1.00.0	
-			1				1			-	
			MATER	IAL DESC	RIPTION:	WATER					
				DATE S	AMPLED:	5/11/00 1					
			1		UNITS:	mg/L					
1	1.1										
1000		De 19 (0							1 1		
	1.			I	1			1. A.	3		
					RESULTS			RESULTS	CI	OMPARISO	N
	PARAME	TER	QA LAB		QA LAB	CONTRA	CTOR CO	NTRACTOF	ર	CODE	
			LRL			LRI	L				
1								1	1	1	
					-				Ť	1	
						Ţ.					
Total Dis:	solved Soli	ids (TDS by 160.1)		-	486		-	474		0	
Total Sus	pended So	lids (TSS by 160.2)			56.0		1	52.7		0	
	1					E.					
					1		-			-	
	1.0			-					0		1
			-		-		-			-	
			1					-		-	1000
			1			*	-		1	1	-
			1				-		1	1	
1	1		1						-	-	
					1				1 T	-	
							-				
	1				1						
		and the second	1								
				P					et.	1	
		1				1					
		1	1							1	1.8
					(1				8		
			1		SEE APP	ENDIX A FOR K	CEY TO COM	MENTS		1	
			1		NR=NOT	REPORTED		1			

shl(spring00)inorganics.xls

APPENDIX C

SAMPLE RECEIPT & CUSTODY DOCUMENTATION

	Report to) '	Invoid	e to				40.0				1	1	1	7	1	1	1	1	1 1	Lab use only
CompanyII	5. Aca	Current Barra	Company					ANA		IS	n /		1	160		/	1	/	/ /		Due Date:
Address (29)	S Virai	nic Ruco	Addrass:	- 11-				TIE	JUEC	DIE	1	N	1	50		1	1	/	/ /		
Address.	0	54710 MI	Audress.								19	2/	1	7	1	/	/	/	/		Temp of coolers
Contract	anie Li	1207 101	Castad				-				1'	/	0	7	/	1	/	1	1	/	when received (C
Contact. 1-1	SIF -	8175	Dhassi				-			1	5	1	e.	/	/	/	/	/			Custody Seal
Phone: <u>1.10</u>	Faic	\$663	Phone:				-			1.	9/	3	X	8/	1	1	1	/			Intact
Contract/	(1)		PO/SO #:				-			1=	3	5/-	10	5	1	1	1	/	1		Screened
Quote #: Sampler's Name		N. K	Sampler's Signature				-		23	~	10	414		1	10	V/	/	/	1	1	For Radioactivity
Steve Sm	mit	John dun							200	10	1	it	Ac	So	0	1			/		
Proj No	Project Na	me		No./Ty	/pe ol (Contair	ers?		1.	00	1	30	A	1	Y	1		1			
EØ 776	Shep	1e7's [4:1]	LINEM						1 3	1:	D	7	1		1/	/	1	1			
Malrix' Date Time	C G r m a b	Identilying Marks o	f Sample(s)	VOA	A/G 1 L1.	250 ml	P/O	Voc	Mek	J	Anie	100	No	14	3/				Lat	o Sam	ple ID (Lab Use C
W 5/11/10 1235	X	SHM-96-5	BQ A	3		1	5	3	1	1	(1	L	1							
W s/11/00 -	X	TRIP BLANK		2	100	-	-	2	-	-	-	-	-	-			-		-		
											_	_				_					
A	nl			-		-		-	-	_	-	_	F	RE	FIVE	IT IK	Cor	0.00	WOITE	ON	7
X	- In-	.1			-			_		_		_		-		UN	ER	OC	NUTT		
	you	ny																		1	
	Y	g								_		_			M.	AY	12	200	00		
				-	-			_	_	-		_		L	_	-	10	A			
	X				-						1			11	II:		U	0			

Chain of Custody Record

P. Sequoia



Client STL- SAC		Project Mai	nager			4	7	SVE	הכ	K	5				Da	5-1	2-00		Chain of Cus	lody Number	2698
880 Riverside (rKul	Telephone	Numb	er (A	Area C	Code	/Fax	Numb	ber	1-					La	Numbe	nr -		Page	of	
City Sale Zip Co	de /	Sile Contac	cl.				Lab C	onlac	:l			L		A	nalysis ore spi	Attac	h list if eeded)				
Project Name USALDE		Carrier/Wa	ybill Ni	umb	er														So	cial Instru	uctions/
Contract/Purchase Order/Quole No.				Ма	Irix		IÇ.	Co Pre	ntain eserv	ers alive	& es	C.							Con	dilions of	Receipt
Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Aqueous	Sed.	Soil		Unpres	HNOS	HCI	NaOH	Znac	a	11								
60 E120203-1	5-11-00	1235	4				X	-				X							So	0519	3.01
		-				-	-	+	-	-	+		$\left \right $	-	+	-		+		_	
	1						-		T												
			$\left \right $			-		+		+	+	-			+			-			
a <u>a 12 a</u> na a								T	1	1									1		
				X																	
			$\left \right $	-		-	+	+	+	-	14	+			+	-					
······							-	+	-	1		-		-	H	-			-		
Possible Hazard Identification	Polson B	Unknown	Sampl	le Di	isposa n To C	al Client		Dis	posa	Byl	ab [Arc	hive F	for		donihs	(A lee maj longer tha	y be asse n 3 monti	ssed il samp	les are relair	ned
Turn Around Time Required	s 21 Days	Olher_					ľ	OC R	equin	mer	nts (Spe	city)		1							
1 Relinquished By		Date 5-124	20	1	13	50		I. Rey	Deive	R	est	\$	1	HAN AND	X				Date		BI
2 Relinquished by 2		Dalo		Ti	ime	*		2. Red	céiva	TBY	for for		-						Date	Tim	ie
3 Relinquished lig		Date		Ti	іте		3	3. Rec	ceive	d By	1						-		Date	Tim	18

DISTRIBUTION: WHITE Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

	10.4				
CLIENT US	AMy Cor	ρ	PM_ <u>DB</u> LOG	0# 216	7
LOT# (QUANTIMS I	0) _ OOE 120	203 QUOTE#_	30186		JILOA V
				Initials	Date
					butt
DATE RECEIVED	5-12-60 TI	ME RECEIVED	6	as	5-12-0
DELIVERED BY			CLIENT	1	
Ĺ.		GOLDENSTATE	DHL		
C] UPS 🗌	BAX GLOBAL	GO-GETTERS		
0		OTHER			
and the second second	1				
CUSTODY SEAL STA			N/A		
CUSTODY SEAL #(S)					
SHIPPPING CONTAI	NER(S)		N/A		
		2 2 17			
	ord (IN °C) IR 1万	2 🗆		_	
TEMPERTURE RECO	0RD (IN °C) IR 1, 	2 🗆		-	+
TEMPERTURE RECC COC #(S) TEMPERATURE BLA		2 🗆		-	-
TEMPERTURE RECC COC #(S) TEMPERATURE BLA AMBIENT TEMPERA		2 🗆			
TEMPERTURE RECO COC #(S) TEMPERATURE BLA AMBIENT TEMPERA DH MEASURED		2 [] 			
TEMPERTURE RECO COC #(S) TEMPERATURE BLA AMBIENT TEMPERA DH MEASURED ABELED BY		2 []			
TEMPERTURE RECO COC #(S) TEMPERATURE BLA AMBIENT TEMPERA OH MEASURED ABELED BY		2 [] 			
TEMPERTURE RECO COC #(S) TEMPERATURE BLA AMBIENT TEMPERA OH MEASURED ABELED BY ABELED BY		2 ANOMALY			
EMPERTURE RECO COC #(S) EMPERATURE BLA AMBIENT TEMPERA OH MEASURED ABELED BY ABELED BY ABELS CHECKED B CHORT HOLD TEST		2 ANOMALY SAMPLE RECEI WETCHEM		du)	
TEMPERTURE RECC COC #(S) TEMPERATURE BLA AMBIENT TEMPERA OH MEASURED .ABELED BY ABELS CHECKED B SHORT HOLD TEST		2 ANOMALY SAMPLE RECEI WETCHEM		- AW	
TEMPERTURE RECC COC #(S) TEMPERATURE BLA AMBIENT TEMPERA PH MEASURED LABELED BY LABELED BY LABELS CHECKED B SHORT HOLD TEST		2 ANOMALY ANOMALY SAMPLE RECEI WETCHEM		dw ap	
TEMPERTURE RECO COC #(S) TEMPERATURE BLA AMBIENT TEMPERA OH MEASURED ABELED BY ABELS CHECKED B SHORT HOLD TEST	ORD (IN °C) IR 1 NK TURE YES Y NOTIFICATION ED OF FILTER/PRESERV MENT RECEIVED IN GO EMPERATURES, CONT.	2 2 ANOMALY ANOMALY SAMPLE RECEI WETCHEM VE VIA VERBAL & EMAIL OOD CONDITION WITH AINERS, PRESERVATIVES		du ap	
TEMPERTURE RECO COC #(S) TEMPERATURE BLA AMBIENT TEMPERA OH MEASURED ABELED BY ABELS CHECKED B CHORT HOLD TEST	ORD (IN °C) IR 1	2 ANOMALY ANOMALY SAMPLE RECEI WETCHEM VE VIA VERBAL & EMAIL OOD CONDITION WITH AINERS, PRESERVATIVES EXCEEDED (2 °-6 °C)		de la contra de la	
TEMPERTURE RECO COC #(S) TEMPERATURE BLA AMBIENT TEMPERA OH MEASURED ABELED BY ABELS CHECKED B SHORT HOLD TEST METALS NOTIFIE COMPLETE SHIP APPROPRIATE T Clouseau WET ICE	ORD (IN °C) IR 1 NK TURE YES Y NOTIFICATION ED OF FILTER/PRESERV MENT RECEIVED IN GO EMPERATURES, CONT. TEMPERATURE BLUE ICE	2 ANOMALY ANOMALY SAMPLE RECEI WETCHEM /E VIA VERBAL & EMAIL OOD CONDITION WITH AINERS, PRESERVATIVES EXCEEDED (2 °-6 °C) GEL PACK		du ap	
TEMPERTURE RECC COC #(S) TEMPERATURE BLA AMBIENT TEMPERA OH MEASURED ABELED BY ABELS CHECKED B SHORT HOLD TEST METALS NOTIFIE COMPLETE SHIP APPROPRIATE T Clouseau WET ICE PM NOTIFIED	ORD (IN °C) IR 1 NK ATURE YES Y NOTIFICATION ED OF FILTER/PRESERV MENT RECEIVED IN GO EMPERATURES, CONT. TEMPERATURE BLUE ICE NO COOLING AN	2 ANOMALY ANOMALY SAMPLE RECEI WETCHEM VE VIA VERBAL & EMAIL DOD CONDITION WITH AINERS, PRESERVATIVES EXCEEDED (2 °-6 °C) GEL PACK GENTS USED		du ap	

LEAVE NO SPACES BLANK. USE "N/A" IF NOT APPLICABLE. INITIAL AND DATE ALL "N/A" ENTRIES.

QA185 3/00 PAS

Chemical Quality Assurance Report Fall 2000

•

.

SHEPLEY'S HILL LANDFILL LONG TERM MONITORING DEVENS, MASSACHUSETTS

CHEMICAL QUALITY ASSURANCE REPORT No. E0776-041301

NOVEMBER 2, 2000 SAMPLING EVENT

PREPARED BY THE GEOLOGY AND CHEMISTRY SECTION ENGINEERING/PLANNING DIVISION

DEPARTMENT OF THE ARMY NEW ENGLAND DISTRICT, CORPS OF ENGINEERS CONCORD, MASSACHUSETTS

APRIL 13, 2001

SHEPLEY'S HILL LANDFILL LONG TERM MONITORING DEVENS, MASSACHUSETTS NOVEMBER 2, 2000 SAMPLING EVENT

CHEMICAL QUALITY ASSURANCE REPORT No. E0776-041301

TABLE OF CONTENTS

Paragraph	Title	Page
	Executive Summary	1-2
	Table 1- Data Comparison Summary	3
	Table 2 - Analyses Performed by QA Laboratory	4
1.	QA sample shipping and chain-of-custody deficiencies	5
2.	Data comparison for volatiles by Method 8260	5-6
3.	Data comparison for metals by Method 6010 and 7470	6
4.	Data comparison for cyanide by Method 9010B	7
5.	Data comparison for anions by Method 300.0	7
6.	Data comparison for COD and BOD by Method 410.4 and 405.1	7-8
7.	Data comparison for alkalinity by Method 310.1	8
8.	Data comparison for hardness by Method 130.2	8-9
9.	Data comparison for TDS and TSS by Methods 160.1 and 160.2	. 9
10.	References	9
	Appendix A - Key to comments on Data Comparison Code	÷
	Appendix B - Data Comparison Tables	
	Appendix C - Custody Documentation	

SHEPLEY'S HILL LANDFILL LONG TERM MONITORING DEVENS, MASSACHUSETTS NOVEMBER 2, 2000 SAMPLING EVENT

CHEMICAL QUALITY ASSURANCE REPORT No. E0776-041301

Executive Summary

QA samples from one shipment for Shepley's Hill Landfill Long Term Monitoring, Devens, Massachusetts were analyzed by the QA laboratory, resulting in a total of 76 target analyte determinations. The shipment contained one QA water sample and one trip blank sample and was received in good condition. The data report from the QA laboratory, STL-West Sacramento (Severn Trent Laboratories), dated 12 December 2000 was used in the comparison. In 26 of these determinations analytes were detected by one or both laboratories. Results from the analysis of QA samples were compared with results from analysis of the corresponding primary samples (Reference 10a). The primary and QA samples agreed overall in 74 out of 76 (97.4%) of the comparisons. Primary and QA samples agreed quantitatively in 24 out of 26 (92.3%) of the comparisons. Quantitative agreement represents only these determinations where an analyte was detected by at least one laboratory. No major and two minor discrepancies between results from the primary and QA samples were noted. Refer to Table 1 for a QA split sample data comparison summary.

The QA laboratory's data report was evaluated based on the information that was provided. All of the data comparisons for Methods VOA's-8260, TAL Metals-6010, CN, Anions, COD, BOD, Alkalinity, Hardness, TSS and TDS were in good overall and quantitative agreement. There were only two minor data discrepancies noted for the metals analysis of thallium and selenium. The QA laboratory did not perform all of the TAL metals as requested on the chain-of-custody and no comparison could be made on aluminum, calcium, magnesium, potassium and sodium. The QA laboratory was requested to provide this additional data that should be available from their simultaneous trace-ICAP instrument data files. If these results are obtained, they will be added to this report at a later date. All the other quantitative results for all analyses compared closely. There was very little bias to any of the sample results and the data appears to be complete and useable.

The primary laboratory's data report was evaluated based on the information that was provided. As stated above, all of the data comparisons for the majority of the analyses were in good overall and quantitative agreement. The sample results for all of the analyses were supported by the QC data and appear to be reasonably complete and useable. The QA laboratory's reporting limits for volatiles was approximately five times lower than the primary laboratory's volatile reporting limits. The primary laboratory did not report the samples in which tentatively identified compounds (TIC's) were detected. Historically, the primary laboratory has been requested to provided the number of TIC's detected in each sample. This CQAR is based on the laboratory reporting limits because the detection limits were not always provided or well defined.

QA analyses were performed by Severn Trent Laboratories, 208 South Park Drive, Suite 1, Colchester, VT, 05446. The primary laboratories were Severn Trent Services, 880 Riverside Parkway, West Sacramento, CA, 95605-1500 and Sequoia Analytical, 819 Striker Avenue, Suite 8, Sacramento, CA 95834.

<u>Table 1</u> <u>Quality Assurance Split Sample</u> Data Comparison Summary

	Overall Agreemen	t (1)	Quantitati Agreemer	ive nt (2)
Test Parameter	Number	Percent	Number	Percent
VOC	47/47	100	9/9	100
METALS	16/18	88.9	7/9	77.8
CYANIDE	1/1	100	NA	NA
ANIONS	4/4	100	2/2	100
COD	1/1	100	1/1	100
BOD	1/1	100	1/1	100
ALKALINITY	1/1	100	1/1	100
HARDNESS	1/1	100	1/1	100
TDS	1/1	100	1/1	100
TSS	1/1	100	1/1	100
Total	74/76	97.4	24/26	92.3

Project: Shepley's Hill Landfill Long Term Monitoring, Devens, Massachusetts, November 2, 2000 Sampling Event

NOTES:

(1) Represents the number and percentage agreement of all determinations including analytes not detected by either laboratory.

