



MEMORANDUM

18 June 2013
File No. 39899-010

TO: Massachusetts Department of Environmental - Solid Waste Management Section
20 Riverside Drive
Lakeville, MA

Attn: Mark Dakers, Acting Section Chief

C: Wendy Henderson, Dartmouth Board of Health
Boston Environmental Corp.
Golledge Strategies & Solutions LLC

FROM: Haley & Aldrich, Inc.
Marc J. Richards, P.E., LSP, Senior Project Manager | Vice President
Peter Zawadzkas, Senior Scientist

Subject: Summary of Groundwater Assessment Findings
Former Cole Brook Pines/Cecil Smith Landfill
452 Old Fall River Road
Dartmouth, Massachusetts

EXECUTIVE SUMMARY OF GROUNDWATER ASSESSMENT FINDINGS

The attached memorandum outlines the background, environmental history and analytical results from recent groundwater sampling for the Former Cole Brook/Cecil Smith Landfill (“subject site”) located off of Old Fall River Road in Dartmouth, Massachusetts.

Summary

Haley & Aldrich conducted supplemental environmental sampling activities in May 2013 at the subject site, consistent with MassDEP’s approval dated 17 May 2013. Based on the recent groundwater sampling and previous site investigations, the following site conditions are noted:

- No compounds were detected in groundwater above applicable risk-based standards established in the Massachusetts Contingency Plan, which are designed to be protective of human health and the environment.

- Upgradient (well HA-4) and downgradient wells (MW-5, MW-6, MW-7, SGA-04) did not have elevated water quality parameters indicating overburden groundwater quality upgradient and downgradient to the landfill has not been adversely degraded from a drinking water perspective. The only exception is a low detection of manganese in wells MW-5 and MW-7. Manganese is naturally occurring and is often detected in elevated concentrations in groundwater and these detections have not been attributed to the landfill.
- For general water quality parameters that relate to drinking water aesthetics, color, taste and odor, there were detected exceedances in groundwater located directly adjacent to the landfill to certain drinking water secondary and recommended levels, including alkalinity, nitrate, dissolved solids, calcium, sodium, iron and manganese. These results are consistent with and typical for areas adjacent to a construction and demolition debris landfill.

Based on historic data and the supplemental groundwater sampling conducted in May 2013, groundwater has not been adversely impacted to a condition where there is immediate risk to human health or the environment.

Additional details regarding the supplemental groundwater sampling are summarized below.

INTRODUCTION

Haley & Aldrich conducted groundwater assessment activities at the site of Former Cole Brook Pines/Cecil Smith Landfill, in Dartmouth, Massachusetts (herein referred to as the “site”). Environmental sampling activities were conducted in accordance with our proposal dated 9 May 2013 (“Agreement”). The assessment work summarized below was also performed in accordance with Haley & Aldrich’s BWP SW 45 Alternative Review application (Application) and the subsequent Massachusetts Department of Environmental Protection (MassDEP) approval dated 17 May 2013.

BACKGROUND

As part of continuing assessment activities associated with the proposed closure of the landfill by the Boston Environmental Corp., a groundwater assessment program was undertaken by Haley & Aldrich to further evaluate environmental conditions and to assess potential groundwater impacts from historical site uses.

Portions of the property known as the Cole Brook Pines/Cecil Smith Landfill received solid waste for on-site disposal for approximately 20 years (1954 to 1974). The solid waste is generally described as demolition debris (wood, concrete, brick, roofing, metals, plastics, lead-based paint, and automobile waste). The majority of the solid waste contained in the landfill appears consistent with typical landfills of this era. Since the property began solid waste operations, a series of environmental sampling events have occurred over the years to evaluate the solid waste (limits and content), surface water, sediment, soil, and groundwater. The results from these past investigations enabled the EPA in 2004/2005 to perform a comprehensive sampling program to further evaluate conditions at the site.

The attached summary tables include environmental sampling results collected by a variety of entities over a period of the past several decades. The data was summarized from available information included in the US EPA’s 28 January 2005 Final Expanded Site Inspection Report.

For discussion and comparison purposes, soil data is compared to the Massachusetts Contingency Plan (MCP) Method 1 S-1/GW-1 risk-based cleanup standards. Groundwater data was compared to Method 1 GW-1 standards, as nearby groundwater may be protected or used for drinking water. Groundwater data was also compared to Method 1 GW-3 standards as surface water (Cole Brook and associated wetlands) is located in proximity to the former landfill.

Comparisons to MCP standards are for general discussion only as the landfill is adequately regulated under MassDEP’s Solid Waste program.

Soil Data

The attached Table I summarizes available soil data from the landfill property. The majority of the soil sampling was surficial in nature (2 feet and less) from around the property. As shown, one sample collected in 1990 from within the landfill property contained some semi-volatile organic compounds

(SCVOCs) at concentrations above Method 1 S-1 standards. In 2002, a soil sample collected from within the landfill area contained lead above the Method 1 S-1 MCP standard.

The more comprehensive sampling performed by the EPA in 2004 did not reveal any constituent concentrations above MCP standards.

The detection of the SVOC and lead concentrations noted above are expected for samples collected from within the limits of a solid waste landfill. No other hazardous or toxic materials were noted in the soil samples that would indicate an immediate risk to human health or the environment.

Groundwater

The attached Table II summarizes available data from groundwater samples collected and analyzed in the vicinity of the landfill property. Groundwater sampling has occurred at the property since 1977. As shown in Table II, intermittent detections of constituents in groundwater have been reported over the years from select groundwater sample locations. Based on a review of the data and the 2004 EPA comprehensive groundwater sampling program, concentrations of volatile organic compounds (VOCs), SVOCs, polychlorinated biphenyls (PCBs) and total cyanide were not detected at concentrations above MCP risk-based standards. The 2004 EPA data identified four inorganic constituents that exceed applicable MCP standards, which included beryllium, total chromium, lead, and vanadium. Aside from lead, which was detected in two separate wells, the other organics above MCP standards were all detected in separate well locations.

The EPA report does not include a description of the methodology used to collect the groundwater samples. When sampling for inorganics, it is important to analyze samples for dissolved and not total metals. Dissolved samples are field filtered to remove elevated turbidity that may be present in the sample. Elevated turbidity can lead to false positives or inaccurate elevated results. The EPA noted that they only field filtered one sample (SGA-02) due to elevated turbidity. The sample result in Table II was the unfiltered (total) result. The EPA noted in the report text that the sample result for SGA-02 when filtered (dissolved) did not show organic constituents above MCP standards.

It is Haley & Aldrich's professional opinion that if the other groundwater samples were field filtered, the inorganic results would have likely been below applicable MCP standards.

Drinking Water

The attached Table III summarizes available data from samples collected and analyzed from the on-site private drinking water well located at the residence situated on top of the area designated as landfill. Laboratory analysis of water samples from this well by the EPA in 2004 did not detect constituents above MCP drinking water standards.

Surface Water and Sediment

The 2004 EPA report summarizes that previous surface water samples that were collected in 2002; however, the data was not available in the EPA report. In 1977, two surface water samples were

collected; one upstream and one downstream sample location. The report referenced metal results for these two samples, which were very similar for copper and zinc.

