

January 20, 2016

Ms. Stacy Ladner
Unit Manager
Division of Oil & Hazardous Waste Facility Regulation
Bureau of Remediation and Waste Management
Maine Department of Environmental Protection
17 State House Station
Augusta ME 04333

**Subject: Third Quarter 2015 Groundwater Monitoring Results
Orrington Remediation Site
Orrington, Maine**

Dear Ms. Ladner:

Enclosed for your information is a report of the **third quarter 2015** groundwater sampling data for the monitoring performed at the Orrington Remediation Site by Sevee & Maher Engineers, Inc. (SME). The groundwater monitoring was performed using the low flow sampling protocols described in the Work Plan submitted July 8, 2010.

This groundwater monitoring report includes data summary tables, a figure showing the well locations sampled and field data sheets. Electronic data deliverables (EDDs) and laboratory analytical reports were previously submitted to Maine DEP on October 27 and December 23, 2015, and January 4, 2016 as described in this report.

The fourth quarter 2015 groundwater monitoring event took place in December 2015. If you have any questions please feel free to contact me at 314-281-5947.

Sincerely,



Kathy Zeigler
Director, Environmental Remediation

Cc: John Beane, DEP
Audrey Snowden, Town Librarian, Town of Orrington
Paul White, Town Manager, Town of Orrington

January 20, 2016

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Kathryn Zeigler
Director, Environmental Remediation
Mallinckrodt US LLC
444 McDonnell Boulevard
Hazelwood, Missouri 63042

Subject: Transmittal of the Third Quarter 2015 Groundwater Quality Sampling Results
Orrington Remediation Site, Orrington, Maine

Dear Ms. Zeigler:

Enclosed are the groundwater quality results from the August 2015 third quarter sampling event at the Orrington Remediation Site in Orrington, Maine (Site). Groundwater samples were obtained from 27 monitoring wells located in the vicinity of the southwestern portion of the Site (Ferry Road Area), the former Manufacturing Area, Landfill 1 Area, Landfill 3, Landfill 4 and Landfill 5. The locations of the wells are identified in the attached Figure 1. Low-flow sampling protocols consistent with procedures requested by the Maine Department of Environmental Protection (MEDEP) in September 2010 were utilized to obtain unfiltered groundwater samples. Sevee & Maher Engineers, Inc. (SME) also obtained water samples from the domestic water pressure tank inside two residences (Haseltine and Safian) on Ferry Road that are routinely tested during the quarterly sampling events. The water samples from the residential property were obtained using the methods consistent with the previous quarterly sampling events. Three dry wells and two wells with an insufficient amount of water prevented groundwater samples from being obtained at their locations.

Laboratory analyses were provided by Katahdin Analytical Services (Katahdin) and Alpha Analytical, located in Scarborough, Maine and Westborough, MA, respectively. Groundwater quality results are summarized in attached Tables 1 through 8. Electronic data deliverables containing the laboratory analytical data reports were submitted to MEDEP electronically on October 27 and December 23, 2015, and January 4, 2016. SME field data sheets completed at each well sampled are included in the attachments to the transmittal.

QUALITY CONTROL REVIEW

A review of the laboratory and field quality control (QC) data indicated acceptable data quality for the August 2015 third quarter groundwater laboratory results. Method and preparation blanks, laboratory control samples (LCS), laboratory duplicates, matrix spikes (MS), matrix spike duplicates (MSD), and surrogate compound recoveries for the laboratory analyses were evaluated. Trace concentrations (i.e., less than the Practical Quantitation Limit [PQL] or Reporting Limit) of methylene chloride and carbon disulfide were detected in two different volatile organic analysis method blanks. Neither of these volatile organic compounds (VOCs) negatively affected the data quality. Methylene chloride, which was also present in a groundwater sample (MW-510-O1) associated with the method blank, is used as a laboratory solvent and is considered a common laboratory contaminant. The methylene chloride in the method blank and MW-510-O1 was at levels that allowed the groundwater sample concentration to be reported as a not detected at the PQL consistent with guidance in the 2014 *National Functional Guidelines* for organic data review.¹ Carbon disulfide was not detected in any of the groundwater samples. Detectable concentrations of mercury, total recoverable phenolics, total organic carbon (TOC), total organic halides (TOX) and alkalinity were not present in their respective method blanks. Trace concentrations of metals (iron, sodium and manganese) and inorganic analytes (chloride and sulfate) were detected in some method blanks associated with monitoring wells around Landfill 5. Sample results affected by the metals and inorganics detected in the method blanks were flagged in the data tables.

Chloromethane was recovered at a concentration less than the lower recovery QC limit in a LCS spiked with volatile organic compounds (VOCs) that was associated with the Landfill 5 Area monitoring wells. The chloromethane results for the Landfill 5 Area monitoring wells were qualified to reflect a potential for biased low recovery. However, the LCS exceedance was of no significance because chloromethane was not detected in samples obtained from the Landfill 5 Area. MS/MSD VOC spiked recoveries associated with the MW-506-B1 groundwater sample obtained in Landfill 4 were greater than 20 percent, but less than the lower QC acceptance limit. Therefore, the two VOCs detected in MW-506-B1 were qualified as estimated ("J"), and the non-detected compounds were qualified ("UJ") as not detected at a level greater than or equal to the estimated adjusted reporting limit. The MSD spike recovery associated with the mercury detected in the MW-506-B1 groundwater sample did not apply because the sample concentration was more than four times the amount of the spike concentrations added to the sample.²

¹ U.S.EPA, 2014. *National Functional Guidelines for Superfund Organic Methods Data Review*; Office of Superfund Remediation and Technology Innovation, U.S.EPA-540-R-014-002; Washington, DC; August 2014.

² U.S.EPA, 2014. *National Functional Guidelines for Inorganic Superfund Data Review*; Office of Superfund Remediation and Technology Innovation, U.S.EPA-540-R-013-001; Washington, DC; August 2014.