(2) Represents the number and percentage agreement of only those determinations where an analyte was detected by at least one laboratory.

TABLE 2

QA ANALYSES PERFORMED

SAMPLE ID	MATRIX	SAMPLE DATE	ANALYSIS
SHM-96-5B-QA	WATER	11-2-00	VOC,METALS,CN, ANIONS,COD,BOD,ALK, HARDNESS,TDS,TSS
TRIP BLANK	WATER	11-2-00	VOC

÷ .

.

•

÷

SHEPLEY'S HILL LANDFILL LONG TERM MONITORING DEVENS, MASSACHUSETTS NOVEMBER 2, 2000 SAMPLING EVENT

CHEMICAL QUALITY ASSURANCE REPORT No. E0776-041301

QA Findings

1. QA sample shipping and chain-of-custody deficiencies.

One shipment containing one QA water sample and one trip blank sample was received by Severn Trent Services, West Sacramento, CA, on 3 November 2000. Proper sample handling protocols were followed for this shipment.

A copy of the chain-of-custody form document and cooler receipt form is appended to this report for reference.

2. Data comparison for volatiles (VOC) by Method 8260.

There were 47 volatile determinations. In nine of these determinations, target analytes were detected by one or both laboratories. There was overall agreement in 47 (100%) of the cases and quantitative agreement in nine out of nine (100%) of the cases. No major or minor data discrepancy was noted.

The QA laboratory's QC and samples were evaluated based on the information that was provided. The method blank and the trip blank were free of contamination above the laboratory's reporting limit for all of the target analytes, except for trichlorofluoromethane at 1.9 ug/L in the trip blank. All of the samples, LCS/LCSD's, method blank, and trip blank surrogates recoveries were within the laboratory's acceptance limits. All of the LCS/LCSD's target analytes were also within the acceptance limits for accuracy and precision. The QA laboratory only spiked five of the target analytes into the LCS/LCSD. The QA laboratory was not requested to perform MS/MSD's and no evaluation of accuracy and precision due to matrix effects could be made. All of the samples were analyzed within the required holding times. The QA laboratory's reporting limits were approximately five times lower than the primary laboratory.

The primary laboratory's QC samples contained all the necessary information and a complete evaluation was performed. The trip blanks were free of contamination above the laboratory reporting limit for all of the target analytes, except for estimated levels of hexachorobutadiene, naphthalane and 1,2,3-trichlorobenzene which were also detected in the method blanks. Trip blank 2 was free of contamination above the laboratory's reporting limit for all of the target analytes, except for trichlorofluoromethane at 1.4 J ug/L which was also reported in the QA laboratory's trip blank at 1.9 ug/L. The surrogates for the samples and the laboratory's

QC samples were all within the acceptance limits. The primary laboratory reported that the MS/MSD's performed on sample MW-SHL-19-00 were outside the acceptance limits for precision in one out of 84 of the cases and seven out of 168 target analytes recoveries were outside the acceptance limits for accuracy. All of the target analytes in the LCS's were recovered within the acceptance limits, except in two out of 84 of the cases, two out of the 84 cases and two out of the 84 of the cases, for the three respective LCS's analyzed. All of the samples were analyzed within the required holding times.

The primary laboratory has historically been requested by the USACE project chemist, Marie Wojtas, to report the number of tentatively identified compounds (TIC's) found in each sample and report the findings in the case narrative. The primary laboratory did not supply any information regarding TIC's in their case narrative.

3. Data comparison for TAL metals by Method 6010 and mercury by Method 7470.

There were 18 metals determinations. In nine of these determinations, target analytes were detected by one or both laboratories. There was overall agreement in 16 (88.9%) of the cases and quantitative agreement in seven out of nine (77.8%) of the cases. No major and two minor data discrepancies were noted.

The first minor data discrepancy occurred in sample SHM-96-5BQA in which the QA laboratory reported selenium at 14 ug/L and the primary laboratory reported 6.6 ug/L. The second minor discrepancy occurred in sample SHM-96-5BQA in which the QA laboratory reported thallium at 7.3 B ug/L and the primary laboratory reported 19.4 ug/L.

The primary laboratory's QC and sample results were evaluated based on the information that was provided. The method blanks were free of contamination above the reporting limit for all of the target analytes. The primary laboratory reported that the LCS recoveries were within the acceptance limits for all of the target analytes. The primary laboratory performed a matrix spike and a matrix duplicate on sample SHL-19-00. The matrix spike recoveries were all within the acceptance limits of 75-125%, except for arsenic and selenium. The post digestion spike performed on this sample was marginally above the control limits for copper. All of the spike levels, percent recoveries and QC limits were appropriately indicated in the QC report. All of the samples were analyzed within the required holding times.

The QA laboratory's QC data was within the acceptance limits for all the target analytes, except only 18 of the 23 TAL metals were analyzed. The method blanks were free of contamination above the reporting limits. The QA laboratory reported that the LCS and the MS/MSD's were within the acceptance limits for both accuracy and precision. All of the spike levels, percent recoveries and QC limits were appropriately indicated on all of the QC reports. The QA laboratory reported all of the metals were analyzed by Method 6010B Trace-ICP, except for mercury, which was analyzed for by Method 7470-Mercury Cold Vapor. All of the samples were analyzed within the required holding times.

4. Data comparison for total cyanide by Method 9010B.

There was one cyanide determination. There was 100% overall agreement in that cyanide was not detected by either laboratory. No major or minor data discrepancies were noted.

The primary laboratory's sample and QC data was evaluated based on the information that was provided. The method blank was free of contamination above the laboratory's reporting limit. The LCS's recovery was not reported. The matrix spike was recovered below the acceptance limits of (75-125%) at 46.3% and indicates a low bias to the sample result. The post digestion spike was recovered at 101.4%. The matrix duplicate and the original sample were reported below the laboratory's reporting limit. The sample was analyzed within the required holding time.

All of the QA laboratory's sample and QC data were within acceptance limits and a complete evaluation was performed. The method blank was free of contamination above the laboratory's reporting limit. The LCS and MS/MSD's were within the acceptance limits for both accuracy and precision. No sample duplicate results were reported for cyanide. The QA laboratory analyzed the sample by modified Method 9012A, instead of Method 9010B as indicated on the chain of custody. The sample was analyzed within the required holding time.

5. The data comparison for anions by Method 300.0.

There were four anion determinations. In two of these determinations, target analytes were detected by one or both laboratories. There was overall agreement in four (100%) of the cases and quantitative agreement in two out of two (100%) of the cases. No major or minor data discrepancies were noted.

The QA laboratory's QC and sample results were evaluated based on the information that was provided. The method blanks were free of contamination above the reporting limit for all of the target analytes. The LCS and MS/MSD's were within the acceptance limits for all of the target analytes for accuracy and precision and the spiking levels were also indicated. All of the samples were analyzed within the required holding times.

The primary laboratory's QC data were evaluated based on the information that was provided. The method blanks were free of contamination above the reporting limit for all of the target analytes. The LCS recoveries appeared to be within reasonable acceptance limits, except for ortho-phosphate which was recovered at 120%, 126%, 139% and 135%. No LCS control limits were provided in the report. The primary laboratory reported that the matrix spike and the matrix duplicate appeared to be within reasonable laboartory's acceptance limits, but no QC limits were provided. All of the samples were analyzed within the required holding times.

6. Data comparison for COD by Method 410.4 and BOD by Method 405.1.

There was one COD and one BOD determination. In both the COD and BOD

7

determinations, there was 100% overall and quantitative agreement. There were no major or minor data discrepancies noted.

The primary laboratory's QC and samples were evaluated on the information that was provided. The method blanks were free of contamination for both the COD and BOD results, above the laboratory's reporting limit. The LCS recoveries for COD and BOD were within reasonable laboratory's acceptance limits, assuming (90-110%) recoveries. The primary laboratory did not report any matrix spike or matrix duplicate results. The samples were analyzed within the required holding times.

The QA laboratory's QC and samples were evaluated on the information that was provided. The method blanks were free of contamination above the reporting limits for COD and BOD. The LCS for COD was within the acceptance limits for accuracy. The LCS for BOD was slightly above the control limits of (85-115%) at 120% and the duplicate result was within the BOD's acceptance limits for precision. The BOD sample was analyzed within the required holding times of 48 hours. The QA laboratory's subcontracted lab (Sequoia Analytical) performed the BOD analysis.

7. The data comparison for alkalinity by Method 310.1.

There was one alkalinity determination. In this determination, there was 100% overall and 100% quantitative agreement. No major or minor discrepancies were noted.

The QA laboratory's QC and samples were evaluated based on the information that was provided. The method blank was free of contamination above the reporting limit. The QA laboratory reported that the LCS/LCSD's were within the acceptance limits for both accuracy and precision. There were no MS/MSD's performed for alkalinity and no evaluation of matrix effects could be made. All of the samples were analyzed within the required holding times.

The primary laboratory's QC and samples were evaluated based on the information that was provided. The method blank was free of contamination above the reporting limit. The primary laboratory reported that the LCS's were within the acceptance limits. The primary laboratory reported that the duplicate and the matrix spike results were within reasonable QC limits, but no control limits were provided. All of the samples were analyzed within the required holding times.

8. Data comparison for total hardness by Method 130.2.

There was one hardness determination. In this determination, there was 100% overall and 100% quantitative agreement. No major or minor discrepancies were noted.

The QA laboratory's QC and samples were evaluated based on the information that was provided. The method blank was free of contamination above the laboratory's reporting limit.

The QA laboratory reported that the LCS/LCSD's were within the laboratory's acceptance limits for both accuracy and precision. There were no MS/MSD's performed for hardness and no evaluation of matrix effects could be made. All of the samples were analyzed within the required holding times.

The primary laboratory's QC and samples were evaluated based on the information that was provided. The method blank was free of contamination above the reporting limit. The primary laboratory reported that all LCS's were within the laboratory's acceptance limits. The primary laboratory reported that the duplicate and matrix spike were within reasonable QC limits, but no control limits were provided.

9. Data comparison for TDS by Method 160.1 and TSS by Method 160.2.

There was one TDS and one TSS determination. In the TDS determination, there was 100% overall and quantitative agreement. No major or minor data discrepancies were reported. In the TSS determination, there was 100% overall and quantitative agreement. No data discrepancies were noted.

The primary laboratory's QC and samples were evaluated based on the information that was provided. The method blanks for TDS and TSS were free of contamination above the laboratory's reporting limits. The LCS recoveries for TDS and TSS were both within the assumed laboratory's acceptance limits of (90-110%). The primary laboratory did not report any MS/MSD sample results, but the duplicate was within reasonable QC limits. The samples were analyzed within the required holding times.

The QA laboratory's QC and sample results were evaluated based on the information that was provided. The method blanks for TDS and TSS were free of contamination above the laboratory's reporting limits. The LCS's were within reasonable acceptance limits for accuracy, but no QC limits were provided.. The duplicate for TDS was within reasonable acceptance limits for precision. All of the samples were analyzed within the required holding times.

10. References.

a. Data Reports for Shepley's Hill Landfill Long Term Monitoring, Devens, Massachusetts, prepared by the QA laboratory, Severn Trent Laboratories, 208 South Park Drive, Suite 1, Colchester, VT, 05446 and the primary laboratories, Severn Trent Services, 880 Riverside Parkway, West Sacramento, CA, 95605-1500 and Sequoia Analytical, 819 Striker Avenue, Suite 8, Sacramento, CA 95834.

b. EM 200-1-6, Chemical Quality Assurance for Hazardous, Toxic and Radioactive Waste (HTRW) Projects, dated 10 October 1997.

APPENDIX A KEY TO COMMENTS ON DATA COMPARISON TABLES

0 - Data agrees if any one of the following apply:

- both values are less than respective detection limit (N<MDL)

- N₁<MDL₁ and N₂>MDL₂ but <MDL₁*

- both values are above respective detection limit (N>MDL) and difference between two values satisfies conditions below

For all analyses in a water matrix and for metals analysis in soil: <2X difference

For all other soil analyses: <4X difference

1 - Minor contamination by laboratory contaminant

2 - Not tested by both laboratories

3 - Minor data discrepancy, disagreement not serious, if any one of the following apply:

- N_1 < MDL₁ and N_2 > MDL₂ and the difference between values N_2 * does not exceed the upper limit (described below) defining a minor data discrepancy

- both values are above respective detection limit (N>MDL*) and conditions described below apply to the difference between the two values

For all analyses in a water matrix and for metals analysis in soil: 2X<difference<3X

For **all** other **soil** analyses: 4X<difference<5X

4 - Major data discrepancy, disagreement serious, if any one of the following apply:

- N_1 <MDL₁ and N_2 >MDL₂ and the difference between values N_2 and MDL₁* exceeds the limit (described below) defining a major data discrepancy

- both values are above respective detection limit (N>MDL*) and conditions described below apply to the difference between the two values

For all analyses in a water matrix and for metals analysis in soil: >3X difference For all other soil analyses: >5X difference MDL = Method Detection Limit

N = Analytical result

* - not all < values are MDLs. Values which are not MDLs will be noted.

Key to data qualifiers:

B - detected in method blank
DO - Diluted out
J - estimated value, above MDL but below practical quantitation limit
NA - Not analyzed
ND - Not detected
NR - Not reported

APPENDIX B

.

DATA COMPARISON TABLES

.

	0010	DICONTOR	14 0 mar	TDIOTO	D D D D D D P P P	re l	1.00	6.0
	ICOMPA	KISON OF C	A & CON	IRACIO	K KESUL	000	Page I c	12
	PROJEC	1: SHEPLE	T'S HILL	LANDFIL	L, FALL 2	000		1
		-	-		1			
		-			-			
OA SAMPLE No	G0K030223-001	-	0	ONTRAC	TORS SAM	APLE No	436177	
QA FIELD ID	SHM-96-5BOA			CONTR	ACTORS	FIELD ID.	SHM-04	-5B
QA ANALYSIS DATE:	11/16/00	-	CONTR	ACTOR	ANALY	SIS DATE	11/8/00	1
QA LABORATORY	STL-Sacramento		CON	TRACTO	RSLABO	RATORY	STI	-
EXTRACTION METHOD	S030B	-	CON	EXTR	ACTION	WETHOD.	5030B	1
ANALYSIS METHOD:	8260B			AN	ALYSIS	METHOD:	8260B	1
1 1 1 1 1					1		1	1
					(1
	MATERIAL DES	SCRIPTION:	WATER			1	2	4
	DATE	SAMPLED:	11/2/00					1
		UNITS:	ug/L					1
					- I			1
	4							Ĩ.
1	1.	1						
T.		RESULTS	S			RESULTS	C	OMPARIS
PARAMETER	QA LAB	QA LAB	CC	ONTRACT	OR CO	ONTRACTOR		CODE
	LRL		10.000	LRL				1
	1. 2. 1.					1		
		0.000			1			
		12000		1000				
Dichlorodifluoromethane		2.0		< 5.0				0
Chloromethane		9.7		< 5.0				0
Vinyl Chloride		0.65 J	1	< 5.0				0
Bremomethane	<1.0			< 5.0			1.5	0
Chloroethane		2.8			1001	2.8 J		0
Trichlorofluoromethane	< 1.0		5.00	< 5.0	1000	1.2.2.1		0
Acrolein	NR			< 5.0				2
Freon TF	NR		1000	< 5.0		-		2
1,1-Dichloroethene	< 1.0	10.000	1	< 5.0				0
Acetone	< 2.0		14.00	< 5.0				0
Methyl Iodide	NR	-		< 5.0				2
Carbon Disulfide	NR	1.0	· · · ·	< 5.0		in the second second		2
Allyl Chloride	NR			< 5.0				2
Methylene Chloride	< 1.0		1. All 1.	< 5.0				0
Acrylonitrile	NR			< 5.0				2
trans-1,2-Dichloroethene	< 1.0		11000	< 5.0	1.1.1.1			0
1,2-Dichloroethene (total)	NR		1	1		3.0 J		2
Methyl-t-Butyl Ether	NR		1		-	1.4 J		2
1,1-Dichloroethane		1.9		1000	1000	2.3 J		0
Vinyl Acetate	NR	1 1 1 1 1	1.0.00	< 5.0		11-11-1		2
Chloroprene	NR		1	< 5.0				2
cis-1,2-Dichloroethene		2.7				3.0 J		0
2-Butanone	< 2.0		1	< 5.0				0
Proionitrile	NR			< 20	1			2
Methacrylonitrile	NR		1	< 5.0	1			2
Bromochloromethane	<1.0		1	< 5.0				0
Tetrahydrofuran	NR		1.1		1.000	5.2 3		2
Chloroform	< 1.0		1.	< 5.0				0
1,1,1-Trichloroethane	< 1.0		1.0	< 5.0	1000	100 612		0
Carbon Tetrachloride	< 1.0	1		< 5.0				0
Isobutyl Alcohol	NR			< 250			-	2
Benzene	1	0.78 J		< 5.0				0
1,2-Dichloroethane	< 1.0			< 5.0				0
Trichloroethene	< 1.0	1.00		< 5.0	-			0
1,2-Dichloropropane	< 1.0	1	-	< 5.0	-	· · · · ·		0
Methyl Methacrylate	NR			< 5.0				2
Dibromomethane	< 1.0			< 5.0	1			0
1,4-Dioxane	NR		1.	< 250				2
Bromodichloromethane	< 1.0			< 5.0				: 0
2-Chlorocthyl Vinyl Ether	NR	1		< 5.0				- 2
cis-1,3-Dichloropropene	< 1.0			< 5.0	1			0
			1					
		E.	-					
	1 1	SEE APP	ENDIX A	FOR KEY	TOCOM	MENTS		
	1	NR=NOT	REPORT	ED	1			1
		1111-1407	TTTT CHE -					