The 2004 EPA report summarizes past sediment sampling performed since 1982, including the EPA's 2004 comprehensive sediment sampling program. The results are summarized in Table IV.

When sampling sediment, it is common to compare sampling results to nearby sample locations that have not been impacted by site operations. Nearby sample locations are often referred to as "background" or "reference" locations. Table IV includes the sample locations that were identified as background samples.

The interpretation of the sediment results collected in the years of 1982, 2000, and 2002 is difficult because location information and background reference locations were not available. The data does indicate detectable concentrations of beryllium, cadmium, PCBs, and a series of SVOCs. It should be noted that for the detected SVOCs, cadmium, and PCBs that have sediment screening values established by the MassDEP, the detected concentrations were less than the MassDEP screening values. MassDEP screening values represent concentrations that if exceeded, could signal potential environmental harm. However, as noted, none of the values were exceeded for the compounds that have established screening values.

The EPA's 2004 sediment data includes nine sediment samples collected adjacent to or near the landfill area and eight samples that are identified as "background" samples. The background samples are used for general comparison purposes to help determine if sediment samples collected near the landfill are substantially greater than background, indicating a potential impact by the landfill.

Based on a review of the 2004 EPA data in Table IV, the following is observed:

- PCBs and cyanide were not detected.
- For those samples where various metals and inorganics were detected above some of the background concentrations, the concentrations did not exceed the established MassDEP screening criteria for those metals/inorganics.
- The VOCs that were detected are from samples collected from within the landfill or were background samples. In addition, the VOCs detected are common laboratory contaminants and may not be associated with the landfill.
- Only two SVOCs were detected in one sediment sample, at very low concentrations.
- Pesticides were detected in both background and site samples at similar concentrations.

Based on the above data, although localized impacts to sediment may have occurred from the landfill, the data suggests that these impacts are not contributing to environmental harm.

Summary of Previous Analytical Data

Based on the above data summary, the data does not identify conditions that are not uncommon to solid waste landfills. The data indicates conditions one would reasonably expect from a historic C&D disposal landfill. In addition, no immediate risk to human health or the environment is apparent from the data that has been collected.

SUBSURFACE INVESTIGATION

The groundwater assessment activities summarized below supplement the previous investigations that have been completed. New monitoring well locations were selected based on spatial coverage and to supplement previous analytical data.

A total of six (6) new observation wells (designated as HA-1 (OW) through HA-6 (OW)) were drilled by Geologic Earth Explorations, Inc., of Norfolk, Massachusetts on 22 through 24 May 2013. Corresponding test borings HA-1 through HA-6 were all relatively shallow soil borings with depths ranging from approximately 10 to 16 feet below ground surface (bgs).

The designations and approximate locations of both the existing and new observation wells are shown on Figure 2, Site and Subsurface Exploration Location Plan. Refer to Appendix A for a copy of the observation well installation logs.

FIELD OBSERVATIONS

Geology

Geologic information was obtained from Haley & Aldrich's subsurface investigation of the subject site. This information is supplemented by available subsurface information from several exploration phases conducted at the site. The general subsurface stratigraphy identified at the test boring locations is outlined in the table below:

Strata	Range of Thickness (ft)
Miscellaneous Fill/Debris	0 to 4
Loess	0 to 2
Topsoil	0 to 2
Organic Deposits (peat /debris)	0 to 5.5
Glaciofluvial Deposits	4.5 to 12
Bedrock	Not Encountered

Much of the fill was found between and among large, buried pieces of debris that was not recorded in the logs, due to its size and exogenous nature. Fill materials recorded in the logs include brick, ash, Styrofoam and plastic fragments.

Soil and material brought to the surface during drilling operations was field-screened for the presence of VOCs by exposing a photoionization detector (PID) equipped with a 10.6 electron-volt lamp to vapors accumulated in the headspace of jar samples containing material encountered. Elevated PID readings were not detected in any soil samples that were field screened indicating lack of a field-identifiable VOC impact to the soils.

Hydrology

Haley & Aldrich measured depth to groundwater in each of the newly installed wells and the existing wells sampled. In addition, surface water elevations in proximity to the existing monitoring wells were collected.

A summary of the groundwater depth measurements and surface water elevations are as follows:

Well ID	Elevation of PVC (ft)	Depth to Water (ft) 5/28/2013	Groundwater Elevation (ft) 5/28/2013	Surface Water Elevation 6/13/2013
HA-1	75.20	5.53	69.67	71.0
SGA-03	74.20	6.26	67.94	
HA-2	75.16	4.95	70.21	70.2
HA-3	84.20	10.3	73.90	
HA-4	81.90	13.4	68.50	75.0
HA-5	74.30	5.57	68.73	71.0
HA-6	73.60	6.16	67.44	
MW-5	74.91	16.11	58.80	--
MW-6	87.41	15.15	72.26	--
MW-7	93.34	9.50	83.84	--
SGA-01S	84.20	14.53	69.67	80.0
SGA-01D	82.40	5.24	77.16	--
SGA-04	75.17	3.45	71.72	--

Notes:

1. Elevations are based on a NGVD 1929 Datum.

Surface water elevations were also measured in five locations within the abutting perennial stream that surrounds the landfill. The surface water elevations were collected on 13 June 2013. Depth to groundwater and surface water measurements were unable to be measured the same day, therefore the

results can not be specifically correlated. In addition, due to precipitation events that occurred within proximity to the timing of the surface water survey, the surface water elevation data are likely not representative of average flow conditions.

GROUNDWATER FLOW DIRECTION

Based on a variety of project site features, including the presence of the stream, nearby wetlands, the relative large spacing of the monitoring well network across the entire study area, and the groundwater elevation and surface water data collected, it was not possible to create a groundwater flow direction contour map that presented clear flow patterns. However, the following observations can be made:

- Groundwater elevations around the landfill generally support the observation that groundwater flow occurs radially from the landfill towards the surrounding surface water stream. This is consistent with past EPA conclusions.
- Surface water elevations (largely due to precipitation events) generally indicate higher surface water elevations than nearby groundwater elevations. Although the groundwater and surface water elevation data were not collected the same day, the data initially supports the observation that the majority of the surface water with the stream originates from the large areas of surrounding wetlands and not from the groundwater beneath the landfill.
- Groundwater quality data (as further presented later in the memorandum may suggest that there is a groundwater flow component from the landfill towards the south west.
- Based on regional surface water features and ground elevations, regional groundwater flow from the landfill is expected to flow in a southwesterly direction.

INITIAL EVALUATION OF EFFECT OF LANDFILL ON “PERENNIAL STREAM”

A site reconnaissance was performed on 10 May 2013 to evaluate if the presence of the landfill has affected the structure and function of the unnamed “perennial stream” that meanders around the perimeter of the landfill. It is apparent from the available maps (including the National Wetland Inventory¹), aerial photographs and the direct observation of the hydrology of the stream that most of the discharge of the water body originates from large areas of regional wetlands unrelated to the landfill, including “Colebrook Swamp” to the west (the topographic relief of the landfill is relatively flat). Wetland flagging was observed along the perimeter of the landfill and, with the exception of a small reach on the northwestern side of the facility, the fill/debris does not encroach into the riparian zones of the perennial stream.