Surrogate compounds were added by the laboratory to groundwater samples, and laboratory QC samples (method blanks, LCS, MS and MSD) to assess sample matrix effects and laboratory performance associated with the analysis of VOCs. Carbon tetrachloride and chloropicrin were determined by U.S.EPA Method 8011, and the remaining suite of VOCs by U.S.EPA Method 8260B. Surrogate recoveries for the U.S.EPA Method 8260B analysis in the routine groundwater sampling program were within the QC acceptance limits. The U.S.EPA Method 8011 surrogate recoveries for a few groundwater samples were outside the laboratory acceptance criteria, but did not significantly affect the data quality because either (1) the target compounds were not detected in the groundwater samples (B-303-B3 and MW-502-O1), (2) dilution was required to quantitate the influent sample, which resulted in no recovery of the surrogate, or (3) the surrogate recovery in the LCS slightly exceeded the upper range of the acceptance criteria, but was within the method allowances. Therefore, the results were accepted as reported.

The sampling process and field and sample transport conditions were evaluated in laboratory-supplied trip blanks, and in field blanks and duplicate groundwater samples that were obtained in the field during the sampling round. Traces of acetone and methylene chloride, both common laboratory contaminants, were detected two of the trip blanks (Table 8). Three field blanks associated with the former Manufacturing Area, Landfill 1 Area, and Landfill 5 were prepared with laboratory-supplied deionized water and analyzed for the parameters tested in these areas. The field blank associated with the Landfill 1 Area monitoring wells contained a trace concentration of chloride; however, the chloride detections in the groundwater samples were significantly greater than the QC blank action level and the concentrations were accepted as reported. Trace levels of iron, manganese, sodium, sulfate, acetone, methylene chloride, toluene, TOC and TOX were detected the field blank prepared near Landfill 5. Groundwater sample concentrations of sodium and sulfate were sufficiently greater than the reporting limit and did not require any blank actions. Appropriate qualifiers consistent with U.S.EPA *Environmental Data Review Supplement*³ were applied to groundwater sample concentrations for the remainder of the analytes affected by the detections in the Landfill 5 field blank.

Five duplicate sample pairs from different areas of the Site were submitted to the laboratory for analysis. Relative percent differences (RPDs) were calculated for all analytes of a sample

³ U.S.EPA New England, 2013; *Environmental Data Review Supplement*, Quality Assurance Unit, U.S.EPA New England; April 22, 2013.

duplicate pair for organic concentrations greater than or equal to twice the sample quantitation limit, and for inorganic concentrations greater than or equal to five times the sample quantitation limit. RPDs for the analytes in the sample duplicate pairs ranged between zero to 20 percent, achieving the U.S.EPA Region 1 criteria of not exceeding 30 percent.³ The evaluation of duplicate sample pairs indicated acceptable precision for the August 2015 sampling round.

LABORATORY ANALYTICAL RESULTS

Detectable mercury concentrations were present in groundwater samples obtained from 11 of the 27 monitoring wells sampled during the third quarter August 2015 sampling round. The distribution of mercury detections among the monitoring wells routinely sampled was consistent with the groundwater quality of the previous quarterly sampling events. Mercury concentrations ranged from 0.00075 to 0.458 milligrams per liter (mg/L) in these wells. The Site's Media Protection Standard (MPS) for mercury (0.002 mg/L) was exceeded in nine monitoring wells. Mercury in the groundwater beneath the Landfill 1 Area continues to be the highest just downgradient of the Lined Process Lagoon in monitoring well MW-501-O1, and at western margin of the Landfill 1 Area in B-326-03. Two of the Landfill 1 Area interim extraction wells (EW-1 and MW-601) in the vicinity of B-326-03, captured groundwater with mercury at concentrations in the order of magnitude of that detected in B-326-03. The Interim Extraction System has been operational since January 2015, and includes four extraction wells installed in 2014 along with older extraction well MW-601.

Downgradient of the former salt storage pad in the former Manufacturing Area, the mercury concentration in monitoring well MW-510-O1 (0.0066 mg/L) exceeded the MPS. North of the former salt storage pad, the mercury concentration in MW-502-O1 (0.0007 mg/L) was less than the MPS as it has been for several years. An insufficient amount of water in the well MW-503-O1, located to the south of the former salt storage pad, prevented a sample from being obtained during the August 2015 sampling round. When sufficient water is available in MW-503-O1, the mercury concentration is almost always less than the MPS.

Landfills 3, 4 and 5 are located along the landfill ridge to the northeast of the Landfill 1 Area and north of the former Manufacturing Area. Mercury concentrations in the landfill ridge wells sampled during August 2015 ranged from non-detects (less than 0.0002 mg/L) to 0.0707 mg/L. The highest mercury concentration was detected in MW-506-B1, which monitors groundwater beneath Landfill 4. Mercury MPS exceedance has been typical for MW-506-B1 over its record of sampling. Mercury concentrations decreased as groundwater travels southeasterly downgradient of Landfills 3 and 4 by monitoring well MW-410-B1 (0.0023 mg/L) and P-2A (0.0019 mg/L). Consistent with previous quarterly sampling rounds, detectable

mercury was not present in groundwater samples obtained (1) to the north of Landfills 3 and 4 (B-309-B1 and P-13), (2) around Landfill 5, or (3) in the southwestern portion of the Site between the former Manufacturing Area and Ferry Road. Mercury was not detected in the two residential wells on Ferry Road, which is consistent with previous water quality results.

Groundwater in the former Manufacturing Area was analyzed for chloropicrin in monitoring wells MW-502-O1 and MW-510-O1, and in MW-501-O1 near the Lined Process Lagoon at the Landfill 1 Area. Chloropicrin was not detected in any of these three wells during the August 2015 sampling round, which is consistent with previous water quality history for MW-501-O1 and MW-501-O2. Occasional detections of chloropicrin have occurred in MW-510-O1; however, the chloropicrin detections have been less than the MPS of 30 µg/L since March 2011.

Groundwater samples in the former Manufacturing Area and around Landfills 3, 4 and 5 were submitted for analysis of VOCs. Detectable concentrations of VOCs were identified for five analytes, distributed among 10 Site monitoring wells: carbon tetrachloride, chloroform, trichloroethene, 1,1-dichloroethene, and dichlorodifluoromethane. The MPS for carbon tetrachloride (3 µg/L) was exceeded in groundwater from MW-506-B1 (9.7 µg/L), screened beneath Landfill 4, and in MW-410-B1 (18 µg/L) and P-2A (11 µg/L) downgradient of Landfills 3 and 4. The concentrations of chloroform, trichloroethene, and dichlorodifluoromethane detected in groundwater were less than their MPS, or the Maine Maximum Exposure Guideline (MEG) if an MPS did not exist for the compound.