		COMPA	RISON OF	OA & COI	TRACTO	R RESU	LTS		Page 2 of	2
	P	ROJECT	SHEPLEY	S HILL L	ANDFILL	FALL	2000			
	1	1	1				1		1	
									1	1
						1.000			1	
QA SAMPLE No.: 1	G0K03022	23-001	1	C	ONTRACT	ORS SA	MPLE No .:		436177	4
QA FIELD ID:	SHM-96-5	BQA	1		CONTR/	ACTORS	FIELD ID:		SHM-96-	5B
A ANALYSIS DATE:	11/16/00	-		CONTR	ACTOR'S	ANALY	SIS DATE:		11/8/00	
QA LABORATORY:	STL-Sacra	mento		CON	TRACTOR	'S LABC	DRATORY:		STL	
RACTION METHOD:	5030B		-		EXTR	ACTION	METHOD:		5030B	
INALYSIS METHOD:	8260B		-		AN	ALYSIS	METHOD:	-	8260B	
	-		-				-			1
	MATERI	AL DESC	DIDTION	WATED						
	WATER	DATES	AMPLED.	11/2/00		-	-	-		
		DATES	UNITS:	ng/l		-	-		1	T
			- Crister	-9					-	1
						-		-		
										1
		-	RESULTS				RESULTS		I CC	MPARISON
PARAMETER	QA LAB	1	QA LAB	CC	NTRACT	OR C	CONTRACT	OR	1	CODE
	LRL				LRL			_		
		1				1			1	
	-	1		1				-	-	
		1						-		
4-Methyl-2-pentanone	< 2.0			-	< 5.0	-	-			0
Toluenc	< 1.0				< 5.0	-	-	-	1	0
Fibred Mathematic	<1.0		1		< 5.0		-		-	0
L 1 2 Trichlorosthan	NK	-	-		< 5.0	-	-		-	2
Tetrachloroethene	<1.0	-			< 5.0	-	1	1	1	0
2-Herzhone	NR	-		-	< 5.0	-	-	-	-	2
Dibromochloromethane	<10			-	<50	-	-	-	-	0
1.2-Dibromoethane	<2.0				< 5.0	-	-	-		0
Chlorobenzene	< 1.0	1000	1		< 5.0	1000	1			0
1,1,1,2-Tetrachloroethane	< 1.0		1		< 5.0	V	1			0
Ethylbenzene	< 1.0				< 5.0		10 1	1000		0
Xylene (total)	< 1.0			1	< 5.0		1	1		0
Styrene	< 1.0				< 5.0			1		0
Bromoform	< 1.0	(T)))		1	< 5.0	- C			11	0
Isopropylbenzene	NR			5	< 5.0			1		2
cis-1,4-Dichloro-2-butene	NR			1	< 5.0			1	-	2
1,1,2,2-Tetrachloroethane	NR	-			< 5.0	-				2
1,2,3-Trichloropropane	NR				< 5.0	-	1			2
trans-1,4-Dichloro-2-butene	NR		-	-	< 5.0		-			2
1,3-Dichlorobenzene	NR		10		< 5.0	-	-		-	2
1,4-Dichlorobenzene	1 10	-	1.2		< 5.0	-	-		-	0
1,2-Dichiorobenzene	<1.0				< 5.0		-	-	-	0
1.2 4 Trichlorobenzene	<10		-		<50		-	-	-	0
Hexachlorobutadiene		-	2.7.JB	-	< 5.0		-		-	0
Naphthalene	< 1.0				< 5.0	-		-		0
2,2-Dichloropropane	< 1.0				< 5.0		1000		-	0
1,1-Dichloropropene	< 1.0			1	< 5.0		1	1		0
1,3-Dichloropropane	< 1.0	1		1	< 5.0				1	0
Bromobenzene	NR				< 5.0					2
n-Propylbenzene	NR				< 5.0					2
2-Chlorotoluene	NR	1			< 5.0			-	1	2
4-Chlorotoluene	NR	1		1	< 5.0			-	1.20	2
1.3,5-Trimethylbenzene	NR	-	-	-	< 5.0		-		-	2
tert-Butylbenzene	NR				< 5.0	-	-	-		2
1,2,4-Trimethylbenzene	NR	-	-		< 5.0		-	-		2
sec-Butylbenzene	NR				< 5.0	-	-		-	2
4-Isopropyltolucite	NR	-	-		< 5.0	-	-	-	-	2
1.2.3.Trichlorohouse	NK		-		~ 5.0	-	-	-	+	4
	~ 1.0	-	10	-	1 4 3.0		1		1	1
SURROGATE RECOVERIE	S (%)	OA.	1		1	-	1	-	PRIMAPY	
SUMMOONTE RECOVERIE		- VA	1		-	-	-	1	TRUMPAR	1
4-Brontofluorobeuzene (70-1	30)	105	1		Toluene	8 (88-11	0)	-	97	in the second second
1,2-Dichloroethane-d4 (70-1	10)	100			1.2-Dichl	oroethan	c-d4 (72-14)) .	109	1
Toulene-d8 (70-130)	1.	103	1		Bromoflu	orobenze	me (72-122)	1	1 101	
1		1	1		1,2-Dichl	orobenze	ne-d4 (69-1)	24)	100	
and the second s	1		1		-		1		1	
i and	1		SEE APP	ENDIX A	FOR KEY	TO CON	AMENTS			1
			NR=NOT	REPORT	ED				-	1
	1.000		J=Estimat	ted value g	reater than	one half	the reportin	g limit.	1	1
			1		sector and the sector be		1	1	4	

		1001 0010					-	
1		COMPARI	SON OF Q	A & CON	TRACTOR	RESULTS		
		PROJECT:	SHEPLE	Y'S HILL I	ANDFILL	, FALL 2000		
	-	1						1 1 1
		1						
QA SAMPLE No.::	G0K030223	3-001		CC	ONTRACT(DRS SAMPLE No.:	436177	1
QA FIELD ID:	SHM-96-5B	BQA	-		CONTRA	CTORS FIELD ID:	SHM-96-	5B
QA ANALYSIS DATE:!	11/17/00		1	CONTR	ACTOR'S /	ANALYSIS DATE:	11/27/00	
QA LABORATORY:	STL, Sacran	nento		CONT	RACTOR'	S LABORATORY:	STL, VT	
EXTRACTION METHOD:	3010A				EXTRA	CTION METHOD:	3010A	
ANALYSIS METHOD:	6010B,Hg-7	1470A	1		ANA	LYSIS METHOD:	6010, Hg	-7470
					1			
				Sec. 1				-
	MATE	RIAL DESC	RIPTION:	WATER				
-		DATE SA	AMPLED:	11/2/00	1			
			UNITS:	ug/L			-	
		in a						
				(ii)		-1		
			RESULTS			RESULTS	CC	MPARISON
PARAMETER	QA LAB		QA LAB	CO	NTRACTO	DR CONTRACTOR		CODE
	LRL	-			LRL			1
		1 ·····	2000	1				1.000
							1	
Aluminum	NR			- T - 1	<12.4			2
Antimony	< 10				< 4.6			0
Arsenic			2500	1	A CONTRACTOR OF	2500		0
Barium			50			48.9 B		0
Beryllium	< 5.0	-		1	1	3.9 B		0
Cadmium	< 5.0			1000	< 0.30			0
Calciuum	NR			1.	· · · · · · · · · · · · · · · · · · ·	112000		2
Chromium	< 5.0			S	< 1.0			0
Colbolt			14 B			13.2 B		0
Copper	< 25				< 1.8			0
Iron			23500			25100		0
Lead	< 5.0		-		< 1.8			0
Magnesium	NR			1		16800		2
Manganese			12800			12800		0
Mercury	< 0.20	(11-28-00)			< 0.10	(11-16-00)		0
Nickel			14 B			15.6 B		0
Potassium	NR					8810		2
Selenium	2.32	-	14			6.6		3
Silver	< 5.0				< 1.6			0
Sodium	NR			-		40200		2
Thallium			7.3 B			19.4		3
Vanadium	< 50				< 2.0			0
Zinc	< 20			-	< 3.5			0
							-	
				1			-	
	-	-	SEE APP	ENDIX A	FOR KEY	TO COMMENTS		
			NR=NOT	REPORT	ED		1	
		1	B= Estim	ated result	that is less	than the RI.		

.

-

		1	1				1		
1 1 1		COMPARI	SON OF C	A & CON	TRACTO	RRESU	LTS		
1 1		PROIECT	SHEPLE	Y'S HILL I	ANDFIL	E FALL	2000		
		TROJECT.	ondr bb				1.2000		
							1 1		
And the second s									
OA SAMPLE No	G0K0302	23-001		CC	NTRACT	ORSSA	MPLENO	436177	1
OA FIELD ID:	SHM 06	SDOX	-		CONTRA	CTOPS	FIELD ID:	SHM 06	SP
OA ANAL VSIS DATE:	11/2/00	JUQA		CONTR	ACTORIS	ANALV	SIS DATE:	NP	
OA LABORATORY.	STI See	manto		CONT	DACTOR	INALI DI	DATORY.	CTI VT	
TTRACTION METHOD	NIA	amento		CONT	EYTDA	CTION	METHOD	NA	,
ANALYSIS METHOD.	00124				LAIN	AT VOIO	METHOD.	10010	
ANALISIS METHOD:	9012A				AN	AL 1313	METHOD.	.9010	
	_								
		DILL DEGG	DIRTION	IN A TOP D					
	MATE	CIAL DESC	KIPTION:	WATER					
		DATES	AMPLED:	11/2/00					
	1		UNITS:	mg/L				1	
	-				2	-	-		
							1		
		1	RESULTS	S			RESULTS	CC	MPARISON
PARAMETER	QA LAB	1	QA LAB	CO	NTRACT	OR (CONTRACTOR	/	CODE
	LRL		1		LRL				
		1							
								1	
			-						
Cyanide (CN)	< 0.010				< 0.010				0
1 A							51 I		12411
							1.1		1 1
									1
				1		-			
			-						
			1000						
			-						
	-					-			
	-	-		-	1	1			C-011-
	_			-	2				
		-		-			-		
				-					
		-				-			
	_		-						
					DOD THE				
			SEE APP	ENDIX A	FOR KEY	10 00	MMENTS		
			NR=NOT	REPORT	ED				

- iter		COMPAR	ISON OF Q	A & CON	TRACTOR	R RESULTS			-	1
		PROJECT	SHEPLEY	'S HILL I	ANDFILI	L, FALL 2000				
			-					4		
		-	10.001					2		1
+				0						
QA SAMPLE No.	G0K0302	23-001		CC	DNTRACT	FORS SAMPL	E No.:	436177		i
QA FIELD ID:	SHM-96-	SBQA			CONTRA	ACTORS FIEL	.D ID:	SHM-96-	5B	-
QA ANALYSIS DATE::	11/3/00	1		CONTR	ACTOR'S	ANALYSIS I	DATE:	INR	1.	
QA LABORATORY:	STL, Saci	amento		CON	FRACTOR	R'S LABORAT	ORY:	STL, VT		-
EXTRACTION METHOD:	INA				EXTR/	ACTION MET	HOD:	NA	1	-
ANALYSIS METHOD:	,300.0		1.		AN	ALYSIS MET	'HOD:	300.0		-
			-		1			1		-
							-	1		-
	MATE	RIAL DESC	KIPTION:	WATER				-		-
		DATES	AMPLED:	11/2/00				-		-
	- 1		UNITS:	mg/L						-
			-					-		-
								_		-
			DECIUTO			DE			LIDA DIO	
DADAN (ETTER	101110		RESULIS			RES	SULIS		MPARIS	NU
PARAMETER	QALAB		QALAB		IDI	OR CONT	RACIOR		CODE	-
	LKL		-		LKL			-		-
										-
								-		-
Chinaida Cl		-	50.2.0					-	0	-
Chloride, CL	10.050		50.2 Q		102			-	0	-
Nitrate, as N	< 0.050		-		< 0.2			- C	0	-
Outophosphate, as P	< 0.20		52		< 0.2		= 2		0	-
Sullate, SO4			5.4				5.0		U	-
	-									-
	-							_		-
	-	-	-							-
		-								-
			-					-		-
			-						-	-
				_				-		-
	-			11 miles						-
	-							-		-
			000 1000		COD WET	TO COLOR	TTO			-
			INCH APP	ENDIX A	A FOR KEY TO COMMENTS					1
	-		DED HAT	DEDOT						1
			NR=NOT	REPORTI	ED					

	-	COMPARI	SON OF Q	A & CON	TRACTOR	RESULTS		- 1		
		PROJECT:	SHEPLEY	'S HILL I	ANDFILL,	FALL 2000				
								-		-
			1	1-			-			_
OA SAMPLE No	G0K0302	23-001		CC	NTRACTO	RSSAMPLEN	10 :	436177		-
OA FIFLD ID:	SHM-96-	SBOA			CONTRAC	TORS FIFI D	ID.	SHM-96-	SR	-
OA ANALYSIS DATE	11/3/00	Judit	-	CONTR	ACTOR'S A	NALYSIS DA	TE:	NR		-
OA LABORATORY:	STL. Sact	amento		CON	RACTOR'S	LABORATOR	Y:	STL. VT		-
EXTRACTION METHOD:	NA	1	1		EXTRAC	CTION METHO	DD:	NA		-
ANALYSIS METHOD:	410.4-CO	D			ANA	LYSIS METHO	DD:	410.1-CO	D	-
1 1			10000					1		-
	MATE	RIAL DESC	RIPTION:	WATER				-		
		DATE S.	AMPLED:	11/2/00						_
			UNITS:	mg/L			_			
							-	-		_
							_			_
	-									
			RESULTS	-		RESU	TS	CO	MPARISO	N
PARAMETER	QALAB		QA LAB	CC	NTRACIO	R CONTRA	CTOR		CODE	
_	LRL		-		LKL					-
	-						-	_		
							-	-		-
mical Oxygen Demand (COD)	-	-	175				-		3	-
inical oxygen Demand (COD)	-		11.5							-
	-						-			
			-							-
		-					-			-
	-						-	-		-
		-					-			
			-	-						
		· · · · · · · · ·				1			2.1.1.	
		1	1000							
		1								
			ATT IND	CHIDIV A	FOD VEV T	COMMENT	0			
			SEE APP	ENDIX A	FULLET	O COMMENT	3			