The flow of the stream is approximately 1 foot/second in the narrower segments but decreases markedly in the more diffuse emergent wetland areas. The bank stability is excellent with no evidence of

¹ Interactive ‘Wetlands Mapper’ at <http://www.fws.gov/wetlands/Wetlands-Mapper.html>

abnormal scour, erosion or channeling and the vegetation of the riparian zone, with the exception of forested canopy areas, covers a wide area that is fairly dense and robust. In most reaches, the substrate of the stream is comprised of cobble/gravel/sand and the presence of an adequate number of ‘riffles and runs’ within various stream segments causes cascading and turbulence of the water which, in turn, promotes oxygenation. There is also a nice distribution of snags, logs and coarse/fine particulate organic matter (woody debris, leaf packs) that is favorable for epifaunal colonization and fish cover. An inspection of these substrates revealed the presence of aquatic insect larvae such as chironomids, craneflies, mayflies and caddisflies. Some of these organisms appeared to be in the category of “pollution-sensitive”(e.g. Heptageniidae, Limnephilidae) which is a good indication of clean water. Frogs and turtles were also observed as were wetland-dependent birds. Overall, the water quality appears to be good to excellent with no discernible odors and a natural light brown hue that is due to the presence of tannins and humic acids. A typical reach of the stream is shown on the attached Photograph 1.

Both the water and the sediment quality did not appear to be affected by the presence of landfill debris. Indeed, natural succession occurring within the wetland observed on the northwestern side of the landfill (where some of the fill has encroached into the waterbody) appears to have compensated for any physical alteration that has occurred in the past (Photograph 2).

GROUNDWATER SAMPLING

Prior to collecting groundwater samples, seven existing wells (designated MW-5, MW-6, MW-7, SGA-01S, SGA-01D, SGA-03 and SGA-04) and the six new wells (HA-1 through HA-6) were developed by a combination of surging and evacuating groundwater until a minimum of 10 well volumes was removed. The purpose of well development was to reduce the amount of fine-grained material entering the wells from the surrounding formation.

It should be noted that existing groundwater monitoring well MW-4 was originally proposed to be sampled. This well is located in proximity to the landfill center. MW-4 was found to be damaged and therefore unable to be sampled.

Groundwater samples were collected in general accordance with the Environmental Protection Agency’s (EPA) Region 1 “Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells,” dated 9January2010, Revision 3. In summary, groundwater was purged from the well using a peristaltic pump with variable discharge rate. Purged groundwater was pumped to a flow-through cell to record field parameters, including pH, temperature, dissolved oxygen, turbidity, conductivity, and oxidation/reduction potential. In general, purging was continued until a minimum of three well volumes had been removed from the well, field parameters stabilized to within 10 percent for three consecutive readings, and turbidity was below 5 NTU, where possible.

The groundwater samples were collected and placed in laboratory prepared containers and stored on ice in the field prior to being submitted to Alpha Woods Hole Laboratory (Alpha), a Massachusetts Certified Laboratory, for analysis of VOCs, SVOCs, 1,4-dioxane, dissolved MCP metals, PCBs and

general chemistry parameters (alkalinity, chemical oxygen demand, chloride, physiologically available cyanide, total cyanide, nitrate, sulfate and total suspended solids).

No evidence of free product, sheen or petroleum odor was observed in groundwater from the wells. In addition, the headspace of each groundwater monitoring well was screened with a PID and a GEM2000 Landfill Gas Analyzer. No volatile organic compounds, methane or hydrogen sulfide were detected during screening and all oxygen and carbon dioxide levels were within the normal range.

ANALYTICAL RESULTS

Results of the laboratory testing of soil samples were compared to MCP, Method 1 GW-1 and GW-3 risk-based standards for MCP-related considerations. Results were also compared to Massachusetts drinking water standards and guidelines (Maximum Contaminant Levels, Drinking Water Guidelines, Recommended Concentration Limits and Secondary Maximum Contaminant Levels). Results were also generally compared to previous lab results to evaluate any differing site conditions that may have been encountered. Groundwater results are summarized in the attached Table V.

Chemical analysis for the groundwater at the subject site indicated the following:

- No compounds were detected above applicable risk-based MCP Method 1 GW-1 (drinking water) and GW-3 (surface water) standards.
- Alkalinity, nitrate, dissolved iron, dissolved manganese and dissolved sodium were detected above certain secondary parameters for drinking water in select wells.
- Within a few individual select wells, detections of SVOCs/VOCs (1,2,4-Trimethylbenzene, 2-Butanone,3-Methylphenol/4-Methylphenol, Bis(2-Ethylhexyl)phthalate, Naphthalene and Toluene) were noted. However, the results are all below the applicable standards noted in Table V. In addition, these detections were only specific to an individual well and there was no pattern of detection among multiple wells.
- Dissolved metals, and total/physiologically available cyanide were reported at concentrations well below the applicable standards noted in Table V.

A copy of the laboratory analytical results is included as Appendix C.

DISCUSSION

Based on the results summarized above and in Table V, we offer the following professional observations:

- No compounds were detected in groundwater above applicable risk-based standards established in the MCP, which are designed to be protective of human health, safety and the environment.
- Only one compound (3-methylphenol) that was detected in one well (HA-5) that does not have an established risk-based MCP standard. However the result of 6.1 ug/l is over 800 times lower than the MCP reportable concentration of 5,000 ug/l.
- For general water quality parameters that relate to drinking water aesthetics, color, taste and odor, there were exceedances of certain drinking water secondary and recommended levels in groundwater samples collected from locations directly adjacent to the landfill. The drinking water secondary and recommended levels which were exceeded include those for alkalinity, nitrate, dissolved solids, calcium, sodium, iron and manganese. These results are consistent with and typical for areas adjacent to a construction and demolition debris landfill
- Samples collected from upgradient (well HA-4) and downgradient wells (MW-5, MW-6, MW-7, SGA-04) did not have elevated levels of water quality parameters indicating overburden groundwater quality upgradient and downgradient to the landfill has not been adversely degraded from a drinking water perspective. The only exception is a low detection of manganese in wells MW-5 and MW-7. Manganese is naturally occurring and is often detected in elevated concentrations in groundwater and these detections have not been attributed to the landfill.
- Based on a comparison of the new data summarized in Table V to the historic groundwater data summarized in Table II, we state the following:
 - Metal concentrations in the new data are lower than the results collected by EPA. As previously stated, this observation is due to the recent samples being field filtered, which is consistent with MassDEP guidance and industry standard.
 - No new constituents were identified in groundwater above applicable standards as compared to previous historic results.
 - Historic laboratory analysis of groundwater samples detected total cyanide concentrations in four wells at low/estimated concentrations and detectable total cyanide concentrations in two wells (SGA-01S and SGA-05S). Total cyanide was only detected in one well (HA-1) at a very low concentration, while physiologically available cyanide was not detected in this same well. Cyanide was not detected in any other well sampled, including SGA-01S and well HA-5 located in proximity to SGA-05S.