The third quarter August 2015 sampling round incorporated semiannual detection monitoring at Landfill 5 for sodium, chloride, sulfate, iron, manganese, total recoverable phenolics, TOC and TOX in wells B-304-B1, B-307-B1 and B-307-B2. Three shallow wells, i.e., B-304-O1, B-306-B3 and B-307-O1, were either dry contained an insufficient amount of water to obtain a groundwater sample.

Sodium concentrations in groundwater around Landfill 5 ranged from 5.8 to 89 mg/L, exceeding the Maine MEG of 20 mg/L in B-304-B1. Concentrations of chloride (2.5 to 48 mg/L) and sulfate (15 to 32 mg/L) in the groundwater around Landfill 5 were less than their Federal Secondary Maximum Contaminant Level of 250 mg/L for each parameter. The range of concentrations for the sodium, chloride and sulfate in the August 2015 sampling round was similar to the previous detection monitoring results from March 2015. Trace to very low concentrations of iron and manganese were present in the three detection monitoring wells sampled. However, method blanks and the field blank associated with these samples also contained trace levels of iron and manganese. Therefore, some of the iron and manganese inorganic results for B-307-B2 were qualified as not detected consistent with the *National*

Functional Guidelines (August 2014).² The highest detections of manganese (0.044 mg/L) and iron (0.08 mg/L) were in B-304-B1, concentrations that were well below the MPS for manganese (0.5 mg/L) and the Maine MEG for iron (5 mg/L).

Total recoverable phenolics were detected in B-304-B1 at 25 µg/L, a concentration that was less than the analyte's reporting limit and well below the Maine MEG of 2,000 µg/L. TOC was detected in replicate groundwater samples obtained around Landfill 5 during the August 2015 sampling round. One of the replicate samples for the field blank had an estimated concentration of TOC slightly greater than the method detection limit (MDL); the remaining three replicate samples in the field blank were non-detects for TOC. Therefore, the TOC results were accepted as reported by the laboratory. The monitoring wells sampled around Landfill 5, and the Landfill 5 field blank, also contained trace concentrations of TOX in several of the replicate samples. As a consequence, the TOX results were qualified as not detected at the laboratory reporting limit.

An influent sample of groundwater from the combined flow from the Landfill 1 Area Interim Extraction System was obtained at the groundwater treatment plant onsite and submitted to the laboratory for analysis. Analytical results for the influent sample are summarized in Table 7. Mercury, VOCs, and chloropicrin concentrations in the influent sample were within the historical range of groundwater quality associated with the Landfill 1 Area.

GROUNDWATER QUALITY SUMMARY

A summary of the August 2015 third quarter sampling round results that exceeded the Site MPS indicated the following groundwater quality:

- Landfill 1 Area – The MPS for mercury (0.002 mg/L) was exceeded in monitoring wells B-326-O2, B-326-O3, MW-402-O1, MW-501-O1, MW-512-O1 and MW-513-O1 (0.0066 to 0.458 mg/L). The mercury distribution is comparable with previous sampling rounds.
- Former Manufacturing Area – Mercury was detected in MW-510-O1 (0.0065 mg/L), which is consistent with past results.
- Landfills 3 and 4 – Mercury was detected in MW-506-B1 (0.0707 mg/L) at Landfill 4, and in MW-410-B1 (0.0022 mg/L), near-downgradient of Landfills 3 and 4. Carbon tetrachloride was detected in MW-506-B1 (9.7 µg/L), MW-410-B1 (18 µg/L) and P-2A (11 µg/L) at concentrations greater than the MPS (3 µg/L). The distribution of mercury and carbon tetrachloride along the landfill ridge area is consistent with the history of groundwater monitoring.

- Landfill 5 – Detectable mercury was not present in the monitoring wells sampled during the August 2015 sampling event, which is consistent with the water quality record of these locations.
- Ferry Road Area and Residential Wells – Mercury was not detected in the southeastern part of the Site or in the two residential wells sampled on Ferry Road, which is consistent with the past five years of routine monitoring.

WATER LEVEL MONITORING

Groundwater elevations in wells monitored averaged about a 1.5-foot decrease site-wide during the period between the June 2015 and August 2015 sampling events, a pattern that is typical for the setting of a temperate climate in the latter part of the summer. The magnitude of groundwater elevation decrease was generally greater in monitoring wells located in the higher topography along the landfill ridge (Landfills 3, 4 and 5). The groundwater elevation decrease along the landfill ridge varied from about 1.2 to 4 feet. In the lower topographic portions of the Site (former Manufacturing Area, Landfill 1 Area and Ferry Road Area), the water level elevations in August 2015 averaged about a 1 foot less compared to the June 2015 sampling round. The water levels in several Site wells located in the lower topography closer to the Penobscot River (e.g., Landfill 1 Area) are affected by the daily tidal cycle. The tide in the Penobscot River fluctuates in the order of 12 to 14 feet adjacent to the Site on a daily basis, which results in a daily variation of 1.5 to 3 feet in the wells that are tidally-influenced by the River. Many of the water levels measured in the third quarter of 2015 were similar to groundwater elevations in the third quarter of 2014; although greater differences were generally associated with the tidally-influenced wells.

Below normal precipitation occurred during the period between the June and August 2015 sampling rounds based on the daily information collected at the Site weather station, which recorded a total of about 5.5 inches of rainfall. The amount of rainfall measured at the Site agreed very closely with the data reported at the nearby Bangor International Airport (NOAA National Climatic Data Center).⁴ Abnormally dry conditions were also reported for the region for the period since the middle of May 2015 through the August 2015 sampling round (U.S. Drought Monitor).⁵

⁴ *Record of Climatological Observations, Bangor International Airport, ME*. National Climatic Data Center Federal Building, Asheville, North Carolina, <http://www.ncdc.noaa.gov> (accessed December 17, 2015).

⁵ *U.S. Drought Monitor*, (<http://droughtmonitor.unl.edu>), accessed December 17, 2015.