COMPARISON OF QA & CONTRACTOR RESULTS PROJECT: SHEPLEY'S HILL LANDFILL, FALL 2000 QA SAMPLE No.: OOK030221-001 QA AMA/LYSIS DATE: 11/3/00 QA ANALYSIS DATE: 11/3/00 QA ANALYSIS DATE: 11/3/00 QA ANALYSIS DATE: NR QA ANALYSIS METHOD: NA ANALYSIS METHOD: 405.1 MATERIAL DESCRIPTION: WATER DATE SAMPLED: 11/2/00 WATERATION METHOD: 405.1 MATERIAL DESCRIPTION: WATER DATE SAMPLED: 11/2/00 WATERATION METHOD: AANALYSIS METHOD: MATERIAL DESCRIPTION: WATER DATE SAMPLED: ILRL WATER QA LAB CONTRACTOR CONTRACTOR COMPARISON CONTRACTOR PRAMETER QA LAB CONTRACTOR Islogical Oxygen Demand (5 Day) < 6.00 3.5 0 Islogical Oxygen Demand (5 Day)					1	+							
Image: Contract or takes of the contract or takes of takes o			+	-	COMPAN	DISON OF	04 8 00	NTDACT	OD DECLU	170			
QA SAMPLE No.: CORK030223-001 CONTRACTORS SAMPLE No.: 436177 QA FIELD D: SHM-96-SBQA CONTRACTORS SAMPLE No.: 436177 QA ANALYSIS DATE: 11/300 CONTRACTORS SAMPLE No.: 436177 QA ANALYSIS DATE: 11/300 CONTRACTORS LABORATORY: STL, VT QA LABORATORY: STL, Sacramento CONTRACTORS LABORATORY: STL, VT EXTRACTION METHOD: NA EXTRACTION METHOD: NA ANALYSIS METHOD: 405.1 ANALYSIS METHOD: 405.1 MATERIAL DESCRIPTION: WATER 405.1 CONTRACTOR MATERIAL DESCRIPTION: WATER CONTRACTOR COMPARISON VATER IDATE SAMPLED: 11/200 CONTRACTOR CODE VINTIS: mgL IDATE SAMPLED: CONTRACTOR CODE VINTIS: mgL IDATE SAMPLED: IDATE SAMPLED: CONTRACTOR CODE VINTIS: mgL IDATE SAMPLED: IDATE SAMPLED: IDATE SAMPLED: IDATE SAMPLED: IDATE SAMPLED: VINTIS: mgL IDATE SAMPLED: <td></td> <td></td> <td>1</td> <td></td> <td>COMPA</td> <td>RISON OF</td> <td>QA & CO</td> <td>NIRACIO</td> <td>JR RESUL</td> <td></td> <td></td> <td></td> <td></td>			1		COMPA	RISON OF	QA & CO	NIRACIO	JR RESUL				
QA SAMPLE No.: GOK030223-001 CONTRACTORS SAMPLE No.: 436177 QA FIEL DD: SHM-96-3BQA CONTRACTORS STELD DD: SHM-96-3B QA ANALYSIS DATE: 11/300 CONTRACTORS ANALE No.: 436177 QA LABORATORY: STL, Sacramento CONTRACTORS ANALYSIS DATE: NR QA LABORATORY: STL, Sacramento CONTRACTOR'S LABORATORY: STL, VT EXTRACTION METHOD: NA EXTRACTION METHOD: NA ANALYSIS METHOD: 405.1 ANALYSIS METHOD: 405.1 MATERIAL DESCRIPTION: WATER ANALYSIS METHOD: 405.1 MATERIAL DESCRIPTION: WATER Image: Contractor Contrac					ROJECT	SHEPLE	I'S HILL I	LANDFILI	L, FALL Z	000			
QA SAMPLE No.: GOK030223-001 CONTRACTORS SAMPLE No.: 436177 QA FIELD ID: SHM-96-SBQA CONTRACTORS SAMPLE No.: 436177 QA ANALYSIS DATE: 11/3/00 CONTRACTORS SAMPLE No.: NR QA LABORATORY: STL, Sacramento CONTRACTORS LABORATORY: STL, VT EXTRACTION METHOD: NA EXTRACTION METHOD: NA ANALYSIS METHOD: 405.1 ANALYSIS METHOD: 405.1 MATERIAL DESCRIPTION: WATER Image: Contractor			1	-			-						
QA SAMPLE No.: GOK030223-001 CONTRACTORS SAMPLE No.: 436177 QA FIELD ID: SHM-96-SBQA CONTRACTORS SAMPLE No.: 436177 QA ANALYSIS DATE: NIX CONTRACTORS SAMPLE No.: 57L, VT QA ANALYSIS DATE: NIX CONTRACTORS ANALYSIS DATE: NIX QA ANALYSIS DATE: NIX CONTRACTORS ANALYSIS DATE: NIX QA ANALYSIS DATE: NIX CONTRACTORS ANALYSIS DATE: NIX EXTRACTION METHOD: NA EXTRACTION METHOD: NA ANALYSIS METHOD: 405.1 ANALYSIS METHOD: 405.1 MATERIAL DESCRIPTION: WATER Image: Contractors analysis Image: Contractors analysis MATERIAL DESCRIPTION: WATER Image: Contractors analysis Image: Contractors analysis Image: Contractors analysis Image: Contractors analysis Image: Contractors analysis Image: Contractors analysis Image: Contractors analysis Image: Contractors analysis Image: Contractors analysis Image: Contractors analysis Image: Contractors analysis Image: Contractors analysis Image: Contractors analysis Image: Contractors analysis					1						a-ai-		
QA SAMPLE No.: OUKUGU22-901 CONTRACTORS SAMPLE No.: 430171 QA ANALYSIS DATE: I1/3/00 CONTRACTORS NALYSIS DATE: NR QA LABORATORY: STL, scramento CONTRACTORS ANALYSIS DATE: NR QA LABORATORY: STL, scramento CONTRACTORS ANALYSIS METHOD: NA ANALYSIS METHOD: 405.1 ANALYSIS METHOD: 405.1 ANALYSIS METHOD: 405.1 ANALYSIS METHOD: 405.1 MATERIAL DESCRIPTION: WATER Image: Contractor of the scramento Image: Contractor of the scramento DATE SAMPLED: 11/200 Image: Contractor of the scramento Image: Contractor of the scramento Image: Contractor of the scramento Image: Contractor of the scramento Image: Contractor of the scramento Image: Contractor of the scramento Image: Contractor of the scramento Image: Contractor of the scramento Image: Contractor of the scramento Image: Contractor of the scramento Image: Contractor of the scramento Image: Contractor of the scramento Image: Contractor of the scramento Image: Contractor of the scramento Image: Contractor of the scramento Image: Contractor of the scramento Image:		OL CLIMPIEN		00100000	22.001		~		0000041		1000177		
OA NELDID: SHM-96-38/A CONTRACTORS FIELDID: SHM-96-38/A QA NALVSIS DATE: NR CONTRACTORS IABORATORS', STL, VT EXTRACTION METHOD: NA EXTRACTOR STABORATORS', STL, VT ANALYSIS METHOD: NA EXTRACTOR STABORATORS', STL, VT ANALYSIS METHOD: NA EXTRACTOR STABORATORS', STL, VT ANALYSIS METHOD: NA Image: Contractor Staborators', STL, VT ANALYSIS METHOD: NA Image: Contractor Staborators', STL, VT Image: Contractor Staborators', Image: Contractor Staborators', STL, VT Image: Contractor Staborators', Image: Contractor Staborators', Image: Contractor Staborators', Image: Contractor Staborators', Image: Contractor Staborators', Image: Contractor Staborators', Image: Contractor Staborators', Image: Contractor Staborators', Image: Contractor Contractor Contractor Contractor Contractors', Image: Contractor		QA SAMPLE NO	0.:	GOK0302	23-001		u	INTRACI	URS SAN	APLE NO.:	430177	CD.	
QA LANALTSIS DATE: IT1/300 CONTRACTORS ANALTSIS DATE: NR QA LABORATORY: STL, Seramento CONTRACTORS ANALTSIS METHOD: NA ANALYSIS METHOD: NO ANALYSIS METHOD: 405.1 ANALYSIS METHOD: 405.1 MATERIAL DESCRIPTION: WATER Interview Interview Interview Interview Image: Interview Image: Interview Image: Interview Image: Interview Image: Interview Image: Interview Image: Interview Image: Interview Image: In		QA FIELD I	0:	SHM-96-	SBQA		001/770	CONTRA	ACTORS	FIELD ID:	SHM-90-:	зв	
OVAL CABORATIONY: STL, VI EXTRACTION METHOD: NA EXTRACTION METHOD: NA ANALYSIS METHOD: 405.1 ANALYSIS METHOD: 405.1 MATERIAL DESCRIPTION: WATER 1 1 DATE SAMPLED: 11/200 1 1 MATERIAL DESCRIPTION: WATER 1 1 DATE SAMPLED: 11/200 1 1 WATER NA 1 1 1 MATERIAL DESCRIPTION: WATER 1 1 1 DATE SAMPLED: 11/200 1 1 1 1 MATERIAL DESCRIPTION: WATER 1 1 1 1 WATER RESULTS RESULTS COMPARISON 1<	QA.	ANALYSIS DAT	E:	11/3/00		-	CONTR	ACTORS	ANALYS	IS DATE:	NK NK		
EXTRACTION METHOD: NA EXTRACTION METHOD: NA ANALYSIS METHOD: 405.1 ANALYSIS METHOD: 405.1 MATERIAL DESCRIPTION: WATER 1000000000000000000000000000000000000	Q	ALABORATOR	Y:	STL, Saci	ramento		CON	TRACION	CS LABO	RATORY:	SIL, VI		
ANALYSIS METHOD: 405.1	EXIKA	CTION METHO	D:	NA		1		EXIR	ACTION	METHOD:	NA		
MATERIAL DESCRIPTION: WATER	ANA	ALYSIS METHO	D:	405.1				AN	ALYSIS N	METHOD:	405.1		
MATERIAL DESCRIPTION: WATER			1	-				1					
MATERIAL DESCRIPTION: WATER DATE SAMPLED: 11/200 UNITS: mg/L RESULTS RESULTS RESULTS RESULTS COMPARISON PARAMETER QA LAB QA LAB QA LAB CONTRACTOR COMPARISON PARAMETER QA LAB CONTRACTOR CONTRACTOR COMPARISON Sidolgical Oxygen Demand (5 Day) < 6.00													
DATE SAMPLED: 11/2/00			1	MATERI	AL DESC	RIPTION:	WATER						-
UNITS: mg/L Image: Contraction Image: Contraction PARAMETER QA LAB QA LAB QA LAB CONTRACTOR CONTRACTOR Image: Contraction CODE Image: Contraction Contraction Image: Contraction Image: Contraction					DATES	AMPLED:	11/2/00						
PARAMETER QA LAB QA LAB CONTRACTOR COMPARISON PARAMETER QA LAB QA LAB CONTRACTOR COMPARISON LRL LRL LRL LRL IIII isiological Oxygen Demand (5 Day) < 6.00	1	Ĩ	X			UNITS:	mg/L						
RESULTS RESULTS RESULTS COMPARISON PARAMETER QA LAB QA LAB CONTRACTOR CODE LRL LRL LRL CONTRACTOR CODE islongical Oxygen Demand (5 Day) <6.00			-										
PARAMETER QA LAB QA LAB QA LAB CONTRACTOR COMPARISON PARAMETER QA LAB QA LAB CONTRACTOR CONTRACTOR CODE Indicator Indicator Indicator Indicator Indicator Indicator Indicator Indicator Indicator Indicator Indicator Indicator Indicator In	1	1	1				_			1.1.1			
PARAMETER QA LAB QA LAB CONTRACTOR CONTRACTOR COMPARISON IRL IRL <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>12.000</td> <td>1.000</td> <td></td> <td></td> <td></td>									12.000	1.000			
PARAMETER QA LAB QA LAB CONTRACTOR CODE LRL LRL LRL LRL IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII					-	RESULTS				RESULTS	CO	MPARISC	ON
IRL IRL IRL IRL IRL iological Oxygen Demand (5 Day) < 6.00]	PARAMETER		QA LAB		QA LAB	CC	NTRACT	OR CO	NTRACTOR		CODE	
iological Oxygen Demand (5 Day) < 6.00				LRL				LRL					
SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED							11	1.0		1			
Siological Oxygen Demand (5 Day) < 6.00													
Sidogical Oxygen Demand (5 Day) < 6.00	_		-					5					
	Biological	Oxygen Demand	(5 Dav)	< 6.00						3.5		0	
Image: See Appendix A FOR KEY TO COMMENTS	Bione	onj gon Domano	(D Duj)										
Image: Second			-	-	1								
Image: Set appendix a For key to comments Image: Set appendix a For key to comments			-	-			-						
Image: See Appendix A FOR KEY TO COMMENTS Image: See Appendix A FOR KEY TO COMMENTS		1	-	-		-							
SEE APPENDIX A FOR KEY TO COMMENTS				-		-							
Image: Second			-	-									
Image: See Appendix A FOR KEY TO COMMENTS			-	-								-	
Image: See Appendix A FOR KEY TO COMMENTS Image: See Appendix A FOR KEY TO COMMENTS			-										
Image: See Appendix A FOR KEY TO COMMENTS			-	-									
Image: See Appendix A For Key to Comments NR=NOT REPORTED			-						1.3				
Image: See Appendix A For Key to Comments NR=NOT REPORTED	-			-									
Image: See Appendix A For Key to Comments NR=NOT REPORTED			-	-	1								
SEE APPENDIX A FOR KEY TO COMMENTS						1				A			
SEE APPENDIX A FOR KEY TO COMMENTS													
SEE APPENDIX A FOR KEY TO COMMENTS			_	-					1				
SEE APPENDIX A FOR KEY TO COMMENTS			-						1		r		
SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED			-					1					
SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED					1								-
SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED			1.000	1			-				2		
SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED					1		1		1				
NR=NOT REPORTED				1	1	SEE APP	ENDIX A	FOR KEY	TO COM	MENTS		1	
						NR=NOT	REPORT	ED					

_	1		1	-	1	i					
	-			001010101	0010000		TRA OTO	DEGUI			
-			1	DROJECT	SON OF Q	A & CON	ANIDEU	RRESUL	15		
				PROJECT	SHEPLE	IS HILL L	ANDFIL	L, FALL 2	2000		
			1000		-	-		-			
	-		1		-						
	DASAN	PI E No 1	G0K0302	23.001	-	0	NTPACT	OPCCAN	PIE No .	436177	
	OA F	TELD ID-	SHM-06-	5BOA			CONTRA	CTORS	FIFLD ID	SHM-06-	R
0A	ANALYS	IS DATE:	11/3/00			CONTRA	CTORS	ANALVS	IS DATE:	NR	
(ALABOR	ATORY	STI Sac	ramento		CONT	RACTOR	SLABOI	RATORY	STI VT	
EXTR	ACTIONN	IETHOD-	NA			CONT	EXTRA	CTION	AETHOD.	NA	
AN	ALYSIS N	IETHOD:	310.1				AN	ALYSIS N	AETHOD:	310.1	
		ibinob.	510.1					1210101	LICE.	51011	
-			-		-						1000
		1	MATE	RIAL DESC	RIPTION	WATER					11-22
				DATES	AMPLED:	11/2/00					
		4			UNITS:	mg/L					1
_											
		*			1	1					
							1				
-	1.1.1		-		RESULTS	S			RESULTS	CO	MPARISON
	PARAME	TER	OA LAB		OA LAB	CO	NTRACT	OR CO	ONTRACTOR		CODE
			LRL			1	LRL				
-											A
					-						
100				1	1.0.0	1.	1				
	Total Al	kalinity as CaCO3		-	363		1		392		0
							-				
				-							
				· · · · · · · · · · · · · · · · · · ·							
				1		1		1.1			
100				1							
_									1	< 6 Con - 1	
1				1		1.000	1.1.1.1				
				2 — I							
1	1			0	12	1				12. J. 1. 1. 1.	
				200	0						
				1.000	1	1					
	-		-			1	1-1-1				
				P							
					SEE APP	ENDIX A	FOR KEY	TO COM	IMENTS		
			1		NR=NOT	REPORT	ED				