CONCLUSIONS

Based on a review of the historic data and the recent groundwater sampling data, groundwater adjacent to the landfill is consistent with the localized impacts one would reasonably expect and is commonly associated with construction and demolition debris landfills. These impacts are based on “indicator” constituents and not chemicals that are resulting in a potential human health or environmental impact.

Groundwater located upgradient and downgradient to the landfill was absent of the “indicator” compounds that were previously detected adjacent to the landfill, indicating groundwater has not been adversely impacted by the landfill.

Initial groundwater flow patterns indicate that flow is radially from the landfill towards the nearby stream and that regional flow patterns are likely towards the southwest.

Surface water and the abundant wetland resource areas around the landfill initially indicate that stream’s hydrology is originating from the wetland areas and not the groundwater beneath the landfill.

USE OF INFORMATION AND LIMITATIONS

This summary report provides data and represents the chemical properties of the groundwater samples collected for this study.

The conclusions provided in this report by Haley & Aldrich, Inc. are based solely on the scope of services conducted and the sources of information discussed in this report. Any additional information that becomes available concerning this site should be provided to Haley & Aldrich, Inc., so that our conclusions and recommendations can be reviewed and modified if necessary. The work performed by Haley & Aldrich, Inc. is subject to the terms and conditions stated in our proposal. This work has been undertaken in accordance with generally accepted environmental consulting and engineering practices

Enclosures:

Table I: Summary of Historic Soil Quality Data

Table II: Summary of Historic Groundwater Quality Data

Table III: Summary of Historic Drinking Water Well Quality Data

Table IV: Summary of Historic Sediment Quality Data

Table V: Summary of Supplemental Groundwater Quality Data

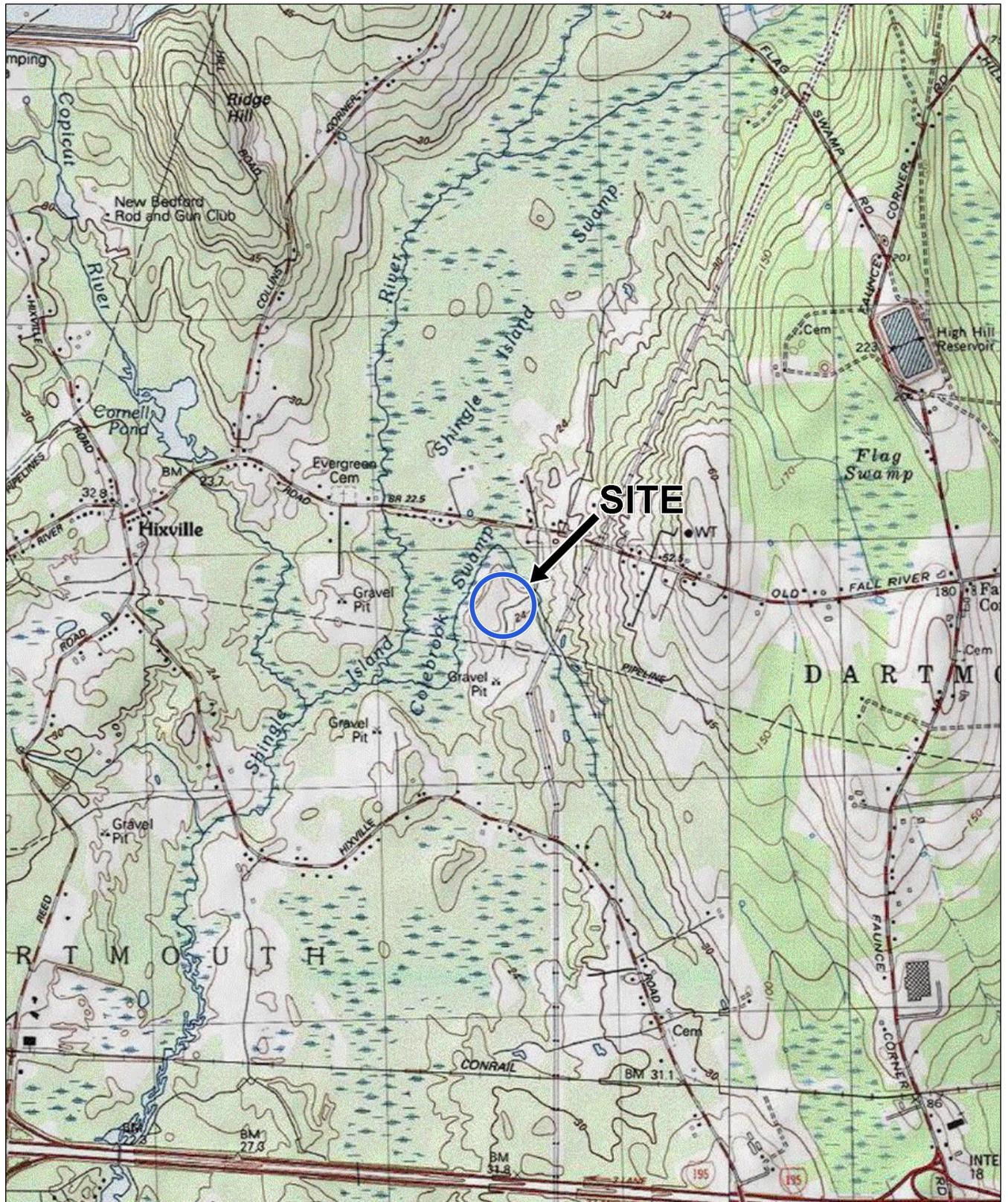
Figure 1: Project Locus

Figure 2: Site and Subsurface Exploration Location Plan

Stream Photographs

Appendix A: Observation Well Installation Logs and Well Sampling Logs

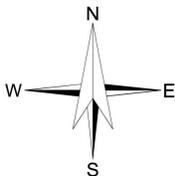
Appendix B: Laboratory Data Reports



SITE COORDINATES: 41°40'40"N, 71°0'40"W

HALEY & ALDRICH

CECIL SMITH LANDFILL
452 OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS



U.S.G.S. QUADRANGLE: FALL RIVER EAST, MA

PROJECT LOCUS

SCALE: 1:24,000
JUNE 2013

FIGURE 1



- LEGEND:**
- HA-1 DESIGNATION AND APPROXIMATE LOCATION OF OBSERVATION WELL INSTALLED BY GEOLOGIC EARTH EXPLORATION, INC. OF NORFOLK, MASSACHUSETTS AND MONITORED BY HALEY & ALDRICH, INC. DURING THE PERIOD 22 THROUGH 24 MAY 2013
 - SGA-05S DESIGNATION AND APPROXIMATE LOCATION OF EXISTING MONITORING WELL
 - SGA-05D DESIGNATION OF EXISTING MONITORING WELL NOT LOCATED IN FIELD
 - DW-1 DESIGNATION AND APPROXIMATE LOCATION OF DRINKING WATER SUPPLY WELL

- NOTES:**
1. IMAGE, DATED 2 APRIL 2012, TAKEN ELECTRONICALLY FROM GOOGLE EARTH PRO.
 2. SITE FEATURES TAKEN FROM PLAN TITLED "CECIL SMITH LANDFILL-CORRECTIVE ACTION DESIGN, EXISTING CONDITIONS PLAN", DATED 11 JANUARY 2013, BY SITEC ENVIRONMENTAL OF MARSHFIELD, MASSACHUSETTS.
 3. MONITORING WELL LOCATIONS TAKEN FROM PLAN TITLED: "MONITORING WELL AND SURFACE WATER ELEVATION DATA", PREPARED BY SITEC ENVIRONMENTAL OF MARSHFIELD, MASSACHUSETTS, DATED 17 JUNE 2013.