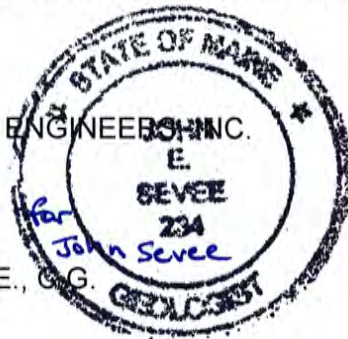
The fourth quarter 2015 groundwater sampling event at the Orrington Remediation Site was conducted during the week of December 7, 2015. In addition to the routine monitoring, groundwater samples were obtained from the five interim groundwater extraction wells that are operating in the Landfill 1 Area. If you have any questions concerning the August 2015 groundwater quality results, please do not hesitate to contact Bill Metzger or me.

Very truly yours,

SEVEE & MAHER ENGINEERS INC.



John E. Sevee, P.E., C.G.



Attachments:

- Figure 1 – Well Locations
- Groundwater Monitoring Results Summary - Tables 1 through 8
- Data Tables
- Relative Percent Difference for Duplicate Samples
- Field Data Sheets
- Electronic Data Deliverable and Laboratory Analytical Reports

**WELL LOCATIONS
FIGURE 1**

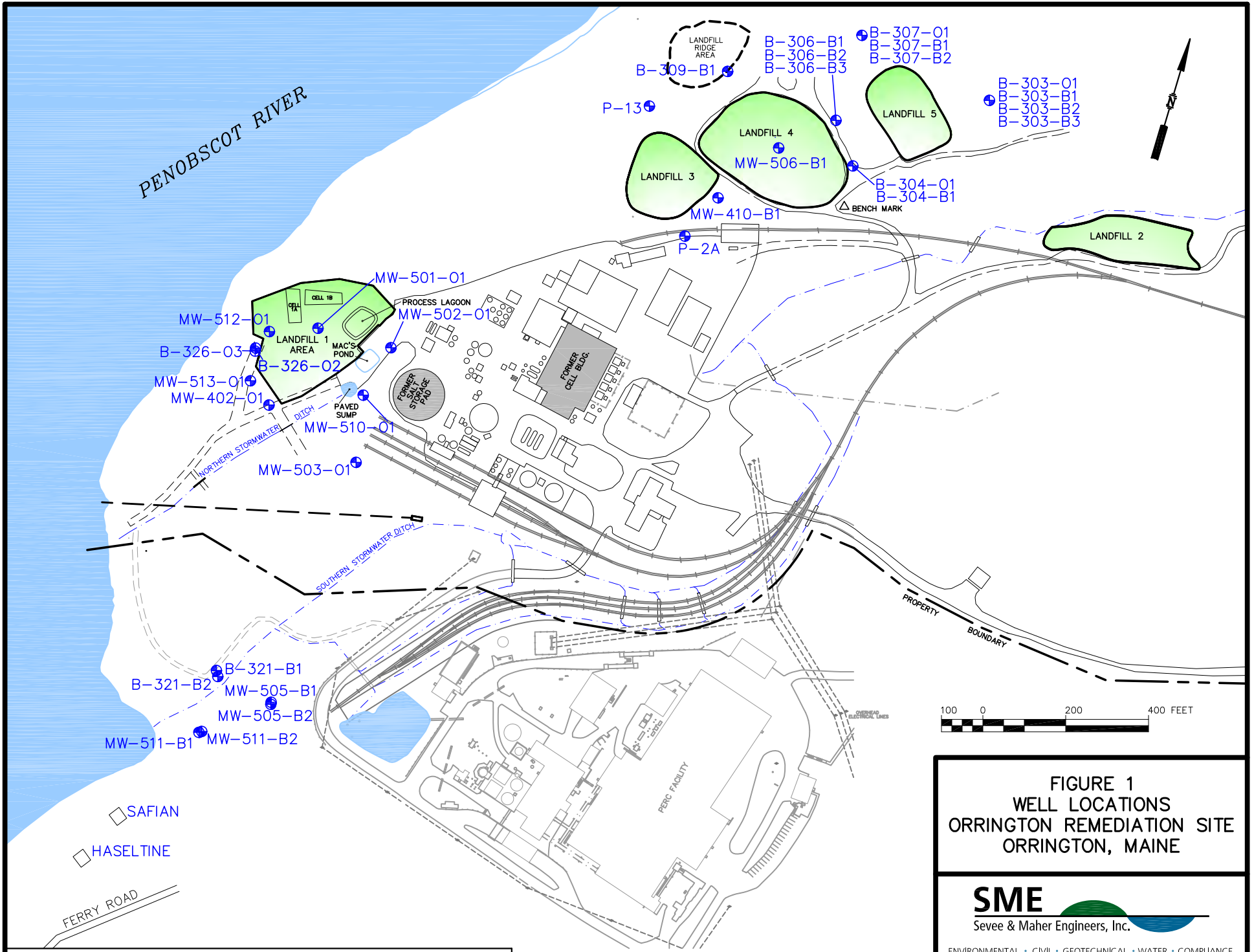


FIGURE 1
WELL LOCATIONS
ORRINGTON REMEDIATION SITE
ORRINGTON, MAINE

SME
 Sevee & Maher Engineers, Inc.

ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

**GROUNDWATER MONITORING RESULTS SUMMARY
TABLES 1 THROUGH 8**

TABLE 1
THIRD QUARTER AUGUST 2015
GROUNDWATER MONITORING RESULTS

Ferry Road Monitoring Well Locations									
Parameters	Hazeltine	(DUP-2) Hazeltine	Safian	B-321-B1	B-321-B2	MW-505-B1	MW-505-B2	MW-511-B1	MW-511-B2
	08/04/15	08/04/15	08/04/15	08/04/15	08/04/15	08/05/15	08/05/15	08/05/15	08/05/15
Mercury (mg/L)	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chloride (mg/L)	1,500	1,500	670	1,700	830	2,200	2,200	2,800	2,200
Specific Conductance (µS/cm @25°C)	4,693	NA	2,148	5,363	3,002	8,796	6,615	7,985	7,153
pH (Standard Units)	7.41	NA	7.18	7.1	7.15	7.09	7.14	7.02	7.11
Temperature (Degrees Celcius)	12	NA	17.3	10.9	10.5	10.6	10.6	12.6	11
Salinity (g/L)	2.59	NA	1.13	2.98	1.61	5.07	3.73	4.57	4.06
Turbidity (field) (NTU)	1.4	NA	12.3	0.6	3.9	0.2	0.2	0.6	0.4
Dissolved Oxygen (mg/L)	6	NA	1	0.5	1.5	0.1	0.3	< 0.1	0.3
VOCs									
Acetone (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Tetrachloride (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Disulfide (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyltertiarybutylether (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloropicrin (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abbreviations:

NA = Parameter is not included in routine quarterly monitoring

< = Not detected above the reported sample detection limit

TABLE 2
THIRD QUARTER AUGUST 2015
GROUNDWATER MONITORING RESULTS

Former Manufacturing Area Monitoring Well Locations					
Parameters	MW-502-O1	MW-503-O1	MW-510-O1	(DUP-4) MW-510-O1	(FB-1) Field Blank
	08/05/15	08/06/15	08/06/15	08/06/15	08/05/15
Mercury (mg/L)	0.00075	I	0.00655	0.0066	< 0.0002
Specific Conductance (µS/cm @25°C)	1,879	I	50,101	--	--
pH (Standard Units)	7.81	I	7.47	--	--
Temperature (Degrees Celcius)	15.7	I	14.8	--	--
Salinity (g/L)	0.98	I	33.96	--	--
Turbidity (field) (NTU)	0.1	I	0.7	--	--
Dissolved Oxygen (mg/L)	5.1	I	4	--	--
VOCs					
Acetone (µg/L)	< 5	I	< 5	< 5	< 5
Methylene Chloride (µg/L)	< 5	I	< 5	< 5	< 5
Chloroform (µg/L)	2.6	I	6.7	6.4	< 1
Carbon Tetrachloride (µg/L)	< 0.112	I	1.21	1.24	< 0.1
Benzene (µg/L)	< 1	I	< 1	< 1	< 1
Toluene (µg/L)	< 1	I	< 1	< 1	< 1
Ethylbenzene (µg/L)	< 1	I	< 1	< 1	< 1
Carbon Disulfide (µg/L)	< 1	I	< 1	< 1	< 1
o-Xylene (µg/L)	< 1	I	< 1	< 1	< 1
m,p-Xylene (µg/L)	< 2	I	< 2	< 2	< 2
Methyltertiarybutylether (µg/L)	< 1	I	< 1	< 1	< 1
Trichloroethene (µg/L)	< 1	I	< 1	< 1	< 1
Naphthalene (µg/L)	< 2	I	< 2	< 2	< 2
1,1-Dichloroethene (µg/L)	< 1	I	< 1	0.37 J	< 1
Dibromochloromethane (µg/L)	< 1	I	< 1	< 1	< 1
Tetrachloroethene (µg/L)	< 1	I	< 1	< 1	< 1
Bromodichloromethane (µg/L)	< 1	I	< 1	< 1	< 1
Bromoform (µg/L)	< 1	I	< 1	< 1	< 1
1,1,1-Trichloroethane (µg/L)	< 1	I	< 1	< 1	< 1
1,1,2-Trichloroethane (µg/L)	< 1	I	< 1	< 1	< 1
cis-1,2-Dichloroethene (µg/L)	< 1	I	< 1	< 1	< 1
Chloroethane (µg/L)	< 2	I	< 2	< 2	< 2
Chloromethane (µg/L)	< 2	I	< 2	< 2	< 2
Bromomethane (µg/L)	< 2	I	< 2	< 2	< 2
Dichlorodifluoromethane (µg/L)	< 2	I	< 2	< 2	< 2
Chloropicrin (µg/L)	< 0.112	I	< 0.098	< 0.1	< 0.1

Abbreviations:

- I = The location yielded insufficient quantity of water to collect a sample
- J = Analyte was positively identified/Associated value is an estimate below reporting limit
- = Parameter not analyzed
- < = Not detected above the reported sample detection limit

TABLE 3
THIRD QUARTER AUGUST 2015
GROUNDWATER MONITORING RESULTS

Landfill 1 Area Monitoring Well Locations								
Parameters	B-326-O2	B-326-O3	MW-402-O1	(DUP-1) MW-402-O1	MW-501-O1	MW-512-O1	MW-513-O1	(FB-2) Field Blank
	08/05/15	08/05/15	08/04/15	08/04/15	08/05/15	08/05/15	08/05/15	08/05/15
Mercury (mg/L)	0.01247	0.0813	0.0066	0.00684	0.4577	0.0155	0.0142	< 0.0002
Chloride (mg/L)	230	110	660	670	NA	110	360	0.086 J
Specific Conductance (µS/cm @25°C)	1,087	705	3,087	--	1,484	612	1,337	--
pH (Standard Units)	7.17	6.82	7.35	--	6.83	6.74	7.23	--
Temperature (Degrees Celcius)	10.4	10.5	10.4	--	14.4	8.7	8.9	--
Salinity (g/L)	0.56	0.35	1.66	--	0.77	0.31	0.69	--
Turbidity (field) (NTU)	1	0.3	1	--	1.5	1	0.8	--
Dissolved Oxygen (mg/L)	5	9	10.6	--	4.4	8.29	7.08	--
VOCs								
Acetone (µg/L)	NA	NA	NA	NA	< 5	NA	NA	NA
Methylene Chloride (µg/L)	NA	NA	NA	NA	< 5	NA	NA	NA
Chloroform (µg/L)	NA	NA	NA	NA	2.3	NA	NA	NA
Carbon Tetrachloride (µg/L)	NA	NA	NA	NA	1.33	NA	NA	NA
Benzene (µg/L)	NA	NA	NA	NA	< 1	NA	NA	NA
Toluene (µg/L)	NA	NA	NA	NA	< 1	NA	NA	NA
Ethylbenzene (µg/L)	NA	NA	NA	NA	< 1	NA	NA	NA
Carbon Disulfide (µg/L)	NA	NA	NA	NA	< 1	NA	NA	NA
o-Xylene (µg/L)	NA	NA	NA	NA	< 1	NA	NA	NA
m,p-Xylene (µg/L)	NA	NA	NA	NA	< 2	NA	NA	NA
Methyltertiarybutylether (µg/L)	NA	NA	NA	NA	< 1	NA	NA	NA
Trichloroethene (µg/L)	NA	NA	NA	NA	3	NA	NA	NA
Naphthalene (µg/L)	NA	NA	NA	NA	< 2	NA	NA	NA
1,1-Dichloroethene (µg/L)	NA	NA	NA	NA	< 1	NA	NA	NA
Dibromochloromethane (µg/L)	NA	NA	NA	NA	< 1	NA	NA	NA
Tetrachloroethene (µg/L)	NA	NA	NA	NA	< 1	NA	NA	NA
Bromodichloromethane (µg/L)	NA	NA	NA	NA	< 1	NA	NA	NA
Bromoform (µg/L)	NA	NA	NA	NA	< 1	NA	NA	NA
1,1,1-Trichloroethane (µg/L)	NA	NA	NA	NA	< 1	NA	NA	NA
1,1,2-Trichloroethane (µg/L)	NA	NA	NA	NA	< 1	NA	NA	NA
cis-1,2-Dichloroethene (µg/L)	NA	NA	NA	NA	< 1	NA	NA	NA
Chloroethane (µg/L)	NA	NA	NA	NA	< 2	NA	NA	NA
Chloromethane (µg/L)	NA	NA	NA	NA	< 2	NA	NA	NA
Bromomethane (µg/L)	NA	NA	NA	NA	< 2	NA	NA	NA
Dichlorodifluoromethane (µg/L)	NA	NA	NA	NA	0.42 J	NA	NA	NA
Chloropicrin (µg/L)	NA	NA	NA	NA	< 0.111	NA	NA	NA

