

August 24, 2016

Mr. Chris Swain
Bureau of Remediation and Waste Management
Maine Department of Environmental Protection
17 State House Station
Augusta ME 04333

**Subject: Second Quarter 2016 Groundwater Monitoring Results
 Orrington Remediation Site
 Orrington, Maine**

Dear Mr. Swain:

Enclosed for your information is a report of the **second quarter 2016** 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 are being submitted to Maine DEP separately as stated in the attached report.

The third quarter 2016 groundwater monitoring event is scheduled to begin September 26, 2016. The Department will be notified at least two weeks before the event. 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

August 24, 2016

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

Subject: Second Quarter 2016 Groundwater Monitoring Report
Orrington Remediation Site, Orrington, Maine

Dear Ms. Zeigler:

Enclosed are the groundwater quality results from the June 2016 second quarter sampling event at the Orrington Remediation Site in Orrington, Maine (Site). Groundwater samples were obtained from 23 monitoring wells located within the southwestern portion of the Site (Ferry Road Area), the former Manufacturing Area, Landfill 1 Area, Landfill 3, Landfill 4, and Landfill 5. Monitoring well locations are shown on 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 Haseltine and Safian domestic wells on Ferry Road that are routinely analyzed as part of the quarterly sampling event. The water samples from the residential properties were obtained using methods consistent with the previous quarterly sampling events. Groundwater samples could not be obtained from two Site monitoring wells, B-303-O1 (Landfill 5) and MW-503-O1 (former Manufacturing Area), because of dry or insufficient water levels in the wells. An influent sample from the Landfill 1 Area groundwater interim extraction system (IES) was also obtained at the onsite water treatment plant for analysis.

Laboratory analyses for the June 2016 second quarter sampling round were provided by Alpha Analytical (Alpha) of Westborough, MA. Analytical results for parameters were quantified to the laboratory's method detection limit (MDL). Concentrations detected between the MDL and the laboratory's reporting limit (RL) were qualified by Alpha as estimated ("J") values. Electronic data deliverables (EDDs) and Alpha laboratory analytical reports from the June 2016 sampling round were submitted to MEDEP on July 22, 2016 and August 8, 2016. Groundwater quality results are summarized in attached Tables 1 through 7. SME field data

sheets completed at each well sampled are also included in the attachments to this transmittal.

QUALITY CONTROL REVIEW

Groundwater analytical results were reviewed to ensure that they were representative of the area sampled using guidelines in the U.S.EPA *National Functional Guidelines (NFG) for Superfund Organic Methods*,¹ U.S.EPA *National Functional Guidelines for Inorganic Superfund Data Review* ² and U.S.EPA *New England Environmental Data Review Supplement*.³ Laboratory method blanks for volatile organic compounds (VOCs), metals, and inorganics, laboratory control samples (LCS), matrix spikes (MS), matrix spike duplicates (MSD), laboratory duplicates, and VOC surrogate compound recoveries were evaluated. The sampling process and field and sample transport conditions were evaluated in laboratory-supplied trip blanks, and in field blanks. Sampling and analytical precision was evaluated in three duplicate groundwater sample pairs submitted for laboratory analysis. Relative percent differences (RPDs) in duplicate sample pairs were evaluated against the NFG for organic and inorganic parameters. The QC data reviewed in the analytical laboratory reports were of acceptable quality for the June 2016 second quarter sampling round.

Relevant QC findings are summarized for the Site areas sampled during routine quarterly groundwater monitoring.

Ferry Road Area

- A method blank for chloride contained a trace estimated concentration between the laboratory MDL and RL. The chloride detection was of no significance because of the historical presence of chloride in the associated groundwater samples at concentrations of about 4 orders of magnitude greater than the value reported in the method blank.
- A field duplicate pair from the Ferry Road Area was within the acceptance criterion for RPD.

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.

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

Manufacturing Area

- Two VOCs in the LCS/LCSDs were outside the laboratory's acceptance criteria for spiked recoveries; however, these parameters were not detected in the associated sample delivery group (SDG).
- Surrogate recoveries for VOC analysis were within the acceptance criteria.
- Detectable mercury in the field duplicate pair for MW-510-O1 exceeded the acceptable RPD criterion of 30 percent. The mercury concentrations in the samples were greater than 5 times the RL; therefore, the mercury results for the duplicate pair were qualified as estimated (J).