HALEY & ALDRICH CECIL SMITH LANDFILL
 452 OLD FALL RIVER ROAD
 DARTMOUTH, MASSACHUSETTS

SITE AND SUBSURFACE EXPLORATION LOCATION PLAN

SCALE: AS SHOWN
 JUNE 2013

FIGURE 2

J:\GRAPHICS\39899\39899-010-D004.DWG

A
 S: MMA HISTORIC GWA A DA
 S A D DA M H
 MASSA H S
 -010

SAMD WGD SAMD SAMD	MHD1 M00 GW-1	MHD1 M00 GW-	W												W d Ar d d r								
			A-1	A-	A-	A-	A-5	-1	-	-5	-	-	-W-	-W-	MW-1S SGA-01S	MW-1D SGA-01D	MW- SGA-0	MW- SGA-0	MW- SGA-0	MW-5S SGA-05S	MW-5D SGA-05D	MW- S SGA-0 S	MW- D SGA-0 D
			-D-1	-D-1	-D-1	-D-1	-D-1	5-1	5-1	5-1	5-1	5-1	5-1	1-1	1-1	St. Germain	St. Germain	St. Germain	St. Germain	St. Germain	St. Germain	St. Germain	St. Germain
Benzene	5	10000	NA	NA	NA	NA	NA	1	~	~	~	~	~	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	200	20000	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Total VOCs	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
S bis(2-ethylhexyl)phthalate	6	50000	NA	NA	NA	NA	NA	ND	ND	ND	5	ND	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Caprolactam	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Total SVOCs	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
M																							
Aluminum	NA	NA	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	~	~	150	~	~	~	~	~
Arsenic	10	900	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	~	~	~	~	~	~	~	~
Barium	2000	50000	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium	4	200	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	~	~	~	~	~	~	~	~
Cadmium	5	4	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	NA	NA	~	~	~	~	~	~	~	~	~	4200	~	18500	~	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	100	300	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	NA	NA	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	NA	NA	10400	~	~	~	~	~	~	~	~	~	80	~	~	940	~	~	~	~	~	~	~
Iron	NA	NA	~	~	~	~	~	~	~	~	~	6800	~	~	~	2500	~	~	~	~	~	~	~
Lead	15	10	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Magnesium	NA	NA	~	~	~	~	~	~	~	~	~	~	13000	~	~	9800	~	~	~	~	~	~	~
Manganese	NA	NA	~	~	~	~	~	~	~	~	~	6200	~	~	~	420	~	~	~	~	~	~	~
Mercury	2	20	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	100	200	1	~	~	~	~	~	~	~	~	~	~	~	~	80	~	~	~	~	~	~	~
Potassium	NA	NA	~	~	~	~	~	~	~	~	~	~	2400	ND	2300	~	~	~	~	~	~	~	~
Selenium	50	100	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	100	7	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	NA	NA	~	~	~	~	~	~	~	~	~	~	8800	ND	5500	~	~	~	~	~	~	~	~
Vanadium	30	4000	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	5000	900	500	~	~	~	~	~	~	~	~	~	110	ND	440	~	~	~	~	~	~	~	~
Total PCBs	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G Cyanide (ppb)	200	30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND

S A D A S
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 VOCs: Volatile Organic Compounds
 SVOCs: Semivolatile Organic Compounds
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 1. This table includes only those compounds detected on the dates indicated.

A
 S: MMA HISTORIC G DWA A DA
 S A D DA M H
 MASSA H S
 -010

SAM D W D SAM G DA SAM D	M H D 1 M 00 GW-1	M H D 1 M 00 GW-	GW-01 MW-01 1-00	GW-0 MW-0 1-00	GW-0 MW-0 1-00	GW-0 MW-0 1-00	GW-05 MW-05 1-00	GW-0 MW-0 1-00	GW-0 MW-0 1-00	GW-0 MW-0 1-00	GW-0 SGA-01S 1-00	GW-10 SGA-01D 1-00	GW-11 SGA-0 1-00	GW-1 SGA-0 1-00	GW-1 SGA-05S 1-00	GW-1 SGA-05D 1-00	GW-15 SGA-0 1-00
			EPA	EPA	EPA	EPA	EPA	EPA									
Benzene	5	10000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	200	20000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33	ND
Total VOCs	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33	ND
S bis(2-ethylhexyl)phthalate	6	50000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Caprolactam	NA	NA	22	ND	ND	ND	16	41	ND	ND	ND	ND	16	ND	10	ND	ND
Total SVOCs	NA	NA	22	ND	ND	ND	16	41	ND	ND	ND	ND	16	ND	10	ND	ND
M																	
Aluminum	NA	NA	ND	3740	14100	ND	261	273	3070	1020	1580	41700	ND	ND	ND	ND	ND
Arsenic	10	900	ND	ND	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	2000	50000	9.9 J	25.4	17.1	258	24.1	11.5 J	22.8	10.5 J	113	378	18.1	18.4	47.8	7.4 J	7.4 J
Beryllium	4	200	ND	0.24 J		ND	0.14 J	ND	0.17 J	ND	0.07 J	3.1	ND	ND	ND	ND	ND
Cadmium	5	4	ND	ND	2.2	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND	ND	ND
Calcium	NA	NA	2280	1200	21100	41300	1380	6560	1160	2760	13100	11900	72600	41600	12800	2870	2870
Chromium	100	300	85.3 J	ND	ND	ND	ND	ND	ND	ND	1.1	12 J	41.2 J	ND	ND	ND	ND
Cobalt	NA	NA	4.1	ND	47.8	ND	0.69	ND	ND	ND	4.1	7.5	ND	ND	ND	ND	ND
Copper	NA	NA	22.4 J	ND	6 J	12.1 J	ND	ND	ND	ND	41.5 J	36.1 J	8.2 J	ND	ND	ND	ND
Iron	NA	NA	543 J	1040 J	ND	14500 J	ND	227 J	820 J	1240 J	3030 J	28200 J	276 J	2950 J	110 J	ND	ND
Lead	15	10	ND	ND	ND	10	ND	ND	ND	ND	ND	0	ND	ND	ND	ND	ND
Magnesium	NA	NA	815	584	8380	3230	729	2330	509	1540	8050	11100	5230	3770	6450	1280	1280
Manganese	NA	NA	202	131	1880	236	403	123	124	17	184	742	318	358	221	ND	ND
Mercury	2	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	100	200	121 J	ND	91.0 J	4.8 J	2 J	ND	ND	ND	91.4 J	9.5 J	20.6 J	ND	ND	ND	ND
Potassium	NA	NA	961 J	1250 J	1720	1480 J	458 J	1130 J	1160 J	574 J	4700 J	6730 J	2250 J	1800 J	3260 J	950 J	950 J
Selenium	50	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	100	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	NA	NA	4580	3740	2950	4830	3420	6350	3900	6310	14400	19100	4610	8490	10400	3810	3810
Vanadium	30	4000	ND	1.2	ND	1.2	ND	ND	0.65 J	1.6	5.8	0.48 J	3.7	ND	ND	ND	ND
Zinc	5000	900	ND	ND	316	322	25.6	ND	ND	7.9 J	5.6 J	66.4	ND	ND	ND	ND	ND
Total PCBs	0.5	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G Cyanide (ppb)	200	30	2.6 J	2.2 J	ND	ND	ND	ND	ND	189	3.9 J	ND	ND	56	4.2 J	ND	ND