Abbreviations:

J = Analyte was positively identified/Associated value is an estimate below reporting limit

NA = Parameter is not included in routine quarterly monitoring

-- = Parameter not analyzed

< = Not detected above the reported sample detection limit

TABLE 4
THIRD QUARTER AUGUST 2015
GROUNDWATER MONITORING RESULTS

Landfills 3 & 4 Monitoring Well Locations							
Parameters	P-2A	(DUP-5) P-2A	P-13	B-309-B1	MW-410-B1	MW-506-B1	
	08/05/15	08/05/15	08/04/15	08/04/15	08/04/15	08/04/15	08/13/15
Mercury (mg/L)	0.00193	0.00195	< 0.0002	< 0.0002	0.00227	0.07077	--
Specific Conductance (µS/cm @25°C)	869	--	333	569	739	1,767	2,113
pH (Standard Units)	6.77	--	7.4	7.97	7.14	6.61	6.54
Temperature (Degrees Celcius)	12.3	--	10.7	14.4	13.4	13.9	13.8
Salinity (g/L)	0.44	--	0.17	0.28	0.37	0.92	1.11
Turbidity (field) (NTU)	0.2	--	0.6	0.9	0.3	1.1	0.2
Dissolved Oxygen (mg/L)	4	--	9	1.4	4.8	3.2	2.9
VOCs							
Acetone (µg/L)	< 5	< 5	< 5	< 5	< 5	5 UJ	--
Methylene Chloride (µg/L)	< 5	< 5	< 5	< 5	< 5	5 UJ	--
Chloroform (µg/L)	8.7	9.4	< 1	0.72 J	12	4.7 J	--
Carbon Tetrachloride (µg/L)	11	8.97	1.68	1.87	18.7	--	9.71
Benzene (µg/L)	< 1	< 1	< 1	< 1	< 1	1 UJ	--
Toluene (µg/L)	< 1	< 1	< 1	< 1	< 1	1 UJ	--
Ethylbenzene (µg/L)	< 1	< 1	< 1	< 1	< 1	1 UJ	--
Carbon Disulfide (µg/L)	< 1	< 1	< 1	< 1	< 1	1 UJ	--
o-Xylene (µg/L)	< 1	< 1	< 1	< 1	< 1	1 UJ	--
m,p-Xylene (µg/L)	< 2	< 2	< 2	< 2	< 2	2 UJ	--
Methyltertiarybutylether (µg/L)	< 1	< 1	< 1	< 1	< 1	1 UJ	--
Trichloroethene (µg/L)	< 1	< 1	< 1	< 1	0.33 J	0.66 J	--
Naphthalene (µg/L)	< 2	< 2	< 2	< 2	< 2	< 2	--
1,1-Dichloroethene (µg/L)	< 1	< 1	< 1	< 1	< 1	1 UJ	--
Dibromochloromethane (µg/L)	< 1	< 1	< 1	< 1	< 1	1 UJ	--
Tetrachloroethene (µg/L)	< 1	< 1	< 1	< 1	< 1	1 UJ	--
Bromodichloromethane (µg/L)	< 1	< 1	< 1	< 1	< 1	1 UJ	--
Bromoform (µg/L)	< 1	< 1	< 1	< 1	< 1	1 UJ	--
1,1,1-Trichloroethane (µg/L)	< 1	< 1	< 1	< 1	< 1	1 UJ	--
1,1,2-Trichloroethane (µg/L)	< 1	< 1	< 1	< 1	< 1	1 UJ	--
cis-1,2-Dichloroethene (µg/L)	< 1	< 1	< 1	< 1	< 1	1 UJ	--
Chloroethane (µg/L)	< 2	< 2	< 2	< 2	< 2	2 UJ	--
Chloromethane (µg/L)	< 2	< 2	< 2	< 2	< 2	2 UJ	--
Bromomethane (µg/L)	< 2	< 2	< 2	< 2	< 2	2 UJ	--
Dichlorodifluoromethane (µg/L)	< 2	< 2	< 2	< 2	< 2	< 2	--
Chloropicrin (µg/L)	NA	NA	NA	NA	NA	NA	NA

Abbreviations:

J = Analyte was positively identified/Associated value is an estimate below reporting limit