Landfill 1

- Three VOCs in the LCS/LCSDs were outside the laboratory's acceptance criteria for spiked recoveries and/or RPD; however, these parameters were not detected in the associated SDG.
- Surrogate recoveries for VOC analysis were within the acceptance criteria.
- A field blank contained a trace estimated concentration of chloride between the laboratory MDL and RL. The chloride detection was not considered significant because of the historical presence of chloride in the associated groundwater samples at concentrations 1,000 to 10,000 times greater than reported in the field blank.
- A field duplicate pair from Landfill 1 Area was within acceptance criterion for RPD.

Landfills 3 and 4

- Two VOCs in the LCS/LCSDs were outside the laboratory's acceptance criteria for spiked recoveries and/or RPD; however, these parameters were not detected in the associated SDG.
- Surrogate recoveries for VOC analysis within the acceptance criteria.

Landfill 5

- Carbon disulfide was detected in a trip blank at an estimated concentration between the laboratory MDL and RL. Detectable concentrations of carbon disulfide were not present in the associated groundwater samples; therefore, no qualification of sample results was necessary.
- Two VOCs in the LCS/LCSDs were outside the laboratory's acceptance criteria for spiked recoveries; however, these parameters were not detected in the associated SDG.

- Surrogate recoveries for VOC analysis within the acceptance criteria.

Treatment Plant Influent

- Two VOCs in the LCS/LCSDs were outside the laboratory's acceptance criteria for spiked recoveries; however, these parameters were not detected in the associated SDG.
- Spiked recoveries of iron in an MS/MSD were outside the laboratory's acceptance criteria. No qualification of the iron results was necessary because actions apply to the native sample only, and the native sample for the MS/MSD was not from the SDG.
- Surrogate recoveries for VOC analysis were within the acceptance criteria. Acceptance criteria for the surrogate recovery associated with the EPA 8011 analysis was not attained because of the dilution required to quantitate chloropicrin within the calibration range.

LABORATORY ANALYTICAL RESULTS

Eleven monitoring wells sampled in the second quarter June 2016 event contained detectable concentrations of mercury, a distribution that has been consistent under the current groundwater monitoring regime. Mercury concentrations in 8 of the 11 monitoring wells exceeded the Site's Media Protection Standard (MPS) for mercury (2 micrograms per liter [$\mu\text{g/L}$]), a number of wells also typical in the quarterly groundwater monitoring. Mercury concentrations greater than the MPS ranged from 2.57 $\mu\text{g/L}$ to 324 $\mu\text{g/L}$. In the remaining three wells with detectable mercury less than the MPS, the concentrations ranged from 0.45 $\mu\text{g/L}$ to 1.21 $\mu\text{g/L}$. Mercury concentrations above the MPS decreased in 6 of the 8 monitoring wells between the first quarter March 2016 and the second quarter June 2016. In addition, the average mercury concentration through the first two quarters of 2016 has decreased in 10 of the 11 wells monitored compared to 2015 values.

Of the wells sampled at the Site for quarterly monitoring, higher detectable mercury concentrations are associated with the Landfill 1 Area. Monitoring well MW-501-O1, located near the Lined Process Lagoon, has had the highest concentration of mercury over the last several years of monitoring. The mercury concentration in the second quarter round at MW-501-O1 (324 $\mu\text{g/L}$) increased from the value in the first quarter (March 2016), but was less than the average concentration for the 2015 monitoring year. Along the downgradient margin of the Landfill 1 Area, higher mercury concentrations are typically associated with monitoring wells B-326-O2 and/or B-326-O3, which had mercury detections of 5.81 $\mu\text{g/L}$ and 71.8 $\mu\text{g/L}$, respectively. However, the average mercury concentration in both B-326-O2 and B-326-O3 through the first two quarters of 2016 is the lowest value compared to previous annual averages since SME monitoring was initiated in September of 2010. The same

observation applies to MW-512-O1, which is also averaging less mercury in 2016 than in the previous years of monitoring. Landfill 1 Area IES wells EW-1 and MW-601 have captured groundwater with concentrations of mercury similar to concentrations detected in B-326-03, which has been observed in previous rounds of sampling (documented in quarterly operation summary reports for the IES).