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 SVOCs: Semivolatile Organic Compounds
 PCBs: Polychlorinated Biphenyls
 1. This table includes only those compounds detected on the dates indicated.

SA
SMMAHISTORIC D GWA A DA
SAD
DA M H MASSA H S S
-010

W D SAM D SAM G DA SAM D	M 00 GW-1 	DW-01 DW-01 1 00 A	DW-0 DW-0 1 00 A
Methylene chloride	5	ND	0.24 J
Total VOCs	NA	ND	0.24
S Total SVOCs	NA	ND	ND
M Calcium Copper Iron Magnesium Potassium Sodium	NA 10000 NA NA NA NA	15700 6.8 29.2 2700 1410 J 11700	15700 7.6 23 2740 1430 J 11800
Total PCBs	0.5	ND	ND

SAD A S

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VOCs: Volatile Organic Compounds

SVOCs: Semivolatile Organic Compounds

PCBs: Polychlorinated Biphenyls

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A
 SMMMA HISTORIC S D M A DA A
 S A D DA M H
 MASSA H S
 -010

SAMD SAMDG DA	SD-01			SD-0		SD-0		SD-05		SD-0	
	11-1	10-0000	10-0000	10-0000	10-0000	10-0000	10-0000	10-0000	10-0000	10-0000	
W S A	MMSS	A	A	A	A	A	A	A	A	A	
2-Butanone	-	ND									
Acetone	-	ND									
Methyl Acetate	-	ND									
Total VOCs	-	ND									
S S											
Benzaldehyde	-	ND									
Benzo(a)anthracene	-	ND									
Benzo(a)pyrene	-	ND									
Benzo(b)fluoranthene	-	ND									
Benzo(k)fluoranthene	-	ND									
Chrysene	-	ND									
Fluoranthene	-	ND									
Indeno(1,2,3-cd)Pyrene	-	ND									
Pyrene	-	ND									
Total SVOCs	-	ND									
M											
Aluminum	-	ND									
Antimony	-	ND	ND	1.3	ND	ND	ND	ND	ND	ND	
Arsenic	-	ND									
Barium	-	ND									
Beryllium	-	1.4	1.1	ND							
Cadmium	-	ND	ND	0.12 J	ND	ND	ND	ND	ND	ND	
Calcium	-	ND									
Chromium	-	ND									
Cobalt	-	ND									
Copper	-	ND									
Iron	-	ND									
Lead	-	ND									
Magnesium	-	ND									
Manganese	-	ND									
Mercury	-	ND									
Nickel	-	ND									
Potassium	-	ND									
Selenium	-	ND									
Sodium	-	ND									
Vanadium	-	ND									
Zinc	-	ND									
d											
4,4'-DDE	-	ND									
4,4'-DDD	-	ND									
4,4'-DDT	-	ND									
Endosulfan II	-	ND									
d											
Aroclor 1242	~	ND									
Aroclor 1254	0.022	ND									
Total PCBs	0.022	ND									
G Cyanide (mg/kg)	-	ND									

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 PCBs: Polychlorinated Biphenyls
 1. This table includes only those compounds detected on the dates indicated.