UJ = Material was not detected/Associated value is an estimate

NA = Parameter is not included in routine quarterly monitoring

-- = Parameter not analyzed

< = Not detected above the reported sample detection limit

**TABLE 5
THIRD QUARTER AUGUST 2015
GROUNDWATER MONITORING RESULTS**

Landfill 5 Monitoring Well Locations															
Parameters	B-303-B1	B-303-B2	B-303-B2	B-303-B3	B-303-O1	B-304-B1	B-304-O1	B-306-B1	B-306-B2	B-306-B3	B-307-B1	B-307-B2	(DUP-3) B-307-B2	B-307-O1	(FB-3) Field Blank
	08/06/15	08/06/15	08/13/15	08/06/15	08/06/15	08/06/15	08/06/15	08/06/15	08/06/15	08/06/15	08/06/15	08/07/15	08/07/15	08/07/15	08/07/15
Mercury (mg/L)	< 0.0002	< 0.0002	--	< 0.0002	I	< 0.0002	I	< 0.0002	< 0.0002	D	< 0.0002	< 0.0002	< 0.0002	D	< 0.0002
Chloride (mg/L)	NA	NA	NA	NA	NA	48	I	NA	NA	D	2.7	2.6	2.5	D	< 0.5
Sulfate (mg/L)	NA	NA	NA	NA	NA	22.6	I	NA	NA	D	31.6	15.4	15.2	D	0.071 J
Total Organic Carbon (mg/L) ¹	NA	NA	NA	NA	NA	0.57	I	NA	NA	D	0.59 J	0.7 J	0.56 J	D	< 0.23 J
Total Recoverable Phenolics (ug/L)	NA	NA	NA	NA	NA	25 J	I	NA	NA	D	< 30	< 30	< 30	D	< 30
Total Organic Halides (mg/L) ¹	NA	NA	NA	NA	NA	0.1 U	I	NA	NA	D	0.1 U	0.1 U	0.1 U	D	0.07 J
Specific Conductance (µS/cm @25°C)	150	159	182	147	D	547	I	1,971	1,843	D	260	200	--	D	--
pH (Standard Units)	7.64	7.89	7.75	7.38	D	7.3	I	8.17	7.18	D	8.48	8.58	--	D	--
Temperature (Degrees Celcius)	9.8	10.2	12.8	10.6	D	12.2	I	14.4	13.9	D	10.3	10.5	--	D	--
Salinity (g/L)	0.08	0.08	0.09	0.08	D	0.27	I	1.03	0.96	D	0.13	0.1	--	D	--
Turbidity (field) (NTU)	0.7	< 0.05	0.1	0.1	D	0.01	I	1.7	1	D	1.1	0.8	--	D	--
Dissolved Oxygen (mg/L)	10.1	10.3	8.4	9.6	D	0.4	I	3.3	2.5	D	0.9	5	--	D	--
Iron (mg/L)	NA	NA	NA	NA	NA	0.0802	I	NA	NA	D	0.055	0.044 J	0.04 J	D	0.034 J
Manganese (mg/L)	NA	NA	NA	NA	NA	0.0442	I	NA	NA	D	0.0028	0.0012	0.0009 J	D	0.0011
Sodium (mg/L)	NA	NA	NA	NA	NA	89.1	I	NA	NA	D	18.3	5.83	6	D	0.051 J
VOCs															
Acetone (µg/L) ²	2.7 J	3.5 J	--	2.8 J		NA	NA	< 5	< 5	NA	NA	NA	NA	NA	5.7
Methylene Chloride (µg/L) ²	< 5	< 5	--	< 5	I	NA	NA	< 5	< 5	NA	NA	NA	NA	NA	1.5 J
Chloroform (µg/L)	< 1	< 1	--	< 1	I	NA	NA	1.3	1.4	NA	NA	NA	NA	NA	< 1
Carbon Tetrachloride (µg/L)	< 0.1	--	< 0.102	< 0.101	I	NA	NA	1.26	1.42	NA	NA	NA	NA	NA	< 0.102
Benzene (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	< 1
Toluene (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	0.3 J
Ethylbenzene (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	< 1
Carbon Disulfide (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	< 1
o-Xylene (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	< 1
m,p-Xylene (µg/L)	< 2	< 2	--	< 2	I	NA	NA	< 2	< 2	NA	NA	NA	NA	NA	< 2
Methyltertiarybutylether (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	< 1
Trichloroethene (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	< 1
Naphthalene (µg/L)	< 2	< 2	--	< 2	I	NA	NA	< 2	< 2	NA	NA	NA	NA	NA	< 1
1,1-Dichloroethene (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	< 1
Dibromochloromethane (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	< 1
Tetrachloroethene (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	< 1
Bromodichloromethane (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	< 1
Bromoform (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	< 1
1,1,1-Trichloroethane (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	< 1
1,1,2-Trichloroethane (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	< 1
cis-1,2-Dichloroethene (µg/L)	< 1	< 1	--	< 1	I	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	< 1
Chloroethane (µg/L)	< 2	< 2	--	< 2	I	NA	NA	< 2	< 2	NA	NA	NA	NA	NA	< 2
Chloromethane (µg/L)	2 UJ	2 UJ	--	2 UJ	I	NA	NA	2 UJ	2 UJ	NA	NA	NA	NA	NA	2 UJ
Bromomethane (µg/L)	< 2	< 2	--	< 2	I	NA	NA	< 2	< 2	NA	NA	NA	NA	NA	< 2
Dichlorodifluoromethane (µg/L)	< 2	< 2	--	< 2	I	NA	NA	< 2	< 2	NA	NA	NA	NA	NA	< 2
Chloropicrin (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abbreviations:

- D = Sampling location was dry
- I = The sampling location yielded insufficient quantity to collect a sample.
- J = Analyte was positively identified/Associated value is an estimate below reporting limit.
- U = Qualified as not detected at the reporting limit due to presence of trace analyte concentrations in the associated field blank
- UJ = Analyte was not detected/Associated value is an estimate .
- NA = Parameter is not included in routine quarterly monitoring
- = Parameter not analyzed
- < = Not detected above the reported sample detection limit

Notes:

1. Value for total organic carbon and total organic halides is the average of four replicates.
2. Acetone and methylene chloride are common laboratory contaminants and their presence in samples is considered potentially suspect.