The mercury concentration detected in MW-510-O1 (2.57 µg/L), located in the former Manufacturing Area just downgradient from the former salt storage pad, exceeded the MPS of 2 µg/L. The concentration of mercury in MW-510-O1 during the second quarter was essentially the same value as the first quarter March 2016 sampling round. The average mercury concentration in MW-510-O1 during the two quarterly sampling rounds in 2016 was lower than last year's average. A less-than-MPS concentration of mercury was detected in MW-502-O1 (0.45 µg/L). Mercury has not exceeded the MPS in MW-502-O1 since June 2010, and the concentration has been gradually decreasing over time. A representative groundwater sample could not be obtained from MW-503-O1 during the second quarter June 2016 sampling round because of a lack of water in the well. However, the water quality record over more than five years of monitoring indicated mercury concentrations typically less than the MPS in MW-503-O1.

Landfills 3, 4, and 5 occupy a portion of the ridge area north of the former Manufacturing Area. Nine monitoring wells in the ridge area were sampled during the second quarter June 2016 round. Mercury was detected in one well, MW-506-B1 (6.4 µg/L) installed beneath Landfill 4, at a concentration exceeding the MPS. Total mercury concentrations have been greater than the MPS in MW-506-B1 over the historical record of sampling. However, the 2016 monitoring through two quarters indicated the average mercury concentration in MW-506-B1 has decreased by about 80 percent compared to 2015. Mercury detections less than the MPS were present in groundwater samples downgradient moving south-southwesterly from Landfill 3 and Landfill 4 in monitoring wells MW-410-B1 (0.75 µg/L) and P-2A (1.2 µg/L). The average mercury concentration in MW-410-B1 and P-2A through two quarters of 2016 is also less than average yearly mercury values calculated in 4 of the last 5 years of monitoring. Detectable mercury was not present in the northerly flowing groundwater downgradient of Landfill 3 that is monitored in well P-13. Trace mercury levels less than the laboratory RL have been infrequently detected in P-13 and the MPS not exceeded since 2010.

Mercury was not detected in the five Landfill 5 monitoring wells sampled during the second quarter of 2016. The six monitoring wells sampled in the southwestern portion of the Site between the former Manufacturing Area and Ferry Road, and the two residential wells sampled on Ferry Road did not contain detectable concentrations of mercury, which is consistent with previous water quality at these locations.

Chloropicrin is routinely analyzed in groundwater obtained from former Manufacturing Area monitoring wells MW-502-O1 and MW-510-O1, and in MW-501-O1 near the Lined Process Lagoon in the Landfill 1 Area. Detections of chloropicrin were limited to MW-510-O1 (1.98 µg/L) and its duplicate (2.25 µg/L), concentrations that were less than the MPS of 30 µg/L. Since 2011, chloropicrin has been sporadically detected in MW-510-O1 at less than the MPS, and rarely in MW-501-O1 and MW-502-O1.

VOCs were analyzed in groundwater samples obtained from monitoring wells in the former Manufacturing Area and around Landfills 3, 4, and 5 during quarterly sampling rounds. In addition to chloropicrin, seven other VOCs were detected in the second quarter June 2016 sampling round, which were distributed among eight wells at the Site. Carbon tetrachloride was the only VOC detected in the routine quarterly sampling that exceeded an MPS (3 µg/L), which occurred in monitoring wells MW-410-B1 (43 µg/L), P-2A (9.3 µg/L) and MW-506-B1 (9.3 µg/L) associated with Landfills 3 and 4. The carbon tetrachloride detections in these three wells are consistent with previous quarterly sampling rounds. Detections of carbon tetrachloride at concentrations less than the MPS were associated with three other Site wells. Chloroform was detected in eight monitoring wells at concentrations less than the MPS (57 µg/L), which is consistent with the quarterly sampling. Trichloroethene, tetrachloroethene, 1,1-dichloroethene, cis-1,2-dichloroethene and dichlorodifluoromethane were detected in four or fewer monitoring wells.

An influent water sample from the combined flow from the Landfill 1 Area IES wells (MW-601, EW-1, EW-2, EW-3, and EW-4) was obtained at the Site treatment plant and submitted to the laboratory for analysis of a suite of parameters. Analytical results for the influent sample are summarized in Table 6. Mercury, VOCs, and chloropicrin concentrations in the influent sample were comparable with the historical ranges for these groundwater quality parameters detected in the Landfill 1 Area and in recent influent testing.