S M M A S D M A D A
 S A D
 D A M H M A S S A H S
 -010

S A M G D A	S D-01 S D-0 S D-0 S D-0 S D-05					SD-01 SD-0		SD-0 SD-0		SD-05 SD-0		SD-0 SD-0 SD-0 SD-0 SD-0					SD-1 SD-15 SD-1 SD-1					
	00	00	00	10	11	00	00	00	00	00	00	00	00	00	00	00	00	00	00			
D	S G r	S G r	S G r	S G r	S G r	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
2-Butanone	ND	ND	ND	ND	ND	0.007 J	0.003 J	ND	-	0.029 J	0.028 J	0.016 J	-	0.14 J	0.006 J	ND	0.038 J	ND	0.11 J	-	ND	-
Acetone	ND	ND	ND	ND	ND	0.046	ND	ND	-	0.24 J	0.38 J	ND	-	1.2 J	0.045 J	0.019	0.27 J	0.025 J	0.59 J	-	ND	-
Methyl Acetate	ND	ND	ND	ND	ND	ND	ND	0.001 J	ND	ND	0.11 J	ND	-	ND	0.003 J	0.001 J	0.013 J	0.001 J	0.024 J	-	ND	-
Total VOCs	ND	ND	ND	ND	ND	0.053	ND	0.001	ND	0.269	0.518	0.016	-	1.34	0.054	0.02	0.321	0.026	0.724	-	ND	-
Benzaldehyde	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	0.18 J	-
Benzo(a)anthracene	12	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Benzo(a)pyrene	12	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Benzo(b)fluoranthene	9.8	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Benzo(k)fluoranthene	9.8	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Chrysene	13	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	0.19 J	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Indeno(1,2,3-cd)Pyrene	89	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	0.18 J	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Total SVOCs	145.6	ND	ND	ND	ND	ND	ND	ND	-	ND	0.37	ND	-	ND	ND	ND	ND	ND	ND	-	0.18	-
Aluminum	ND	ND	ND	ND	ND	719	693	922	895	4100	5630	6580	5820	2490	2650	2240	3860	2120	5510	720	4010	6890
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.2 J	2.1 J	2.7 J	ND	ND	ND	ND	ND	ND	2.1 J	2.5 J	2.5 J
Barium	ND	ND	ND	ND	ND	7.1	4.6	4.8	6.5	40.3	71.6	97.8	103	78	16.4	6.1	53.2	10.7	88	106	132	152
Beryllium	1.2	ND	ND	ND	1.2	0.01	0.15	0.07	0.07	1.1	0.74	3.7	3.3	0.73	0.18	0.12	0.94	0.15	0.83	2	2.1	0.93
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.15	0.25	0.36	0.36	0.2	0.07 J	ND	ND	ND	0.11 J	0.016	0.94	1.2
Calcium	ND	ND	ND	ND	ND	445 J	184 J	281 J	350 J	2060 J	4120 J	4590 J	3880 J	7820 J	939 J	284 J	4240 J	559 J	5900 J	4510 J	9510 J	8570 J
Chromium	ND	ND	ND	ND	ND	0.74	0.61	0.91	1	3.2	5.3	3.3	2.7	3	2	1.6	6.1	1.7	2.5	6.5	11.5	17.3
Cobalt	ND	ND	ND	ND	ND	ND	0.19 J	0.43	0.33	1.4	2.2	1.5	1.3	1.9	1.6	0.82	1.5	1.3	1.4	0.93	3.9	7.7
Copper	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.5	10.2	8.9	7.5	6.5	ND	ND	8	ND	11.6	21.8	17.9	22.2
Iron	ND	ND	ND	ND	ND	1500	616	1260	1180	2070	7570	1230	1010	2400	2910	2200	1800	2470	2140	2020	5540	12800
Lead	ND	ND	ND	ND	ND	3.8 J	ND	2.5 J	2.8 J	19.4	55.4	18.2	24.7	11.9	8.6	6.2	9	5.8	7.9	11.5	118	170
Magnesium	ND	ND	ND	ND	ND	142	120	297	259	312	722	702	638	885	489	434	727	457	1100	795	2130	2600
Manganese	ND	ND	ND	ND	ND	16.7	12.7	20.5	21.8	20.2	47.7	9.7	9.8	419	64.1	21	29	48.7	19	12.3	52.2	98.6
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.19 J	0.17 J	0.15 J	0.15 J	0.05 J	ND	ND	0.03 J	ND	0.13 J	0.26	0.10 J	0.13 J
Nickel	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.6	4.7	3.9	ND	ND	ND	ND	ND	ND	ND	10.8	14.5
Potassium	ND	ND	ND	ND	ND	ND	ND	123	ND	195	360	213	227	ND	175	194	197	165	199	221	375	720
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.9	2.9	4.2	3.5	3.1	ND	ND	1.9 J	ND	3.3	5.8	3.7	3.2
Sodium	ND	ND	ND	ND	ND	ND	75.2 J	65.4 J	49.0 J	218 J	315 J	640 J	579 J	264 J	106 J	87 J	360 J	80.8 J	381 J	687 J	486 J	452 J
Vanadium	ND	ND	ND	ND	ND	1.4	1.2	1.4	1.6	8.6	17.2	15.3	16.4	7.1	3.7	3.4	12	2.8	9.6	9.4	16.3	23
Zinc	ND	ND	ND	ND	ND	3.7 J	3.8 J	5.6 J	5.5 J	9.4 J	38.3 J	20.4 J	16.8 J	19.7 J	16.5 J	7.7 J	8.6 J	12.7 J	22.5 J	5.7 J	68.7 J	130 J
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	0.0038 J	ND	ND	-	0.0078 J	-
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	0.0058 J	0.0017 J	-	ND	0.011	ND	ND	0.01 J	ND	-	ND	-
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	0.003 J	-
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	0.0019 J	ND	-	ND	-
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Aroclor 1254	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Total PCBs	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Cyanide (mg/kg)	NA	NA	NA	NA	NA	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-

S A D A A S
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TABLE V - SUMMARY OF SUPPLEMENTAL GROUNDWATER QUALITY DATA
FORMER COLE BROOK PINES/ CECIL SMITH LANDFILL
452 OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS
File No. 39899-010

Location Name	MCP Method 1 GW-1 Standards	MCP Method 1 GW-3 Standards	Massachusetts Maximum Contaminant Levels (MMCLs)	Massachusetts Drinking Water Guidelines (ORSGs)	Massachusetts Recommended Concentration Limits (MRCLs)	Massachusetts Secondary Maximum Contaminant Levels (SMCLs)	HA-1 L1309671-01, L1309671-01 R1, L1309667-01 5/29/2013	HA-2 L1309671-02, L1309671-02 R1, L1309667-02 5/29/2013	HA-3 L1309742-04, L1309746-04 5/30/2013	HA-4 L1309671-03, L1309667-03 5/29/2013	HA-5 L1309879-03, L1309880-03 5/31/2013	HA-6 L1309879-04, L1309880-04 5/31/2013	MW-5 L1309671-04, L1309667-04 5/29/2013	MW-6 L1309742-02, L1309746-02 5/30/2013	MW-7 L1309742-03, L1309746-03 5/30/2013
Chemical Parameters															
pH					6.5 to 8.5		6.33	6.4	6.2	5.58	6.01	malfunctioning	4.36	6.00	5.22
Temperature (C)							11.7	12.6	11.7	11.75	14.2	13.85	11.71	12.8	13.6
Conductivity /Specific Conductance							862	685	557	0.285	0.346	0.068	0.077	54.0	1.151
Oxidation Reduction Potential							28.0	34.0	137.4	133.4	28.7	147.3	214.5	124.0	33.9
Dissolved Oxygen (mg/L)							0.33	0.79	2.8	0.26	0.12	0.45	0.53	3.75	0.24
Turbidity (NTU)							3.5	3	6	3.67	4.7	9.83	4.03	3.5	1.71
1,4 Dioxane by 8270D-SIM (ug/l)	3	50000		0.3	3		ND(0.15)	ND(0.158)	ND(0.165)	ND(0.156)	ND(0.15)	ND(0.16)	ND(0.157)	ND(0.164)	ND(0.16)
General Chemistry															
Alkalinity, Total (mg CaCO3/L)					30 to 100		421	414	190	23.4	107	8.8	2.7	11.9	2.3
Chemical Oxygen Demand (ug/l)							52000	64000	45000	22000	61000	71000	ND(20000)	29000	ND(20000)
Chloride (ug/l)					250000	250000	68000	27000	56000	21000	56000	7200	3000	5100	12000
Cyanide, Physiologically Available (ug/l)	200	30					ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Cyanide, Total (ug/l)	200	30			200	200	6	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Nitrogen, Nitrate (ug/l)			10000		10000	10000	4700	ND(100)	11800	6040	1350	ND(100)	ND(100)	424	943
Solids, Total Dissolved (ug/l)					500000		750000	580000	470000	120000	290000	99000	25000	45000	54000
Sulfate (ug/l)					250000		120000	76000	63000	ND(10000)	20000	17000	ND(10000)	ND(10000)	12000
MCP Dissolved Metals (ug/l)															
Arsenic, Dissolved	10	900	10		10		ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Barium, Dissolved	2000	50000	2000		2000		139	141	69	55	189	81	19	17	31
Cadmium, Dissolved	5	4	5		5		ND(4)	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)
Calcium, Dissolved					50000 to 150000		190000	140000	98000	14000	42000	5200	710	4800	6300
Chromium, Dissolved	100	300	100		100		ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Copper, Dissolved			1300		1300	1000	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Iron, Dissolved					300		360	510	ND(50)	ND(50)	7800	160	ND(50)	ND(50)	220
Lead, Dissolved	15	10	15		15		ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Manganese, Dissolved				50	50		412	9410	38	56	1300	364	122	11	87
Mercury, Dissolved	2	20	2		2		ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
Selenium, Dissolved	50	100	50		50		ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Silver, Dissolved	100	7				100	ND(7)	ND(7)	ND(7)	ND(7)	ND(7)	ND(7)	ND(7)	ND(7)	ND(7)
Sodium, Dissolved				20000	20000		23000	12000	29000	11000	20000	6800	2300	5000	6400
Zinc, Dissolved	5000	900			5000		ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	110	ND(50)	ND(50)	ND(50)
MCP Polychlorinated Biphenyls (ug/l)															
Total PCBs					40		ND	ND	ND	ND	ND	ND	ND	ND	ND
MCP Semivolatile Organics (ug/l)															
3-Methylphenol/4-Methylphenol	5000 ⁽²⁾						ND(5)	ND(5)	ND(5)	ND(5)	6.1	ND(5)	ND(5)	ND(5)	ND(5)
Bis(2-Ethylhexyl)phthalate	6	50000	6				ND(3)	ND(3)	ND(3)	3.8	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Total SVOCs							ND	ND	ND	3.8	6.1	ND	ND	ND	ND
MCP Volatile Organics (ug/l)															
1,2,4-Trimethylbenzene	200 ⁽³⁾	50000 ⁽³⁾					ND(2)	5.3	ND(2)						
2-Butanone	4000	50000		4000			ND(5)	ND(5)	ND(5)	ND(5)	7.3	ND(5)	ND(5)	ND(5)	ND(5)
Naphthalene	140	20000		140			ND(2)	6.2	ND(2)						
Toluene	1000	40000	1000		1000		ND(1)	ND(1)	ND(1)	ND(1)	4.1	ND(1)	ND(1)	ND(1)	ND(1)
Total VOCs							ND	11.5	ND	ND	11.4	ND	ND	ND	ND