			1	1			-			
-			COMPAR	ISON OF	DA & CON	TRACTO	RESI	TS		
			PROIFCT	SHEPLEY	VSHILL	ANDEIL	L FALLS	2000		
-			I ROJECT.	SILLI DE						
-				-						
10	A CAMPLE No.	COVO2	0000	-	00	NITDACT	ODC CAN	IDI C Ma	426177	
- 4	A SAMPLE NO.	GUKUS	6 5004		cu	CONTRACT	UKS SAN	IPLE NO.:	4301//	(D)
04 41	QA FIELD ID:	SHM-9	D-3BQA		CONTO	CUNIK	ACTORS	TELD ID:	SHM-90-	28
QAAN	ALISIS DATE:	11/3/00	1		CONTRA	ACTORS	ANALYS	IS DATE:	INK OTT	
QAI	LABORATORY:	STL, Sa	cramento		CONT	RACTOR	SLABO	CATORY:	SIL, VI	
XIRACI	ION METHOD:	NA				EXTRA	ACTION N	AETHOD:	NA	
ANAL	YSIS METHOD:	130.2		0		AN	ALYSIS N	IETHOD:	130.2	
	1			-	1		10. A.			
-				1.000						
		MATE	ERIAL DESC	RIPTION:	WATER		P			
			DATE SA	AMPLED:	11/2/00	1		1		
				UNITS:	mg/L	11	1 44			
			1							
			1	10 - C. 100	1.000	12.0.00	1		1	
			15		-					
	1		11	RESULTS				RESULTS	CC	MPARISON
PA	RAMETER	OALA	B	OALAB	CO	NTRACT	OR CC	NTRACTOR		CODE
		IRI	~	Que Di Lo		IRI				0022
		DICE				LICE	-			
			-							
			-							
			-	250				410		0
10	tal Hardness as C	acus	-	350		-		410		0
			1			-				
			1			_				
			-	1						
1					1			1		
			1				1			
							1.000			
				-			1			
			1			********				
			1				1. Carlos			
				-			1			
			1	1 2 3		1			1.1.1.1	
						5				
							1			
-			-				1			
-			-							
_	-		-				-		-	
			-							
-			-	SEE APP	ENDIX A	FOR KEY	TO COM	MENTS		
			1.1.	NR=NOT	REPORTI	ED				

				-		-	1		
	(COMPARI	SON OF C	DA & CON	TRACTO	RRESU	TS		
		PROJECT:	SHEPLEY	S HILL I	LANDFIL	L. FALL	2000	-	
	1	. norbern	0.101 00						
	-	1				-			
	÷					-			
OA SAMPLE No .:	G0K0302	23-001		CC	NTRACT	ORS SAM	MPLE No .:	436177	
OA FIELD ID:	SHM-96-	5BOA			CONTRA	CTORS	FIELD ID:	SHM-96-	SB
QA ANALYSIS DATE:	11/3/00	1		CONTR	ACTOR'S	ANALYS	SIS DATE:	NR	
QA LABORATORY:	STL. Sac	ramento		CONT	TRACTOR	S LABO	RATORY:	STL, VT	
EXTRACTION METHOD:	NA		1		EXTRA	CTION I	METHOD:	NA	
ANALYSIS METHOD:	160.1 and	160.2			AN	ALYSIS I	METHOD:	160.1 and	160.2
				-					5. Contraction 19
	MATER	IAL DESC	RIPTION:	WATER					1
		DATES	AMPLED:	11/2/00				*	
		1.11	UNITS:	mg/L		1			
		1			2				
	1.0					1			
					1	1			
			RESULTS			1.1.1.1.1	RESULTS	CO	MPARISON
PARAMETER	QA LAB		QA LAB	CC	NTRACT	OR CO	ONTRACTOR		CODE
	LRL	14-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-			LRL		1.		5
						1			
					1		1		
and the second second					(1			
tal Dissolved Solids (TDS by 160.1)		1	467				494		0
tal Suspended Solids (TSS by 160.2)	X		50.0			1	44.2		0
						1			
					-				
					1.1				
		200			· · · · · · · · · · · · · · · · · · ·		1		
		1	-		1	11			
and the second sec		17							
							2.	- CA. 10	7.221
		1				1			
					1				1
		1 1			-		1		1.1.1.1
		1							
				-					
			SEE APP	ENDIX A	FOR KEY	TO CON	IMENTS		
			NR=NOT	REPORT	ED		1.2.2.1		

.
APPENDIX C

SAMPLE RECEIPT & CUSTODY DOCUMENTATION

.

			Rep	ort t	o:	In	voice to	0		-	1	A	ALVO	10	1	7	T	F	1	1	TI	1	Lab'use (only
Co	moan	v: US	Am	AL G	mos of Frances	Company:						RE	DUES	STEC	. /	1	1:	Tes.	/	11	1 /	1	Due Date	
A	ddres	s: 69	L V	מואמו	in Road	Address:								1	1	1	10		1	1	1	11		
		6	ncal	2,1	MA 01742										13	1	7	1	1	/	/	//	Temp. of c	oolers
C	Contac	a: M	Nie	w.	itas	Contact:								1	Fer	1	.0]	1	/	/		//	1 5 3	14
	Phon	e: <u>9</u>	18-	318	- 8175	Phone:								1	S	1	7	1	/ /	/ /	1	1	Custody S	eal N
C	Fa	x: 1	18-	318	- 8663	PO/SO #:					-			1	Ŧ	a Linit	1/	1	/	1	/	/	Intact	N
Sam	pler's N	#: lame	P	114		Sampler's Signalure			- 1-	_	-		8	401	1g	ALL	00	1	./	/			For Radioac	tivity L
Ta	LK '	Keer	nan			Parchs for	-						Ze	2	30	st	9	1.	4	/ /	1			
Proj.	No.	10.00	Proj	ect Na	ame	1 mg	N	о Луре	of Co	ntaine	152		1	the .	1 7	19	Sol	100	1	1	1			
E	\$77	6	52	eple	y's Hill LTM	. + M		-	- 1		_	ŝ	7 3	1 .	77	1	1	5/	1	1	1			
alrix'	Dale	Time	DOE P	r a b	Identifying Marks of	Sample(s)	v	/OA 1	NG LI.	250 ml	P/O	4	1-Jul	J	Bai	3/	al F	5/			1	Lab Sa	mple ID (Lab	Use Onl
v	11-02-0	1/250		X	SHM .96 - 3	SBQA		3	_		6	3	1	1	11	1	1							
V	1-02-00	-		X	Trip Blan	14	-	1	-	_	_	1			_								-	
	_			4				-	-	_	-		-	-	_	-		-				_		
	_		1	_				_	-	_	_	-	_	-	-	-	-	-	_		_			
_		-	<u> </u>	_				-	-	-	-	-	-	+		-	-	-			-			
		X	-	-	-			-	-	-	-	-	-	+		-	-	-	-	-				
	Y		-	-			-	-			-	-	_	-	+	+	-	-			-	-	*	
-	\vdash		-	-				-	-	-	-	-		+	-	+	-	-	-	-	40			
7			-	-					-	-		-	-			+	-	-	-	-	4			
	-	_			<u> </u>				_			_			_	1	_	1	L					
			<u>.</u>		i.	Desited to	(6:		~	1.	Data	_	Time	. 1	Dem	a di a	_			_				
Kenn	H.A.	a by: (:	na.		11-07-00 14	30 SILL RO	TSIgnature	5-4 2	59		Jaie:	1	TIME		Hem	BIKS								
Dalia	quishe	d by: (Signa	lure)	Dale: T	ime: Received by:	(Signature	e)		1	Date:	1	Time	9:		1	C	0	SIE	R				
19111										-			T	_				-						

÷.

(802) 655-1248

Chain of		
Custody	Reco	ora



Severn Trent Laboratories, Inc.

.

.

STL-4124 (0700)		11		10	_	¢	-												-	
STL-SAC	-		Projec	I Mar	4.	100	2	. 5	30	FO	A	6	5			Dale 11-3-0	20	Chain of C	islody Numl	05299
Address			Talopi	horfe	NUm	Obr (Area	Code	//Fax	Num	ber		-			Leb Number		Page		of
City S	late Zij	o Code	Site C	ontec	nt -		ł		Løb (Conta	cl	-				Analysis (Atlach list if more space is needed)				
Project Name and Location (State)		1	Carria	r/Way	ybill I	Vumt	ber					-							anial Inci	evoliona/
Contract/Purchase Order/Quote No			4		1	Matri	ix			Co	ontair eserv	ners valiv	&		3			Co	nditions o	f Receipt
Sample I.D. No. and Description (Containers for each sample may be combined of	n one line	Date	Time	1	Vitreeord	Sed	205		Unpres.	HISON		HORN	ZaAc	L	100					
GOK 630723	-1	11-2-00	1250		×										X			30	1107	16-01
	-			-		-	-		-	-		-	-				_			
					-	-	-		+	+	-	+	+	+						
					-					1		T		1				1100		
																			1	
						-	-		-	-		-	-	-						
		0.1	-	+	-	-	-	\vdash	+	+	-	-	+	+						
								H		1	T	1	17	1					1	
																			-	
															04.00					
Possible Hazard Identification Non-Hazard Flammable Skin	Irrîtant	Polson B	Unknow	n [Samp] R	etum	ispos To (al Client	E] Dis	posal	By	Lab	Ĕ	Archive For	Months longer li	hay be es han 3 mic	sessed II sam onlhs)	ples are rela	bined
Turn Around Time Required					10.1				1	DC R	equire	mer	nts (S)	pacil	Y)	1		- 1		
1 Relinguistical By	140	Days L 21 Dey:	Date	her_	00	1	me	30	2	I. Roo	celved	1 By	1	À	KANO),		Date		12
2 Rulinquishud By			Date	2-1	~	Ti	me	1	-	Red	calved	187	-		YUND			Date	1	ing
3 Rolinquished By	-		Date		-	1	mə	-	-	B. Rec	celvec	By		~				Date	T//	ne
Comments						<u> </u>	6					-	-	-						

à.

1 80

9 A 1

+ (ja

				TRE	N.E.
LOT RIECEIP' STL Sacramento	T CHECKLIST		1	SERVI	CES
CLIENT USAC	0E		_PM_DB LOG #	6335	
LOT# (QUANTIMS	D) GOKOZ	OZZ QUOTE	# 30186 LO	CATION 412	201
				Initials	Date
DATE RECEIVED	11-3-00		125	GC	11-3-00
DELIVERED BY	S.FEDEX	CA OVERNIGHT			
		GOLDENSTATE			
		BAX GLOBAL	GO-GETTERS		
		🗌 В & В	OTHER		
CUSTODY SEAL ST			I/A	-	
CUSTODY SEAL #(S) TAPE				
SHIPPPING CONTA	INER(S) 🔲 STL		J/A		
TEMPERTURE REC	ORD (IN °C) IR	1 2 🗹 🗆	OTHER		
COC #(S)			1.		_
TEMPERATURE BL	ANK				
AMBIENT TEMPER	ATURE 4	/	- <u>t</u>		
COLLECTOR'S NAM		erified from COC	Not on COC		
OH MEASURED			Y ZNA		4
LABELED BY				CIA	
ABELS CHECKED	ΒΥ				
SHORT HOLD TEST	NOTIFICATION	SAM	IPLE RECEIVING	-M	\rightarrow
Ξ.		WET	CHEM 🗌 N/A	-KW	
METALS NOTIFI	ED OF FILTER/PRESE	RVE VIA VERBAL & EM.		CNP .	
APPROPRIATE	Pment received in (Temperatures, con	GOOD CONDITION WIT	H 🗌 N/A IVES	$-\mathbf{k}$	- \ -
] Clouseau		TURE EXCEEDED (2 *-6	5 °C) DN/A	60	11-3-00
		GEL PACK			
WET ICE		NG AGENTS USED			
WET ICE					

LEAVE NO SPACES BLANK. USE "NA" IF NOT APPLICABLE. INITIAL AND DATE ALL "NA" ENTRIES.

15

QA185 8/00 NEK

.

 (\mathbf{z})

9

APPENDIX G

GROUNDWATER ANALYTICAL DATA

3.5 inch diskette (not included in all reports)

APPENDIX H REFERENCES

APPENDIX H

REFERENCES

Stone & Webster Environmental Technology & Services, 1996. Long Term Monitoring and Maintenance Plan, Shepley's Hill Landfill, Fort Devens, Massachusetts. Prepared for the U.S. Army Corps of Engineers, New England Division. March

Stone & Webster Environmental Technology & Services, 1997. Shepley's Hill Landfill, Annual Report 1996, Devens, Massachusetts. Prepared for the U.S. Army Corps of Engineers, New England Division. April

Stone & Webster Environmental Technology & Services, 1998. Final Five Year Review, Shepley's Hill Landfill, Long Term Monitoring, Devens, Massachusetts. Prepared for the U.S. Army Corps of Engineers, New England District. August

Harding Lawson Associates, 1999. Final Work Plan – Supplemental Groundwater Investigation at Shepley's Hill Landfill, Devens Reserve Forces Training Area, Devens, Massachusetts. Prepared for the U.S. Army Corps of Engineers, New England District. February

Harding Lawson Associates, 2000. Draft Shepley's Hill Landfill Supplemental Groundwater Investigation, Devens Reserve Forces Training Area, Devens, Massachusetts. Prepared for the U.S. Army Corps of Engineers, New England District. July

U.S. Army Corps of Engineers, New England District (CENAE), 2000. Semi-Annual Groundwater Analytical Report, Spring 2000, Shepley's Hill Landfill, Long Term Monitoring, Devens, Massachusetts, September

U.S. Army Corps of Engineers, New England District (CENAE), 2000. 1999 Annual Report, Shepley's Hill Landfill, Long Term Monitoring and Maintenance, Devens, Massachusetts, March

U.S. Environmental Protection Agency (USEPA) Region 1, 1996. Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples From Monitoring Wells, SOP #: GW 0001, Revision 2. July 30.

ABB Environmental Services, Inc. (ABB-ES), 1993. *Final Remedial Investigation Addendum Report*, Fort Devens Feasibility Study for Group 1A Sites. Prepared for the U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland. Portland, Maine. December.

ABB Environmental Services, Inc. (ABB-ES), 1995a. *Final Feasibility Study, Shepley's Hill Landfill Operable Unit*, Fort Devens Feasibility Study for Group 1A Sites. Prepared for the U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland. Portland, Maine. September.

ABB Environmental Services, Inc. (ABB-ES), 1995b. Record of Decision, Shepley's Hill Landfill Operable Unit, Fort Devens Feasibility Study for Group 1A Sites. Prepared for the U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland. Portland, Maine. September.