GROUNDWATER QUALITY SUMMARY

A comparison of the June 2016 second quarter sample results to the Site MPS for mercury and VOCs indicated the following groundwater quality:

- Landfill 1 Area – The MPS for mercury (2 µg/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 (4.24 to 324 µg/L).
- Former Manufacturing Area – Mercury was detected in MW-510-O1 (2.57 µg/L) and its duplicate (3.86 µg/L) at a concentration greater than the MPS and

similar to the March 2016 first quarter round. VOC detections, including chloropicrin, did not exceed the MPS.

- Landfills 3 and 4 – No mercury was detected on the landfill ridge in P-13 to the north of Landfill 3. The mercury concentration in the groundwater at Landfill 4 in MW-506-B1 (6.4 µg/L) exceeded the MPS. Detectable mercury in MW-410-B1 (0.75 µg/L) and P-2A (1.21 µg/L) downgradient of Landfills 3 and 4 was less than the MPS. Carbon tetrachloride was detected in concentrations greater than the MPS of 3 µg/L in MW-506-B1 (9.3 µg/L), MW-410-B1 (43 µg/L), and P-2A (9.3 µg/L). These results are consistent with previous quarterly sampling rounds at the Site.
- Landfill 5 – Detectable mercury was not present in groundwater sampled from the Landfill 5 monitoring wells. The concentration of VOCs detected (chloroform) were significantly less than the MPS.
- Ferry Road Area and Residential Wells – Mercury was not detected in the southwestern part of the Site or in the two domestic wells sampled on Ferry Road, consistent with results from more than 5 years of routine quarterly monitoring.

WATER LEVEL MONITORING

Overall, the majority of wells sampled for routine quarterly monitoring exhibited lower groundwater elevations during the June 2016 sampling round than in March 2016. Water levels where a greater magnitude of decrease occurred were associated with the landfill ridge area. Most of these wells are screened in bedrock, and the groundwater elevations were lowered from 0.8 feet to 6.65 feet between the March and June quarterly sampling rounds. In the Site's lower topography, wells monitored in the former Manufacturing Area and Landfill 1 Area are screened in the soil, whereas the Ferry Road wells are drilled into the bedrock. Half of the monitoring wells in the lower topography exhibited decreasing groundwater levels and the other half increasing groundwater levels. Water levels in a majority of the wells monitored in former Manufacturing Area decreased by about 0.5 feet. However, groundwater levels in the Landfill 1 Area are affected by the daily tide-induced fluctuation in the Penobscot River, and therefore are not static. Instead, an average groundwater elevation determined for the Landfill 1 Area wells was calculated from pressure transducers in the wells sampled, or nearby piezometers with pressure transducers. Using the daily average groundwater elevation, the Landfill 1 Area wells were about 0.7 feet higher in June compared to the March 2016 sampling round.

Water level differences between the March and June 2016 quarterly sampling rounds in the Ferry Road Area wells were variable; i.e., groundwater elevations in the wells monitored on the north side of the Southerly Stream had increased by more than 4 feet, while they decreased by about 1 foot in the wells on the south side of the Southerly Stream. Previous site investigations in the 1990s identified tidally-induced fluctuations in most of the Ferry Road Area wells that are sampled in routine quarterly monitoring. The higher groundwater level elevations were associated with wells that were sampled when approaching the high tide phase, while those sampled near the low tide cycle had decreasing groundwater levels compared to the March 2016 monitoring.

Data from the Orrington Remediation Site weather station indicated below normal precipitation for the months of April, May, and June 2016. A total of about 8 inches of rainfall was recorded at the Site in the period between the first and second quarter 2016 sampling round. In contrast, the 3-month interval prior to the first quarter March 2016 sampling round experienced above normal precipitation and about 15 inches of precipitation. The lower rainfall total preceding the second quarter June 2016 was reflected in the decreasing groundwater levels measured in the majority of the monitoring wells not influenced by the Penobscot River tides. This is a typical pattern associated with a temperate climate setting where seasonal variations of precipitation, evapotranspiration, and temperature affect the amount of recharge to groundwater.