NOTES:

- : Not analyzed
NA : Not applicable
ND(2.5): Not detected; number in parentheses is the laboratory reporting limit.

- This table includes only VOC, SVOC and PCB compounds detected on the dates indicated.
- RCGW-1 reportable concentration shown for this compound.
- C9-C10 Standard shown for this compound, which is inclusive of trimethylbenzene compounds.

TABLE V - SUMMARY OF SUPPLEMENTAL GROUNDWATER QUALITY DATA
FORMER COLE BROOK PINES/ CECIL SMITH LANDFILL
452 OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS
File No. 39899-010

Location Name	MCP Method 1 GW-1 Standards	MCP Method 1 GW-3 Standards	Massachusetts Maximum Contaminant Levels (MMCLs)	Massachusetts Drinking Water Guidelines (ORSGs)	Massachusetts Recommended Concentration Limits (MRCLs)	Massachusetts Secondary Maximum Contaminant Levels (SMCLs)	SGA-01S L1309879-02, L1309880-02 5/31/2013	SGA-01D L1309879-01, L1309880-01 5/31/2013	SGA-03 L1309578-01, L1309672-01 5/28/2013	SGA-04 L1309742-01, L1309746-01 5/30/2013
Chemical Parameters										
pH					6.5 to 8.5		5.18	6.79	6.51	5.17
Temperature (C)							12.3	11.8	11.2	10.28
Conductivity /Specific Conductance							78.5	176	371.1	0.083
Oxidation Reduction Potential							96.2	163.5	156.6	249.1
Dissolved Oxygen (mg/L)							0.93	3.02	0.83	0.64
Turbidity (NTU)							3.5	1.8	2.06	0.92
1,4 Dioxane by 8270D-SIM (ug/l)	3	50000		0.3	3		ND(0.167)	ND(0.165)	ND(0.174)	ND(0.15)
General Chemistry										
Alkalinity, Total (mg CaCO3/L)					30 to 100		5.3	52.1	214	13.2
Chemical Oxygen Demand (ug/l)							43000	ND(20000)	20000	ND(20000)
Chloride (ug/l)					250000	250000	19000	15000	12000	3700
Cyanide, Physiologically Available (ug/l)	200	30					ND(5)	ND(5)	ND(5)	ND(5)
Cyanide, Total (ug/l)	200	30			200	200	ND(5)	ND(5)	ND(5)	ND(5)
Nitrogen, Nitrate (ug/l)			10000		10000	10000	ND(100)	3900	478	118
Solids, Total Dissolved (ug/l)					500000		96000	130000	330000	43000
Sulfate (ug/l)					250000		ND(10000)	21000	42000	ND(10000)
MCP Dissolved Metals (ug/l)										
Arsenic, Dissolved	10	900	10		10		ND(5)	ND(5)	ND(5)	ND(5)
Barium, Dissolved	2000	50000	2000		2000		13	63	30	11
Cadmium, Dissolved	5	4	5		5		ND(4)	ND(4)	ND(4)	ND(4)
Calcium, Dissolved					50000 to 150000		4000	16000	84000	3500
Chromium, Dissolved	100	300	100		100		ND(10)	ND(10)	ND(10)	ND(10)
Copper, Dissolved			1300		1300	1000	ND(10)	ND(10)	ND(10)	ND(10)
Iron, Dissolved						300	1100	ND(50)	ND(50)	ND(50)
Lead, Dissolved	15	10	15		15		ND(10)	ND(10)	ND(10)	ND(10)
Manganese, Dissolved				50		50	48	ND(10)	248	ND(10)
Mercury, Dissolved	2	20	2		2		ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
Selenium, Dissolved	50	100	50		50		ND(10)	ND(10)	ND(10)	ND(10)
Silver, Dissolved	100	7				100	ND(7)	ND(7)	ND(7)	ND(7)
Sodium, Dissolved				20000	20000		9400	12000	7700	5800
Zinc, Dissolved	5000	900				5000	ND(50)	ND(50)	ND(50)	ND(50)
MCP Polychlorinated Biphenyls (ug/l)										
Total PCBs					40		ND	ND	ND	ND
MCP Semivolatile Organics (ug/l)										
3-Methylphenol/4-Methylphenol	5000 ⁽²⁾						ND(5)	ND(5)	ND(5)	ND(5)
Bis(2-Ethylhexyl)phthalate	6	50000	6				ND(3)	ND(3)	ND(3)	ND(3)
Total SVOCs							ND	ND	ND	ND
MCP Volatile Organics (ug/l)										
1,2,4-Trimethylbenzene	200 ⁽³⁾	50000 ⁽³⁾					ND(2)	ND(2)	ND(2)	ND(2)
2-Butanone	4000	50000		4000			ND(5)	ND(5)	ND(5)	ND(5)
Naphthalene	140	20000		140			ND(2)	ND(2)	ND(2)	ND(2)
Toluene	1000	40000	1000		1000		ND(1)	ND(1)	ND(1)	ND(1)
Total VOCs							ND	ND	ND	ND

NOTES:

- : Not analyzed
NA : Not applicable
ND(2.5): Not detected; number in parentheses is the laboratory reporting limit.

1. This table includes only VOC, SVOC and PCB compounds detected on the dates indicated.
2. RCGW-1 reportable concentration shown for this compound.
3. C9-C10 Standard shown for this compound, which is inclusive of trimethylbenzene compounds.