CLIENT Severn TI	ent Labs	P	M DB	LOG # G9EN	2-9
LOT# (QUANTIMS ID) _ G9	E120181	QUOTE # 301	86		122CV
				Initials	Data
DATE RECEIVED 051299	TIME RECEIVED	0930		R	<u>05729 9</u> .
		ібнт 🗆	CLIENT		ſ
	IRNE GOLDENST		DHL	1	1
UPS	BAX GLOBA		GO-GETTERS		
	OURIER OTHER				
		-			
				1. IV	100
SHIPPPING CUNTAINER(S)					
EMPERTURE RECORD (IN °C)				- 1	
지수는 가슴이 좀 하고 잘 들었는 것, 것 것 같아요. 것 하지도 않았는 것 같아요. 한 것 같아요. 이 것 ? 이 것 ? 이 ? 이 ? 이 ? 이 ? 이 ? 이 ? 이 ?					
COC #(S)	NIA				
COC #(S) TEMPERATURE BLANK				-	÷
COC #(S) TEMPERATURE BLANK IMBIENT TEMPERATURE	NIA 3°C				<u>;</u>
COC #(S) TEMPERATURE BLANK AMBIENT TEMPERATURE NH MEASURED	NI/4- 3°C- YES QA	ANOMALY	[⊠] NIA		·
COC #(S) TEMPERATURE BLANK AMBIENT TEMPERATURE IH MEASURED ABELED BY	NI/4- 3°C- VES 04	ANOMALY	⊠ .₩A		·
COC #(S) TEMPERATURE BLANK AMBIENT TEMPERATURE IH MEASURED ABELED BY ABELS CHECKED BY	NI/4- 3°C VES 04	NOMALY	⊠ N/A	at y	· · · · · · · · · · · · · · · · · · ·
COC #(S) TEMPERATURE BLANK AMBIENT TEMPERATURE H MEASURED ABELED BY ABELS CHECKED BY	NI/A- 3°C- Q YES Q A	ANOMALY Sample Recei	[<mark>⊠] N/A</mark> IVING		
COC #(S) TEMPERATURE BLANK AMBIENT TEMPERATURE IH MEASURED ABELED BY ABELS CHECKED BY		ANOMALY SAMPLE RECEI WETCHEM	IVING	de de t	
COC #(S) TEMPERATURE BLANK AMBIENT TEMPERATURE TH MEASURED ABELED BY ABELS CHECKED BY THORT HOLD TEST NOTIFICATION	NIIA 3°C VES A	ANOMALY SAMPLE RECEI WETCHEM		AN ME DAS	
COC #(S) TEMPERATURE BLANK AMBIENT TEMPERATURE TH MEASURED ABELED BY	NIA 3°C 3°C VES A	ANOMALY SAMPLE RECEI WETCHEM		At A	
COC #(S) CEMPERATURE BLANK CAMBIENT TEMPERATURE H MEASURED ABELED BY ABELS CHECKED BY HORT HOLD TEST NOTIFICATION METALS NOTIFIED OF FILTER/ COMPLETE SHIPMENT RECEIV APPROPRIATE TEMPERATURES Clouseau	NIA 3°C 3°C VES A PRESERVE VIA VERBAL & EMAIL ED IN GOOD CONDITION WITH S, CONTAINERS, PRESERVATIVES TEMPERATURE EXCEEDED (2 °-6	ANOMALY SAMPLE RECEI WETCHEM		AN ME DAS	
COC #(S) TEMPERATURE BLANK AMBIENT TEMPERATURE IH MEASURED ABELED BY	NIA- 3°C YES YES PRESERVE VIA VERBAL & EMAIL ED IN GOOD CONDITION WITH S, CONTAINERS, PRESERVATIVES TEMPERATURE EXCEEDED (2 °-6 BLUE ICE GEL PACK	ANOMALY SAMPLE RECEI WETCHEM	IVING IVING IN/A IN/A IN/A	Me de	
COC #(S) TEMPERATURE BLANK AMBIENT TEMPERATURE IH MEASURED ABELED BY	NIA- 3°C YES YES PRESERVE VIA VERBAL & EMAIL ED IN GOOD CONDITION WITH S, CONTAINERS, PRESERVATIVES TEMPERATURE EXCEEDED (2 °-6) BLUE ICE GEL PACK NO COOLING AGENTS USED	ANOMALY SAMPLE RECEI WETCHEM		AL AL AL	

LEAVE NO SPACES BLANK. USE "N/A" IF NOT APPLICABLE. INITIAL AND DATE ALL "N/A" ENTRIES.

QA 185 02/99 RAL

Wuanterra

Chemical Quality Assurance Report Fall 1999

SHEPLEY'S HILL LANDFILL LONG TERM MONITORING DEVENS, MASSACHUSETTS

CHEMICAL QUALITY ASSURANCE REPORT No. E0776-021100

NOVEMBER 2, 1999 SAMPLING EVENT

PREPARED BY THE ENVIRONMENTAL ENGINEERING AND GEOLOGY SECTION ENGINEERING/PLANNING DIVISION

DEPARTMENT OF THE ARMY NEW ENGLAND DISTRICT, CORPS OF ENGINEERS CONCORD, MASSACHUSETTS

FERUARY 11, 2000

SHEPLEY'S HILL LANDFILL LONG TERM MONITORING DEVENS, MASSACHUSETTS NOVEMBER 2, 1999 SAMPLING EVENT

CHEMICAL QUALITY ASSURANCE REPORT No. E0776-021100

TABLE OF CONTENTS

Paragraph	Title	Page
	Executive Summary	1-2
	Table 1- Data Comparison Summary	3
	Table 2 - Analyses Performed by QA Laboratory	4
1.	QA sample shipping and chain-of-custody deficiencies	5
2.	Data comparison for volatiles by Method 8260	5-6
3.	Data comparison for metals by Method 6010 and 7470	6-7
4.	Data comparison for cyanide by Method 9010B	7
5.	Data comparison for anions by Method 300.0	7-8
6.	Data comparison for COD and BOD by Method 410.4 and 405.1	8
7.	Data comparison for alkalinity by Method 310.1	8
8.	Data comparison for hardness by Method 130.2	8-9
9.	Data comparison for TDS and TSS by Methods 160.1 and 160.2	9
10.	References	9
	Appendix A - Key to comments on Data Comparison Code	
	Appendix B - Data Comparison Tables	
	Appendix C - Custody Documentation	

SHEPLEY'S HILL LANDFILL LONG TERM MONITORING DEVENS, MASSACHUSETTS NOVEMBER 2, 1999 SAMPLING EVENT

CHEMICAL QUALITY ASSURANCE REPORT No. E0776-021100

Executive Summary

QA samples from one shipment for Shepley's Hill Landfill Long Term Monitoring, Devens, Massachusetts were analyzed by the QA laboratory, resulting in a total of 76 target analyte determinations. The shipment contained two QA water samples and was received in good condition. The data report from STL (Severn Trent Laboratories), dated 1 December 1999 was used in the comparison. In 25 of these determinations analytes were detected by one or both laboratories. Results from the analysis of QA samples were compared with results from analysis of the corresponding primary samples (Reference 10A). The primary and QA samples agreed overall in 72 (94.7%) of the comparisons. Primary and QA samples agreed quantitatively in 21 out of 25 (84.0%) of the comparisons. Quantitative agreement represents only those determinations where an analyte was detected by at least one laboratory. One major and three minor discrepancies between results from the primary and QA samples were noted. Refer to Table 1 for a QA split sample data comparison summary.

The QA laboratory's QC samples contained all of the necessary information and a complete evaluation was performed. All of the data comparisons for Methods VOA's-8260, TAL Metals-6010, CN, Anions, COD, BOD, Alkalinity, Hardness and TDS were in good overall and quantitative agreement. There were only three minor data discrepancies noted for metals. All the other quantitative results compared almost identically for all of the target analytes that were reported as hits. There was very little bias to any of the sample results and the data appears to be complete and useable, except for the TSS determination. There was one major discrepancy for the TSS result in which the QA laboratory reported 5.0 mg/L and the primary laboratory reported 44.6 mg/L. Based on the evaluation of both laboratory's QC data, no reasonable explanation can be offered for this major discrepancy.

The primary laboratory's data report contained all of the necessary information and a complete evaluation was performed. As stated above, all of the data comparisons for the majority of the analyses were in good overall and quantitative agreement, except for the TSS determination. The rest of the sample results for all of the analyses were supported by the QC data and appear to be complete and useable. The primary laboratory reported the samples in which tentatively identified compounds (TIC's) were detected, but did not specify their possible identification or the number of TIC's detected in each sample. This CQAR is based on the laboratory reporting limits because the detection limits were not provided.

QA analyses were performed by Quanterra Environment, Services, 880 Riverside Parkway, West Sacramento, CA, 95605 and CLS Labs, 3249 Fitzgerald Road, Rancho Cordova, CA, 95742 (see Table 2 for analyses performed by the QA lab). The primary laboratory was Severn Trent Laboratories, 55 South Park Drive, Colchester, VT, 05446.

<u>Table 1</u> <u>Quality Assurance Split Sample</u> <u>Data Comparison Summary</u>

Project: Shepley's Hill Landfill Long Term Monitoring, Devens, Massachusetts, November 2, 1999 Sampling Event

	Overall	(1)	Quantitati	ve
Test	Agreemen	t (1)	Agreeme	nt (2)
Parameter	Number	Percent	Number	Percent
voc	47/47	100	7/7	100
METALS	15/18	83.3	8/11	72.7
CYANIDE	1/1	100	NA	NA
ANIONS	4/4	100	2/2	100
COD	1/1	100	1/1	100
BOD	1/1	100	NA	NA
ALKALINITY	1/1	100	1/1	100
HARDNESS	1/1	100	1/1	100
TDS	1/1	100	1/1	100
TSS	0/1	0	0/1	0
Total	72/76	94.7	21/25	84.0

NOTES:

(1) Represents the number and percentage agreement of all determinations including analytes not detected by either laboratory.

(2) Represents the number and percentage agreement of only those determinations where an analyte was detected by at least one laboratory.

TABLE 2

QA ANALYSES PERFORMED

SAMPLE ID	MATRIX	SAMPLE DATE	ANALYSIS
MW-SHM-96-5B-QA-99-02	WATER	11/2/99	VOC,METALS,CN, ANIONS,COD,BOD,ALK, HARDNESS,TDS,TSS
TRIP BLANK	WATER	11/2/99	VOC

SHEPLEY'S HILL LANDFILL LONG TERM MONITORING DEVENS, MASSACHUSETTS NOVEMBER 2, 1999 SAMPLING EVENT

CHEMICAL QUALITY ASSURANCE REPORT No. E0776-021100

QA Findings

1. QA sample shipping and chain-of-custody deficiencies.

One shipment containing two QA water samples was received by Quanterra Environmental Services, West Sacramento, CA, on 3 November 1999. Proper sample handling protocols were followed for this shipment.

A copy of the chain-of-custody form document and cooler receipt form is appended to this report for reference.

2. Data comparison for volatiles (VOC) by Method 8260.

There were 47 volatile determinations. In seven of these determinations, target analytes were detected by one or both laboratories. There was overall agreement in 47 (100%) of the cases and quantitative agreement in seven out of seven (100%) of the cases. No major or minor data discrepancy were noted.

The QA laboratory's QC samples were within the acceptance limits for all of the target analytes and a complete evaluation was performed. The method blank and the trip blank were free of contamination above the laboratory's reporting limit for all of the target analytes. All of the samples, LCS/LCSD's, method blank, and trip blank surrogates recoveries were within the laboratory's acceptance limits. All of the LCS/LCSD's target analytes were also within the acceptance limits for accuracy and precision. The QA laboratory only spiked five of the target analytes into the LCS/LCSD. The QA laboratory was not requested to perform MS/MSD's and no evaluation of accuracy and precision due to matrix effects could be determined. All of the samples were analyzed within the required holding times. The QA laboratory's reporting limits were approximately five times lower than the primary laboratory.

The primary laboratory's QC samples contained all the necessary information and a complete evaluation was performed. The method blanks and the trip blanks were free of contamination above the laboratory reporting limit for all of the target analytes. The primary laboratory reported 4.8 J ug/L of 2-butanone in the equipment blank. The surrogates for both the samples and the laboratory's QC samples were all within the acceptance limits. The primary laboratory reported that the MS/MSD's performed on sample MW-SHL-19-99-0 were within the acceptance limits for all 84 target analytes for precision and eleven out of 168 target analytes

recoveries were outside the acceptance limits for accuracy. All of the target analytes in the LCS's were recovered within the acceptance limits, except in three out of 84 of the cases, one out of the 84 cases and five out of the 84 cases, for the three respective LCS's analyzed. All of the LCS outages were recovered above the acceptance limits and none of these target analytes were reported in any of the samples. All of the samples were analyzed within the required holding times.

The primary laboratory was also requested by the USACE project chemist, Marie Wojtas, to report the number of tentatively identified compounds (TIC's) found in each sample and report the findings in the case narrative. The primary laboratory reported that TIC's were detected in the following samples: MW-SHM-99-31C, MW-SHM-32X, MW-SHL-22C, MW-SHM-93-22C, MW-SHL-22B, MW-SHM-96-5B, MW-DUP, MW-EB, MW-SHM-96-5C, MW-SHM-93-10C, MW-SHL-11 and MW-SHL-20. The sample MW-SHM-96-5B was also the QA sample. The number of TIC's that were in each sample and their possible identification were not discussed in the case narrative.

3. Data comparison for TAL metals by Method 6010 and mercury by Method 7470.

There were 18 metals determinations. In 11 of these determinations, target analytes were detected by one or both laboratories. There was overall agreement in 15 (83.3%) of the cases and quantitative agreement in eight out of 11 (72.7%) of the cases. No major and three minor data discrepancies were noted.

The first minor data discrepancy occurred in sample MW-SHM-96-5B-QA-99-0 in which the QA laboratory reported chromium at 1.6 B ug/L and the primary laboratory reported 4.7 B ug/L. The second minor discrepancy occurred in sample MW-SHM-96-5B-QA-99-01 in which the QA laboratory reported thallium at 3.7 B ug/L and the primary laboratory reported < 0.90 ug/L.

The primary laboratory's QC data report contained all of the necessary QC information and a complete evaluation was performed. The method blanks were free of contamination above the reporting limit for all of the target analytes. The primary laboratory reported that the LCS recoveries were within the acceptance limits for all of the target analytes. The primary laboratory performed a matrix spike and a matrix duplicate on sample SHL-19-99-01. The matrix spike recoveries were all within the acceptance limits of 75-125%, except for selenium at 151%. The RPD's of the matrix duplicate were less than 20%, except for chromium, copper and thallium. All of the spike levels, percent recoveries and QC limits were appropriately indicated on all of the QC reports. All of the samples were analyzed within the required holding times.

The QA laboratory's QC data were within the acceptance limits for all the target analytes and a complete evaluation was performed. The method blanks were free of contamination above the reporting limits. The QA laboratory reported that the LCS/LCSD's were within the acceptance limits for both accuracy and precision. All of the spike levels, percent recoveries and QC limits were appropriately indicated on all of the QC reports. The QA laboratory reported all of the metals were analyzed by Method 6010 Trace-ICP, except for mercury, which was analyzed by Method 7470-Hg Cold Vapor. All of the samples were analyzed within the required holding times.

4. Data comparison for total cyanide by Method 9010B.

There was one cyanide determination. There was 100% overall agreement in that cyanide was not detected by either laboratory. No major or minor data discrepancies were noted.

The primary laboratory's QC data were within the acceptance limits for cyanide and a complete evaluation was performed. The method blank was free of contamination above the laboratory's reporting limit. The LCS's recovery was not reported. The matrix spike was recovered within the acceptance limits at 99.0%. The matrix duplicate and the original sample were reported below the laboratory's reporting limit. The sample was analyzed within the required holding time.

All of the QA laboratory's QC data were within acceptance limits and a complete evaluation was performed. The method blank was free of contamination above the laboratory's reporting limit. The LCS/LCSD's were within the acceptance limits for both accuracy and precision. The QA laboratory analyzed the sample by modified Method 9012A, instead of Method 9010B as indicated on the chain of custody. The sample was analyzed within the required holding time.

5. The data comparison for anions by Method 300.0.

There were four anion determinations. In two of these determinations, target analytes were detected by one or both laboratories. There was overall agreement in four (100%) of the cases and quantitative agreement in two out of two (100%) of the cases. No major or minor data discrepancies were noted.

The QA laboratory's QC data were all within the acceptance limits and a complete evaluation was performed. The method blanks were free of contamination above the reporting limit for all of the target analytes. The LCS/LCSD were within the acceptance limits for all of the target analytes for both accuracy and precision and the spiking levels were also indicated. The QA laboratory was not requested to perform a MS/MSD on any of the samples and no evaluation of accuracy or precision based on matrix effects could be made. All of the samples were analyzed within the required holding times.

The primary laboratory's QC data were all within the acceptance limits and a complete evaluation was performed. The method blanks were free of contamination above the reporting limit for all of the target analytes. The LCS recoveries were within the acceptance limits. The primary laboratory reported that the matrix spike and the matrix duplicate were within the laboartory's acceptance limits, except for ortho phosphate which was recovered at 40% in the MS. All of the samples were analyzed within the required holding times.

6. Data comparison for COD by Method 410.4 and BOD by Method 405.1.

There was one COD and one BOD determination. In both the COD and BOD determinations, there was 100% overall and quantitative agreement. There were no major or minor data discrepancies noted.

The primary laboratory's QC samples were within the acceptance limits for all of the target analytes and a complete evaluation was performed. The method blank was free of contamination for both the COD and BOD results above the laboratory's reporting limit. The LCS recoveries for COD and BOD were both within the laboratory's acceptance limits. The primary laboratory did not report any MS/MSD's results. The samples were analyzed within the required holding times.