A comparison of the second quarter June 2016 groundwater levels to those measured in June 2015 revealed mostly lower water levels in the June 2016 sampling round. Excluding the wells affected by the river tides, groundwater levels in the Site wells monitored averaged about 2.5 feet lower groundwater elevations in June 2016 compared to June 2015. Reviewing weather data from the Site weather station and other sources for the 12 months preceding the June second quarter 2015 and 2016 sampling rounds indicated: (1) a normal amount of rainfall (42 inches) and about 17 weeks of abnormally dry weather (ending at the end of September 2015) before the June 2016 sampling quarter, and (2) less rainfall (34 inches) and less dry conditions (9 weeks) prior to the June 2015 sampling round (U.S. Drought Monitor)⁴. However, a more extreme difference occurred in the amount of snowfall at the Site in the winter season before each of the two sampling rounds. Approximately 39 inches of snowfall was recorded at the nearby Bangor International Airport in the winter season ending in March 2016 (NOAA National Climatic Data Center).⁵ In the winter season ending in March of 2015, about 120 inches of snowfall was recorded at the airport. The

⁴ U.S. Drought Monitor. <http://droughtmonitor.unl.edu> (accessed July 22, 2016).

⁵ Record of Climatological Observations, Bangor International Airport, ME. National Climatic Data Center Federal Building, Asheville, North Carolina, <http://www.ncdc.noaa.gov> (accessed August 3, 2016).

almost seven feet of additional snowfall in 2015 likely contributed more recharge to the groundwater in the months before the June 2015 sampling round than what was available in 2016. The recharge contribution from snowmelt would be reflected in higher groundwater levels in the monitoring wells at the Site during June 2015.

SCHEDULE FOR FUTURE MONITORING

The third quarter 2016 groundwater sampling event at the Orrington Remediation Site is scheduled to start on September 26, 2016. In addition to the routine monitoring, groundwater samples will also be obtained from the five interim groundwater extraction wells that are operating in the Landfill 1 Area. MEDEP will be notified in advance of the sampling schedule. If you have any questions concerning the June 2016 groundwater quality results, please do not hesitate to contact Bill Metzger or me.

Very truly yours,

SEVEE & MAHER ENGINEERS, INC.



for John Sevee

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



Attachments:

- Figure 1 – Well Locations
- Groundwater Monitoring Results Summary - Tables 1 through 7
- Data Tables
- Relative Percent Difference for Duplicate Samples
- Field Data Sheets