**TABLE 6
THIRD QUARTER AUGUST 2015
GROUNDWATER MONITORING RESULTS**

Landfill 5 Monitoring Well Locations								
Parameters	B-304-B1	B-304-O1	B-306-B3	B-307-B1	B-307-B2	(DUP-3) B-307-B2	B-307-O1	(FB-3) Field Blank
	08/06/15	08/06/15	08/06/15	08/06/15	08/07/15	08/07/15	08/07/15	08/07/15
Total Organic Halides - 1 (mg/L)	0.154	I	D	0.1 U	0.1 U	0.1 U	D	0.065 J
Total Organic Halides - 2 (mg/L)	0.112	I	D	0.1 U	0.1 U	0.1 U	D	0.053 J
Total Organic Halides - 3 (mg/L)	0.1 U	I	D	0.1 U	0.1 U	0.1 U	D	0.086 J
Total Organic Halides - 4 (mg/L)	0.1 U	I	D	0.1 U	0.1 U	0.1 U	D	0.066 J
Total Organic Carbon - 1 (mg/L)	0.54	I	D	0.58 J	0.57 J	0.50 J	D	< 1
Total Organic Carbon - 2 (mg/L)	0.55	I	D	0.60 J	0.99 J	0.55 J	D	0.24 J
Total Organic Carbon - 3 (mg/L)	0.62	I	D	0.55 J	0.58 J	0.52 J	D	< 1
Total Organic Carbon - 4 (mg/L)	0.55	I	D	0.61 J	0.66 J	0.66 J	D	< 1

Abbreviations:

D = Sampling location was dry

I = The location yielded insufficient quantity of water to collect a sample.

J = Analyte was positively identified/Associated value is an estimate below reporting limit.

U = Qualified as not detected at the reporting limit due to presence of trace analyte concentrations in the associated field blank

< = Not detected above the reported sample detection limit

**TABLE 7
THIRD QUARTER AUGUST 2015
GROUNDWATER MONITORING RESULTS**

Groundwater Treatment Plant	
Parameters	IEW Influent ¹
	08/04/15
Mercury (mg/L)	0.04246
Chloride (mg/L)	220
Sulfate (mg/L)	23.6
Alkalinity (mg/L as CaCO₃)	143
Specific Conductance (µS/cm @25°C)	1,045
pH (Standard Units)	7.44
Temperature (Degrees Celcius)	13.4
Salinity (g/L)	0.53
Turbidity (field) (NTU)	0.6
Dissolved Oxygen (mg/L)	6.8
Iron (mg/L)	0.05 U
Manganese (mg/L)	0.0374
Sodium (mg/L)	132
VOCs	
Acetone (µg/L)	< 5
Methylene Chloride (µg/L)	< 5
Chloroform (µg/L)	4.7
Carbon Tetrachloride (µg/L)	< 4.9
Benzene (µg/L)	< 1
Toluene (µg/L)	< 1
Ethylbenzene (µg/L)	< 1
Carbon Disulfide (µg/L)	0.83 J
o-Xylene (µg/L)	< 1
m,p-Xylene (µg/L)	< 2
Methyltertiarybutylether (µg/L)	< 1
Trichloroethene (µg/L)	1.4
Naphthalene (µg/L)	< 1
1,1-Dichloroethene (µg/L)	0.45 J
Dibromochloromethane (µg/L)	< 1
Tetrachloroethene (µg/L)	0.64 J
Bromodichloromethane (µg/L)	< 1
Bromoform (µg/L)	< 1
1,1,1-Trichloroethane (µg/L)	< 1
1,1,2-Trichloroethane (µg/L)	< 1
cis-1,2-Dichloroethene (µg/L)	< 1
Chloroethane (µg/L)	< 2
Chloromethane (µg/L)	58
Bromomethane (µg/L)	< 2
Dichlorodifluoromethane (µg/L)	< 2
Chloropicrin (µg/L)	2,430

Note:

- Influent represents combined flow from the five Landfill 1 Area Interim Extraction Wells (IEWs)

Abbreviations:

- J = Analyte was positively identified/Associated value is an estimate below reporting limit
- U = Qualified as not detected at the reporting limit due to presence of analyte in the the associated method blank
- < = Not detected above the reported sample detection limit.

TABLE 8
THIRD QUARTER AUGUST 2015
GROUNDWATER MONITORING RESULTS

Trip Blanks						
Parameters	QCBT(4J1)	QCBT(4J3)	QCBT(4J5)	QCBT(4G5)	QCBT(HD7)	QCBT(4J6)
	08/04/15	08/04/15	08/05/15	08/06/15	08/06/15	08/06/15
VOCs						
Acetone (µg/L)	3.8 J	--	--	< 5	--	--
Methylene Chloride (µg/L)	2.1 J	--	--	2.6 J	--	--
Chloroform (µg/L)	< 1	--	--	< 1	--	--
Carbon Tetrachloride (µg/L)	< 0.109	< 0.102	< 0.114	--	< 0.104	< 0.101
Benzene (µg/L)	< 1	--	--	< 1	--	--
Toluene (µg/L)	< 1	--	--	< 1	--	--
Ethylbenzene (µg/L)	< 1	--	--	< 1	--	--
Carbon Disulfide (µg/L)	< 1	--	--	< 1	--	--
o-Xylene (µg/L)	< 1	--	--	< 1	--	--
m,p-Xylene (µg/L)	< 2	--	--	< 2	--	--
Methyltertiarybutylether (µg/L)	< 1	--	--	< 1	--	--
Trichloroethene (µg/L)	< 1	--	--	< 1	--	--
Naphthalene (µg/L)	< 1	--	--	< 1	--	--
1,1-Dichloroethene (µg/L)	< 1	--	--	< 1	--	--
Dibromochloromethane (µg/L)	< 1	--	--	< 1	--	--
Tetrachloroethene (µg/L)	< 1	--	--	< 1	--	--
Bromodichloromethane (µg/L)	< 1	--	--	< 1	--	--
U = Qualified as not detected at the report	< 1	--	--	< 1	--	--
1,1,1-Trichloroethane (µg/L)	< 1	--	--	< 1	--	--
1,1,2-Trichloroethane (µg/L)	< 1	--	--	< 1	--	--
cis-1,2-Dichloroethene (µg/L)	< 1	--	--	< 1	--	--
Chloroethane (µg/L)	< 2	--	--	< 2	--	--
Chloromethane (µg/L)	< 2	--	--	< 2	--	--
Bromomethane (µg/L)	< 2	--	--	< 2	--	--
Dichlorodifluoromethane (µg/L)	< 2	--	--	< 2	--	--
Chlorpicrin (µg/L)	< 0.109	< 0.102	< 0.114	--	< 0.104	< 0.101

Abbreviations:

J = Analyte was positively identified/Associated value is an estimate below reporting limit.

-- = Parameter not analyzed

< = Not detected above the reported sample detection limit