The QA laboratory's QC samples were within the acceptance limits for all of the target analytes and a complete evaluation was performed. The method blank was free of contamination above the reporting limit. The LCS/LCSD's were within the acceptance limits for both accuracy and precision. The QA sample was analyzed within the required holding times of 48 hours. The QA laboratory's contracted lab (CLS Labs) performed the BOD analysis.

7. The data comparison for alkalinity by Method 310.1.

There was one alkalinity determination. In this determination, there was 100% overall and 100% quantitative agreement. No major or minor discrepancies were noted.

The QA laboratory's QC samples were within the acceptance limit for alkalinity and a complete evaluation was performed. The method blank was free of contamination above the reporting limit. The QA laboratory reported that the LCS/LCSD's were within the acceptance limits for both accuracy and precision. There were no MS/MSD's performed for alkalinity and no evaluation of matrix effects could be determined. All of the samples were analyzed within the required holding times.

The primary laboratory's QC samples were all within the acceptance limit for alkalinity and a complete evaluation was performed. The method blank was free of contamination above the reporting limit. The primary laboratory reported that the LCS's were within the acceptance limits. The primary laboratory did not report a matrix duplicate result. All of the samples were analyzed within the required holding times.

8. Data comparison for total hardness by Method 130.2.

There was one hardness determination. In this determination, there was 100% overall and 100% quantitative agreement. No major or minor discrepancies were noted.

The QA laboratory's QC samples were within the acceptance limit for hardness and a complete evaluation was performed. The method blank was free of contamination above the laboratory's reporting limit. The QA laboratory reported that the LCS/LCSD's were within the laboratory's acceptance limits for both accuracy and precision. All of the samples were analyzed within the required holding times.

The primary laboratory's QC samples were within the acceptance limit for total hardness and a complete evaluation was performed. The method blank was free of contamination above the reporting limit. The primary laboratory reported that the LCS was within the laboratory's acceptance limits. The primary laboratory did not perform a MS/MSD or matrix duplicate sample. All of the samples were analyzed within the required holding times.

9. Data comparison for TDS by Method 160.1 and TSS by Method 160.2.

There was one TDS and one TSS determination. In the TDS determination, there was 100% overall and quantitative agreement. No major or minor data discrepancies were reported. In the TSS determination, there was 0% overall and quantitative agreement. One major data discrepancy was noted.

The major discrepancy was reported in sample MW-SHM-96-5B-QA-99-02 in which the QA laboratory reported TSS at 5.0 mg/L and the primary laboratory reported 44.6 mg/L.

The primary laboratory's QC samples were within the acceptance limits for all of the target analytes and a complete evaluation was performed. The method blanks for TDS and TSS were free of contamination above the laboratory's reporting limits. The LCS recoveries for TDS and TSS were both within the laboratory's acceptance limits. The primary laboratory did not report any MS/MSD sample results. The samples were analyzed within the required holding times.

The QA laboratory's QC data were within the acceptance limits for all of the target analytes and a complete evaluation was performed. The method blanks for TDS and TSS were free of contamination above the laboratory's reporting limits. The LCS/LCSD's were within the acceptance limits for both accuracy and precision. All of the samples were analyzed within the required holding times.

10. References.

a. Data Report for Shepley's Hill Landfill Long Term Monitoring, Devens, Massachusetts, prepared by Severn Trent Laboratories, dated 1 December 1999.

b. EM 200-1-6, Chemical Quality Assurance for Hazardous, Toxic and Radioactive Waste (HTRW) Projects, dated 10 October 1997.

APPENDIX A KEY TO COMMENTS ON DATA COMPARISON TABLES

0 - Data agrees if any one of the following apply:

- both values are less than respective detection limit (N<MDL)

- N1 < MDL1 and N2 > MDL2 but < MDL1*

- both values are above respective detection limit (N>MDL) and difference between two values satisfies conditions below

For all analyses in a water matrix and for metals analysis in soil: <2X difference

For all other soil analyses: <4X difference

1 - Minor contamination by laboratory contaminant

2 - Not tested by both laboratories

3 - Minor data discrepancy, disagreement not serious, if any one of the following apply:

- N_1 <MDL₁ and N_2 >MDL₂ and the difference between values N_2 * does not exceed the upper limit (described below) defining a minor data discrepancy

- both values are above respective detection limit (N>MDL*) and conditions described below apply to the difference between the two values

For all analyses in a water matrix and for metals analysis in soil: 2X<difference<3X

For **all** other **soil** analyses: 4X<difference<5X

4 - Major data discrepancy, disagreement serious, if any one of the following apply:

- N_1 <MDL₁ and N_2 >MDL₂ and the difference between values N_2 and MDL₁* exceeds the limit (described below) defining a major data discrepancy

- both values are above respective detection limit (N>MDL*) and conditions described below apply to the difference between the two values

For all analyses in a water matrix and for metals analysis in soil: >3X difference For all other soil analyses: >5X difference MDL = Method Detection Limit
N = Analytical result
* - not all < values are MDLs. Values which are not MDLs will be noted.

Key to data qualifiers:

B - detected in method blank
DO - Diluted out
J - estimated value, above MDL but below practical quantitation limit
NA - Not analyzed
ND - Not detected
NR - Not reported

APPENDIX B

DATA COMPARISON TABLES

QA SAMPLE No.: QA FIELD ID: QA ANALYSIS DATE: QA LABORATORY: EXTRACTION METHOD: ANALYSIS METHOD: G9K030197-001 MW-SHM-96-5B-QA-99-02 11/15/99 QUANTERRA 5030B 8260B CONTRACTORS SAMPLE No.: CONTRACTORS FIELD ID: CONTRACTOR'S ANALYSIS DATE: CONTRACTOR'S LABORATORY: EXTRACTION METHOD: ANALYSIS METHOD: Page 1 of 2

402025 MW-SHM-96-5B-99-02 11/4/99 STL 5030B 8260B

MATERIAL DESCRIPTION: WATER DATE SAMPLED: 11/2/99 UNITS: ug/L

PARAMETER	QA LAB LRL	RESULTS QA LAB	CONTRACTOR LRL	RESULTS CONTRACTOR	COMPARISON CODE
Dichlorodifluoromethane	< 1.0		< 5.0		0
Chloromethane	< 1.0		< 5.0		0
Vinyl Chloride		0.62 J	< 5.0		0
Bromomethane	< 1.0		< 5.0		0
Chloroethane		3.0		2.7 J	0
Trichlorofluoromethane	< 1.0		< 5.0		0
Acrolein	NR		< 5.0		2
Freon TF	NR		< 5.0		2
1.1-Dichloroethene	< 1.0		< 5.0		0
Acetone	< 2.0		< 5.0		0
Methyl Iodide	NR		< 5.0		2
Carbon Disulfide	NR		< 5.0		2
Allyl Chloride	NR		< 5.0		2
Methylene Chloride	< 1.0		< 5.0		0
Acrylonitrile	NR		< 5.0		2
trans-1.2-Dichloroethene	< 1.0		< 5.0		0
1.2-Dichloroethene (total)	NR			3.0 J	2
Methyl-t-Butyl Ether	NR			1.5 J	2
1.1-Dichloroethane		2.4		2.6 J	0
Vinvl Acetate	NR		< 5.0		2
Chloroprene	NR		< 5.0		2
cis-1.2-Dichloroethene	102	2.8		2.9 J	0
7-Butanone	< 2.0	2.0	< 5.0		0
Projonitrile	NR		< 20		2
Methacrylopitrile	NR		< 5.0		2
Bromochloromethane	< 1.0		< 5.0		0
Tetrahydrofuran	NR		< 50		2
Chloroform	< 1.0		< 5.0		0
1.1.1-Trichloroethane	< 1.0		< 5.0		0
Carbon Tetrachloride	< 1.0		< 5.0		0
Isobutyl Alcohol	NR		< 250		2
Benzene		0.86 J		0.94 J	0
1.2-Dichloroethane	< 1.0		< 5.0		0
Trichloroethene	< 1.0		< 5.0		0
1.2-Dichloropropane	< 1.0		< 5.0		0
Methyl Methacrylate	NR		< 5.0		2
Dibromomethane	< 1.0		< 5.0		0
1.4-Dioxane	NR		< 250		2
Bromodichloromethane	< 1.0		< 5.0		0
2-Chloroethyl Vinyl Ether	NR		< 5.0		2
cis-1 3-Dichloropropene	<10		< 5.0		0

SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED

Page 2 of 2

OA SAMPLE No .	G9K030197-001	CONTRACTORS SAMPLE No -	402025
OA FIFL D ID:	MW-SHM-96-5B-OA-99-02	CONTRACTORS FIELD ID:	MW_SHM_96_5B_99_02
OA ANALYSIS DATE:	11/15/99	CONTRACTOR'S ANALYSIS DATE:	5/20/99
QA LABORATORY:	QUANTERRA	CONTRACTOR'S LABORATORY:	STL
EXTRACTION METHOD:	5030B	EXTRACTION METHOD:	5030B
ANALYSIS METHOD:	8260B	ANALYSIS METHOD:	8260B

MATERIAL DESCRIPTION: WATER DATE SAMPLED: 11/2/99 UNITS: ug/L

PARAMETER	QA LAB LRL	QA LAB	CONTRACTOR LRL	CONTRACTOR	COMPARISC
4-Methyl-2-pentanone	< 2.0		< 5.0		0
Toluene	< 1.0		< 5.0		0
trans-1,3-Dichloropropene	< 1.0		< 5.0		0
Ethyl Methacrylate	NR		< 5.0		2
1,1,2-Trichloroethane	< 1.0		< 5.0		0
Tetrachloroethene	< 1.0		< 5.0		0
2-Hexanone	NR		< 5.0		2
Dibromochloromethane	< 1.0		< 5.0		0
1,2-Dibromoethane	< 2.0		< 5.0		0
Chlorobenzene		0.36 J	< 5.0		0
1,1,1,2-Tetrachloroethane	< 1.0		< 5.0		0
Ethylbenzene	< 1.0		< 5.0		0
Xylene (total)	< 1.0		< 5.0		0
Styrene	< 1.0		< 5.0		0
Bromoform	< 1.0		< 5.0		0
Isopropylbenzene	NR		< 5.0		2
cis-1,4-Dichloro-2-butene	NR		< 5.0		2
1,1,2,2-Tetrachloroethane	NR		< 5.0		2
1,2,3-Trichloropropane	NR		< 5.0		2
trans-1,4-Dichloro-2-butene	NR		< 5.0		2
1,3-Dichlorobenzene	NR		< 5.0		2
1.4-Dichlorobenzene		1.3	< 5.0		0
1,2-Dichlorobenzene		0.16 J	< 5.0		0
1,2-Dibromo-3-Chloropropane	< 2.0		< 5.0		0
1,2,4-Trichlorobenzene	< 1.0		< 5.0		0
Hexachlorobutadiene	< 1.0		< 5.0		0
Naphthalene	< 1.0		< 5.0		0
2,2-Dichloropropane	< 1.0		< 5.0		0
1.1-Dichloropropene	< 1.0		< 5.0		0
1.3-Dichloropropane	< 1.0		< 5.0		0
Bromobenzene	NR		< 5.0		2
n-Propylbenzene	NR		< 5.0		2
2-Chlorotoluene	NR		< 5.0		2
4-Chlorotoluene	NR		< 5.0		2
1,3,5-Trimethylbenzene	NR		< 5.0		2
tert-Butylbenzene	NR		< 5.0		2
1,2,4-Trimethylbenzene	NR		< 5.0		2
sec-Butylbenzene	NR		< 5.0		2
4-Isopropyltoluene	NR		< 5.0		2
n-Butylbenzene	NR		< 5.0		2
1,2,3-Trichlorobenzene	< 1.0	_	< 5.0		0
SURROGATE RECOVERIES	(%) QA				PRIMARY
4-Bromofluorobenzene (70-130) 10		Toluene-d8 (88	3-110)	98
1,2-Dichloroethaue-d4 (70-130)	10)	1,2-Dichloroet	hane-d4 (72-141)	106
Toulene-d8 (70-130)	10	5	Bromofluorobe	mzene (72-122)	100

SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED * = Surrogates outside of acceptable limits

QA SAMPLE No.: QA FIELD ID: QA ANALYSIS DATE: QA LABORATORY: EXTRACTION METHOD: ANALYSIS METHOD: G9K030197-001 MW-SHM-96-5B-QA-99-02 11-(10+11)-99 QUANTERRA 3010A 6010B,Hg-7470A CONTRACTORS SAMPLE No.: CONTRACTORS FIELD ID: CONTRACTOR'S ANALYSIS DATE: CONTRACTOR'S LABORATORY: EXTRACTION METHOD: ANALYSIS METHOD: 402025 MW-SHM-96-5B-99-02 11/16/99 STL 3010A 6010, Hg-7470

MATERIAL DESCRIPTION: WATER DATE SAMPLED: 11/2/99 UNITS: ug/L

PARAMETER	QA LAB LRL	RESULTS QA LAB	CONTRACTOR LRL	RESULTS CONTRACTOR	COMPARISON CODE
Aluminum	NR		< 14.3		2
Antimony	< 10		< 2.7		0
Arsenic		2800		2700	0
Barium		51		51.6	0
Bervllium	< 5.0			4.8 B	0
Cadmium	< 5.0		< 0.30		0
Calciuum	NR			118000	2
Chromium		1.6 B		4.7 B	3
Colbolt		15 B		14.4 B	0
Copper	< 25			1.8 B	0
Iron		26100		26900	0
Lead	< 5.0		< 1.0		0
Manganese		13400		17000	0
Mercury	< 0.20 (11-1	.5-99)	< 0.10 (11-	6-99)	0
Molybdenum		2.7 B		NR	2
Nickel		17 B		13.5 B	0
Potassium	NR			9680	2
Selenium	< 5.0		< 2.4		0
Silver	< 5.0		< 1.9		0
Thallium		3.7 B		8.3 B	3
Vanadium	< 50		< 1.5		0
Zinc		3.7 B		7.8 B	3

SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED

QA SAMPLE No.: QA FIELD ID: QA ANALYSIS DATE: QA LABORATORY: EXTRACTION METHOD: ANALYSIS METHOD:	QA SAMPLE No.:G9K030197-001CONTRACTORS SAMPLE No.:QA FIELD ID:MW-SHM-96-5B-QA-99-02CONTRACTORS FIELD ID:A ANALYSIS DATE:11/(10+11)/1999CONTRACTOR'S ANALYSIS DATE:QA LABORATORY:QUANTERRACONTRACTOR'S LABORATORY:QA LABORATORY:QUANTERRACONTRACTOR'S LABORATORY:ACTION METHOD:NAEXTRACTION METHOD:NALYSIS METHOD:9012AANALYSIS METHOD:MATERIAL DESCRIPTION:WATER DATE SAMPLED:11/2/99 UNITS:UNITS:ug/LRESULTS LRLRESULTS LRLCyanide (CN)<10.0<10.0	SAMPLE No.: DRS FIELD ID: ALYSIS DATE: ABORATORY: ON METHOD: SIS METHOD:	402025 MW-SHM-96-5B-99-02 11/19/99 STL, VT NA 9010		
-					
PARAMETER	QA LAB LRL	RESULTS QA LAB	CONTRACTOR LRL	RESULTS CONTRACTOR	COMPARISON CODE
Cyanide (CN)	< 10.0		< 10.0		0

SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED

1.

QA SAMPLE No .: QA FIELD ID: QA ANALYSIS DATE: QA LABORATORY: **EXTRACTION METHOD:** ANALYSIS METHOD:

G9K030197-001 CONTRACTORS SAMPLE No .: CONTRACTORS FIELD ID: MW-SHM-96-5B-QA-99-02 CONTRACTOR'S ANALYSIS DATE: QUANTERRA CONTRACTOR'S LABORATORY: EXTRACTION METHOD: ANALYSIS METHOD:

402025 MW-SHM-96-5B-99-02 NR STL, VT NA 300.0

MATERIAL DESCRIPTION: WATER DATE SAMPLED: 11/2/99 UNITS: mg/L

11/3/99

NA

300.0

PARAMETER	QA LAB LRL	RESULTS QA LAB	CONTRACTOR LRL	RESULTS CONTRACTOR	COMPARISON CODE
Chloride, CL	5	54.4 Q		55.5	0
Nitrate, as N	< 0.050		< 0.2		0
Othophosphate, as P	< 0.20		< 0.2		0
Culture COA		12		16	0

SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED Q=Elevated reporting limit due to high analyte level.