FIGURE 1 – WELL LOCATIONS

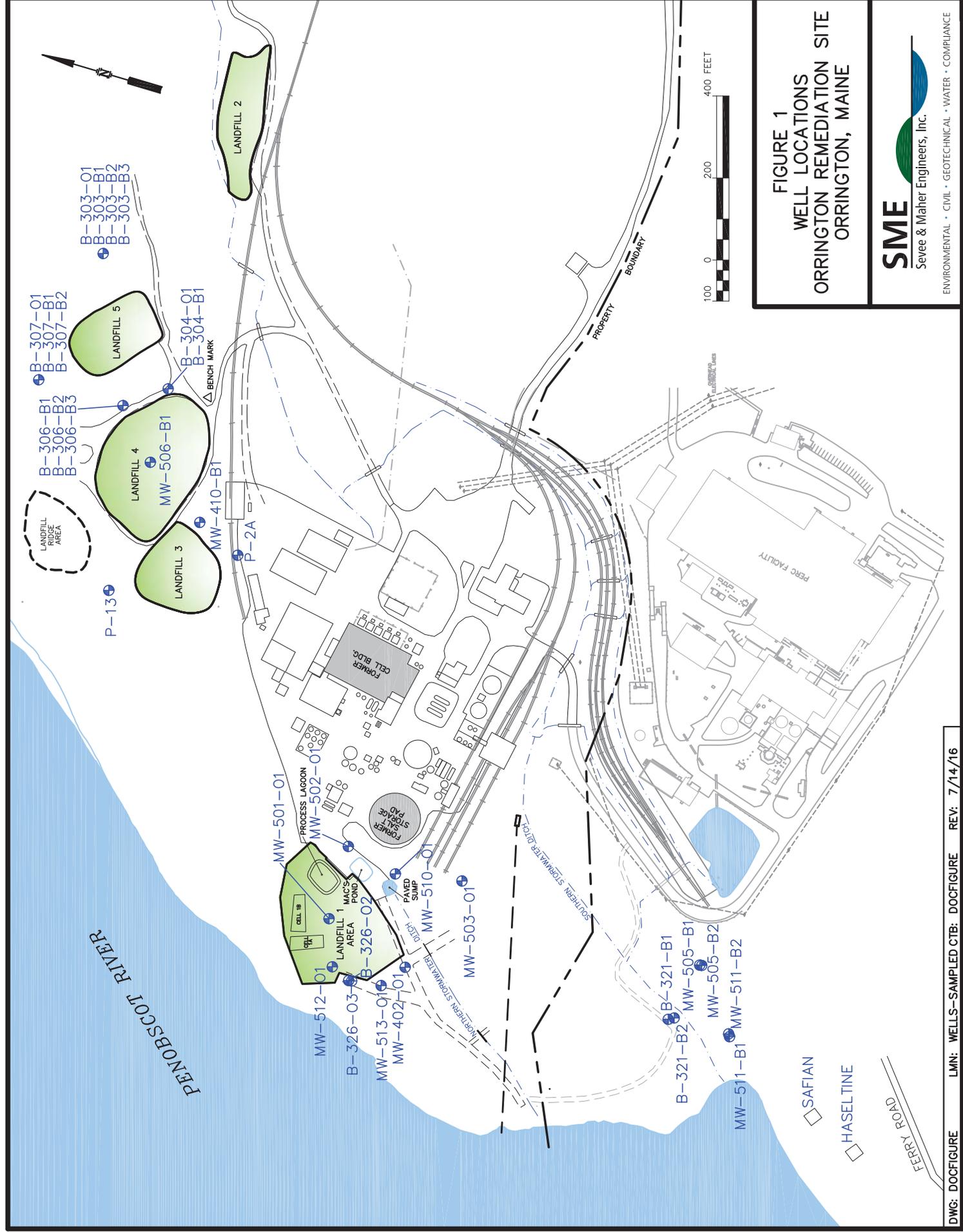


FIGURE 1
WELL LOCATIONS
ORRINGTON REMEDIATION SITE
ORRINGTON, MAINE

SME
 Sevee & Maher Engineers, Inc.

ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

**GROUNDWATER MONITORING RESULTS SUMMARY –
TABLES 1 THROUGH 7**

TABLE 2
SECOND QUARTER JUNE 2016
GROUNDWATER MONITORING RESULTS

Parameters	Former Manufacturing Area Monitoring Well Locations				(FB-1) Field Blank
	MW-502-O1	MW-503-O1	MW-510-O1	(DUP-4) MW-510-O1	
Mercury (mg/L)	06/08/16 0.00045	06/06/16 I	06/08/16 0.00257 J	06/08/16 0.00386 J	06/08/16 < 0.0002
Specific Conductance (µS/cm @25°C)	1,630	I	79,432	NA	NA
pH (Standard Units)	7.6	I	7.13	NA	NA
Temperature (Degrees Celcius)	12.2	I	14.6	NA	NA
Salinity (g/L)	0.85	I	57.46	NA	NA
Turbidity (field) (NTU)	0.2	I	1.1	NA	NA
Dissolved Oxygen (mg/L)	5.3	I	0.2	NA	NA
VOCs					
Acetone (µg/L)	< 5	I	< 5	< 5	< 5
Chloroform (µg/L)	2	I	6.8	6.5	< 0.75
Carbon Tetrachloride (µg/L)	< 0.106	I	0.185	0.24	< 0.11
Benzene (µg/L)	< 0.5	I	< 0.5	< 0.5	< 0.5
Toluene (µg/L)	< 0.75	I	< 0.75	< 0.75	< 0.75
Ethylbenzene (µg/L)	< 0.5	I	< 0.5	< 0.5	< 0.5
Carbon Disulfide (µg/L)	< 1	I	< 1	< 1	< 1
o-Xylene (µg/L)	< 1	I	< 1	< 1	< 1
m,p-Xylene (µg/L)	< 1	I	< 1	< 1	< 1
Methyltertiarybutylether (µg/L)	< 1	I	< 1	< 1	< 1
Trichloroethene (µg/L)	< 0.5	I	0.26 J	0.2 J	< 0.5
1,1-Dichloroethene (µg/L)	< 0.5	I	0.33 J	< 0.5	< 0.5
Dibromochloromethane (µg/L)	< 0.5	I	< 0.5	< 0.5	< 0.5
Tetrachloroethene (µg/L)	< 0.5	I	< 0.5	< 0.5	< 0.5
Bromodichloromethane (µg/L)	< 0.5	I	< 0.5	< 0.5	< 0.5
Bromoform (µg/L)	< 1	I	< 1	< 1	< 1
1,1,1-Trichloroethane (µg/L)	< 0.5	I	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane (µg/L)	< 0.75	I	< 0.75	< 0.75	< 0.75
cis-1,2-Dichloroethene (µg/L)	< 0.5	I	< 0.5	< 0.5	< 0.5
Chloroethane (µg/L)	< 1	I	< 1	< 1	< 1
Chloromethane (µg/L)	< 2	I	< 2	< 2	< 2
Bromomethane (µg/L)	< 1	I	< 1	< 1	< 1
Dichlorodifluoromethane (µg/L)	< 2	I	2.2	2.3	< 2
Chloropicrin - SW8011M (µg/L)	< 0.212	I	1.98	2.25	< 0.219