QA SAMPLE No.: QA FIELD ID: QA ANALYSIS DATE: QA LABORATORY: EXTRACTION METHOD: ANALYSIS METHOD:	G9K030197-001 MW-SHM-96-51 11/10/99 QUANTERRA NA 410.4-COD	3-QA-99-02	CONTRACTORS CONTRACTOR'S ANA CONTRACTOR'S L CONTRACTOR'S L EXTRACTI ANALY	S SAMPLE No.: DRS FIELD ID: ALYSIS DATE: ABORATORY: ION METHOD: SIS METHOD:	402025 MW-SHM-96-5B-99-02 NR STL, VT NA 410.1-COD	
	MATERIAL E DA'	DESCRIPTION: V TE SAMPLED: 1 UNITS:	VATER (177-27) mg/%			
PARAMETER	QA LAB LRL	RESULTS QA LAB	CONTRACTOR LRL	RESULTS CONTRACTOR	COMPARISON CODE	
Chemical Oxygen Demand (COD)		21.5		20	0	

SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED

QA SAMPLE No .: G9K030197-001 CONTRACTORS SAMPLE No .: 402025 QA FIELD ID: MW-SHM-96-5B-QA-99-02 CONTRACTORS FIELD ID: MW-SHM-96-5B-99-02 QA ANALYSIS DATE: 11/9/99 CONTRACTOR'S ANALYSIS DATE: NR CLS LABS QA LABORATORY: CONTRACTOR'S LABORATORY: STL, VT **EXTRACTION METHOD:** NA EXTRACTION METHOD: NA ANALYSIS METHOD: 405.1 ANALYSIS METHOD: 405.1

> MATERIAL DESCRIPTION: WATER DATE SAMPLED: 11/2/99 UNITS: mg/L

PARAMETER	QA LAB	RESULTS	CONTRACTOR	RESULTS	COMPARISON
	LRL	QA LAB	LRL	CONTRACTOR	CODE
Biological Oxygen Demand (5 Day)	< 3.0		< 2.0		0

SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED

QA SAMPLE No.:	G9K030197-001	-QA-99-02	CONTRACTORS	SAMPLE No.:	402025
QA FIELD ID:	MW-SHM-96-5B		CONTRACTO	DRS FIELD ID:	MW-SHM-96-5B-99-02
QA ANALYSIS DATE:	11/8/99		CONTRACTOR'S ANA	ALYSIS DATE:	NR
QA LABORATORY:	QUANTERRA		CONTRACTOR'S L.	ABORATORY:	STL, VT
EXTRACTION METHOD:	NA		EXTRACTI	ON METHOD:	NA
ANALYSIS METHOD:	310.1		ANALY	SIS METHOD:	310.1
	MATERIAL D DAT	ESCRIPTION: W 'E SAMPLED: 1 UNITS:	/ATER 1/2/99 mg/L	*	
PARAMETER	QA LAB	RESULTS	CONTRACTOR	RESULTS	COMPARISON
	LRL	QA LAB	LRL	CONTRACTOR	CODE
Total Alkalinity as CaCO3		395		336	0

SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED

1

QA SAMPLE No.: QA FIELD ID: QA ANALYSIS DATE: QA LABORATORY: EXTRACTION METHOD:	G9K030197-00 MW-SHM-96-5 11/17/99 QUANTERRA NA	1 B-QA-99-02	CONTRACTORS CONTRACTOR CONTRACTOR'S AN CONTRACTOR'S L EXTRACT	S SAMPLE No.: ORS FIELD ID: ALYSIS DATE: ABORATORY: ION METHOD:	402025 MW-SHM-96-5B-99-02 NR STL, VT NA
ANALYSIS METHOD:	130.2 MATERIAL I DA	DESCRIPTION: Y TE SAMPLED: LINITS:	ANALY WATER 11/2/99 mg/l	SIS METHOD:	130.2
PARAMETER	QA LAB LRL	RESULTS QA LAB	CONTRACTOR	RESULTS CONTRACTOR	COMPARISON CODE
Total Hardness as CaCO3	, T. 67	360 Q		355	0

SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED

QA SAMPLE No.: QA FIELD ID: QA ANALYSIS DATE: QA LABORATORY: EXTRACTION METHOD: ANALYSIS METHOD:	G9K030197-00 MW-SHM-96- 11/9/99 QUANTERRA NA 160.1 and 160.)1 5B-QA-99-02 2	CONTRACTORS CONTRACTO CONTRACTOR'S ANA CONTRACTOR'S LA EXTRACTI ANALY	402025 MW-SHM-96-5B-99-02 NR STL, VT NA 160.1 and 160.2	
	MATERIAL I DA	DESCRIPTION: Y TE SAMPLED: UNITS:	WATER 11/2/99 mg/L		
PARAMETER	QA LAB	RESULTS	CONTRACTOR	RESULTS	COMPARISON
	LRL	QA LAB	LRL	CONTRACTOR	CODE
Total Dissolved Solids (TDS by 16	0.1)	502	- 8	542	0
Total Suspended Solids (TSS by 16	50.2)	5.0		44.6	4

SEE APPENDIX A FOR KEY TO COMMENTS NR=NOT REPORTED

APPENDIX C

SAMPLE RECEIPT & CUSTODY DOCUMENTATION

Chain of **Custody Record**



QUA-4124			1					12	_		_	_						
USArmy Cosps of Engi	ineers		Project Manager	MARIC Wojtas 11-3									4262					
696 Virginia Rd.			G78-	ber (Area Code) 318 - 81	175 A	Ax	978-318-8663							θ	1	of	1_	
City State	Zip Code UN74	2	Sile Contact Steve S	imme	r				1		q	01-	12	Ana	lysis	11	TT	
Shepley's HILL LTV	n		Carrier/Waybill N FEDEX	lumber 814	8349	204	,972		000	010	901	ISOL'O	208 1	105.1	00.0			
Contract/Purchase Order/Quote No.		1		1 2 2 1	L Questo				0.0	0-2-0	10	oc-sug	HAR.	2. 1	2.11			
Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Type	No.	Preservative	Condition on Receipt		Lin	1 C		0	8	F			
MW-SAM-96-5B-QA-99-02 Trip Blunk	11-2-99	1235	Wate R. Wank	5370mL 80 mL	guess	6/3	See buttles HCL	good	32	1	1	+	1	1				
								00 11-3-59	F	-	-	+	-					
/		-											-					
									-		-	-	-					
- white is a											-		-					
										-								
Special instructions																		
Possible Hazard Identification Image: Non-Hazard Flammable Skin Ture Assund Time Bogulard Skin	Irritant	Poison	B Un	known	Sample I	Disposa eturn Ti Specific	al o Client	Disposal By Lab			Arch	ive Fi	or		M	onths		
Normal Rush				<i>II.</i>	Fighting	растс	(Spacity)											
1. Relinquished By Katherine Miller			Date 11-2-99	Time 1315	- 1. Recei	Wed By	1/	B. Jennings						ate 1/1	13/9	9	050	
2. Refinduished By			Date	Time	2. Recei	d By	/	J						ald	1	Tin	10	
3. Relinquished By			Date	Time	3. Receiv	ved Ek	1		-		-		D	ate		Tin	10	

Comments * VOC: > reserved WHCL /mrLS-HNO3/Cyan: (LefNor) / CO DISTRIBUTION: . : Stays with Sample; CANARY - Returned to Client with Report FINK Field Copy

+2804

Chain of	
onum of	
Custody Record	

R5606



0.00 1

3

Client Quanterva		Project Ma Telephone	nager D Numl	Le (L M Area C	a Code)/	Fax N	B	VC	00	C	S			Date Lab	 Numbe	3-0	17	Chain	of Custody N	^{umbę} 2809:
City LUSAC CA Zip Co	vlay_	Site Conta	ct			L	ab Cc	ontact				F	-	Ai	nalysis re spa	(Attac ce is r	h list if needed,		Page		_ of
Project Name USACOE		Carrier/Wa	ybill N	Vumb	ner	-		-												Special I Condition	nstructions/
Contractive dichase Cited Actives No.				Ma	trix			Cor Pre	serva	ers ative	s	- 3							11	Condition	a or necerpt
Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Aqueous	Sed.	Sall		Unpres. H2SO4	SONH	HCI	NBOH	ZnAc/ NaOH	A									
69K030197-1	11-2-99	1235	+	-)	4	-	1.1			X	-	-							
							1														
		-		-	-	+	1	-	-		-	-		+	-	+					
														-							
							1	1	t							-					
			1	10.0			-														
								1													
																			10.7		
Possible Hazard Identification Image: Non-Hazard Image: Flammable Skin Irritant Image: Skin Irritant Turn Around Time Required Image: Skin Irritant Image:	Poison B	Unknown	Samp	ole D Return	isposa 1 To C	d llent		Disp C Re	oosal quire	By La ment	ab s (Spe	Arct	nive Fi	or	M	lonths	(A lee longer	may be a than 3 m	assessed il nonths)	'samples are	retained
24 Hours 48 Hours 7 Days 14 Days 1. Relinquished By	s 🗌 21 Days	D Other		17	ime		- 1	. Rec	eived	Ву		0				~		-	Dat	°	Time
2. Relinquished By Ath Ath		Date	19	$\frac{1}{1^n}$	<u>14</u>	01	2 2	Rec	eived	By		004	n	-			-		Dat	13/199	Time
3. Relinquished By		Date		17	ima	-	3	. Rec	eivea	By	-		-						Dat	8	Time
Comments			-	-		-	1	-													1
Quanterra

CLIENT US Army	CofE			PM	LOG # 3- 2	-71
LOT# (QUANTIMS ID)	9 K0301	97 00	OTE # 9	0186	LOCATION(S)	20H VF
			Rus		Initials	Date
DATE RECEIVED 11 03 94		RECEIVED		6970	But	10/03/29
					ł	
			т.		1	Ť
		BAY GLOBAL				
	OURIER	OTHER				
CUSTODY SEAL STATUS	INTACT	BROKEN		-		
CUSTODY SEAL #(S)						
SHIPPPING CONTAINER(S)	QUANTERRA (CLIENT	N/A			
TEMPERTURE RECORD (IN °C)		106	70			
LUC #(5)		4.10	10		and the second damage	a second second
TEMPERATURE DI ANIZ			-			
TEMPERATURE BLANK	0	1°0				
TEMPERATURE BLANK AMBIENT TEMPERATURE	O			FINA	-	
TEMPERATURE BLANK AMBIENT TEMPERATURE pH MEASURED	() YES		JMALY	E NIA		
TEMPERATURE BLANK AMBIENT TEMPERATURE pH MEASURED LABELED BY	0 YES		DMALY	E NIA	- J Maj	
TEMPERATURE BLANK AMBIENT TEMPERATURE pH MEASURED LABELED BY LABELS CHECKED BY	0 YES		DMALY	ENIA		
TEMPERATURE BLANK AMBIENT TEMPERATURE pH MEASURED LABELED BY LABELS CHECKED BY SHORT HOLD TEST NOTIFICATION	O □ YES		DMALY	RECEIVING		
TEMPERATURE BLANK AMBIENT TEMPERATURE pH MEASURED LABELED BY LABELS CHECKED BY SHORT HOLD TEST NOTIFICATION	O □ YES		DMALY SAMPLET WETCHE	RECEIVING	> AK	
TEMPERATURE BLANK AMBIENT TEMPERATURE pH MEASURED LABELED BY LABELS CHECKED BY SHORT HOLD TEST NOTIFICATION	VES YES		DMALY SAMPLE WETCHE		> AK	
TEMPERATURE BLANK AMBIENT TEMPERATURE pH MEASURED LABELED BY LABELS CHECKED BY SHORT HOLD TEST NOTIFICATION	VES YES		DMALY SAMPLE WETCHE	RECEIVING M NIA XI-ANA		
TEMPERATURE BLANK AMBIENT TEMPERATURE pH MEASURED LABELED BY LABELS CHECKED BY SHORT HOLD TEST NOTIFICATION METALS NOTIFIED OF FILTER/ COMPLETE SHIPMENT RECEIV APPROPRIATE TEMPERATURES		RBAL & EMAIL	DMALY SAMPLET WETCHE	RECEIVING M NIA XI-ANA XI-ANA		
TEMPERATURE BLANK AMBIENT TEMPERATURE pH MEASURED LABELED BY LABELS CHECKED BY SHORT HOLD TEST NOTIFICATION METALS NOTIFIED OF FILTER/ COMPLETE SHIPMENT RECEIV APPROPRIATE TEMPERATURES		RBAL & EMAIL	DMALY SAMPLET WETCHE			
TEMPERATURE BLANK AMBIENT TEMPERATURE pH MEASURED LABELED BY LABELS CHECKED BY SHORT HOLD TEST NOTIFICATION COMPLETE SHIPMENT RECEIV APPROPRIATE TEMPERATURES Clouseau Complete Complement	PRESERVE VIA VER	RBAL & EMAIL DITION WITH RESERVATIVES XCEEDED (2 °-6 °	DMALY SAMPLET WETCHE	RECEIVING M E NIA XI-ALIA XI-ALIA I NIA	> AK	

?

LEAVE NO SPACES BLANK. USE "N/A" IF NOT APPLICABLE. INITIAL AND DATE ALL "N/A" ENTRIES.

÷ 1

SHL-8 + + + . + de ast WELL SH -13 220 E + SHL-21 + GAS VENT GAS VENT + CONTOUR ITTE 1.00 to (+28/8/00 + GAS VENT GAS VENT PIEZOMETER N-2 + WELL 280 +PIEZOMETER + + 22 GROUP 2 . GAS VENT CROUP -14 PIEZOM GAS HENT + + GAS VENT GAS VENT PIEZOMETER GAS VENT + + + + GAS VENT GAS VENT + + + + + + + + + + + Cast sam & + GAS VENT 15 + + + + + + + + + + + 1+ + + + + 神子 + 23 GAS VENT GAS VENT + + + + + Sitt GAS VENT 230 08.43 + -± + 248 PIEZOMETER N47 P + F230+) + + 248 + 238 WELL SHE-17 + + + + WELL SHL-12 WELL SHL-+ + WELL SHL-25 + + + + + 4 + + 1+ +

-		-				,	
+	+	+	+	+	+	+	+ +
+	+	+	+	+	+	+	+ +
+	+	+	+	+	+	+	+ +
+	+	+	+	+	+	+	+ + N
+	+	+	+	+	+	+	+ +
+	+	+	+	+	+	+	+ +
`+	+	+	+	+	+	+	+ +
+	+	+	+	+	+	+	· + +
+	+	+	+	+	+	.+	+ +
+	+	+	+	+	+	+	+ +
+	+	+	+	+ //	111	t	230-1
+	+	+	+	+		+	+ +
+	+	+	+	H	30.4	+	+ +
+	+	.+	+	14	it l	+	+ +
THE	and the second	+	J.	14	1	240	\$\$+ +
TT:	+	+	1+ 1	/ +	240	も	1. THE LOCATIONS OF SHM-96-58, SHM-96-5C
E	man and	+	+//	+	Hr	264	AND SHM-96-228 ARE APPROXIMATED.
	+	+	+	+	H	T	A BER
7+	+	+		+	胀	+)++ +
WELC	SHE-7	+	14	+/	+ 6	F	
11+	+	+	1i+	+	+ 1	2504	
+	+	+	+	+	+	+	HORIZONTAL DATUM MASSACHUSETTS PLANE COORDINATE SYSTEM
+	+	+	+	+	+	+	VERTICAL DATUM: NGVD 1929
+	+	+	+	+	+	+	
+	+	+	+	+	+	+	0 2200 4903
+	+	+	+	+	+	+	1 5000. HORIZONTAL
+	+	+	+	+	+	+	ARMY CORPS OF ENGINEERS
+	+	+	+	+	+	+	FIGURE 4-1
+	+	+	+	+	+	+	SHEPLEY'S HILL LANDFILL
+	+	+	+	+	+	+	GROUNDWATER MONITORING
+	+	+	+	+	+	+	BOSTON, MASSACHUSETTS REVISED BY COE, NAE 3/99