Qualifiers:

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

J = Analyte was positively identified/Associated value is an estimate; relative percent difference between duplicate pair greater than 30%

NA = Parameter was not analyzed

< = Not detected above the reported sample detection limit

**TABLE 3
SECOND QUARTER JUNE 2016
GROUNDWATER MONITORING RESULTS**

Parameters	Landfill 1 Area Monitoring Well Locations										(FB-2) Field Blank 06/07/16
	B-326-O2 06/07/16	(DUP-1) B-326-O2 06/07/16	B-326-O3 06/07/16	MW-402-O1 06/07/16	MW-501-O1 06/07/16	MW-512-O1 06/07/16	MW-513-O1 06/07/16				
Mercury (mg/L)	0.00581	0.00572	0.0718	0.00621	0.324	0.00424	0.00851			< 0.0002	
Chloride (mg/L)	87	88	110	760	NA	100	200			0.061 J	
Specific Conductance (µS/cm @25°C)	495	NA	661	2,792	1,371	597	969			NA	
pH (Standard Units)	7.3	NA	6.87	7.44	6.98	6.91	7.26			NA	
Temperature (Degrees Celcius)	10	NA	10.3	9.4	12.9	11.6	11.5			NA	
Salinity (g/L)	0.25	NA	0.33	1.49	0.19	0.3	0.49			NA	
Turbidity (field) (NTU)	0.6	NA	0.3	0.3	1.1	0.5	0.2			NA	
Dissolved Oxygen (mg/L)	5.4	NA	8.9	10.5	4.8	8	5.5			NA	
VOCs											
Acetone (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	0.18	NA	NA			NA	
Benzene (µg/L)	NA	NA	NA	NA	< 0.5	NA	NA			NA	
Toluene (µg/L)	NA	NA	NA	NA	< 0.75	NA	NA			NA	
Ethylbenzene (µg/L)	NA	NA	NA	NA	< 0.5	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	< 1	NA	NA			NA	
Methyltertiarybutylether (µg/L)	NA	NA	NA	NA	< 1	NA	NA			NA	
Trichloroethene (µg/L)	NA	NA	NA	NA	3.7	NA	NA			NA	
1,1-Dichloroethene (µg/L)	NA	NA	NA	NA	< 0.5	NA	NA			NA	
Dibromochloromethane (µg/L)	NA	NA	NA	NA	< 0.5	NA	NA			NA	
Tetrachloroethene (µg/L)	NA	NA	NA	NA	0.6	NA	NA			NA	
Bromodichloromethane (µg/L)	NA	NA	NA	NA	< 0.5	NA	NA			NA	
Bromoform (µg/L)	NA	NA	NA	NA	< 1	NA	NA			NA	
1,1,1-Trichloroethane (µg/L)	NA	NA	NA	NA	< 0.5	NA	NA			NA	
1,1,2-Trichloroethane (µg/L)	NA	NA	NA	NA	< 0.75	NA	NA			NA	
cis-1,2-Dichloroethene (µg/L)	NA	NA	NA	NA	0.21 J	NA	NA			NA	
Chloroethane (µg/L)	NA	NA	NA	NA	< 1	NA	NA			NA	
Chloromethane (µg/L)	NA	NA	NA	NA	< 2	NA	NA			NA	
Bromomethane (µg/L)	NA	NA	NA	NA	< 1	NA	NA			NA	
Dichlorodifluoromethane (µg/L)	NA	NA	NA	NA	0.47 J	NA	NA			NA	
Chloropicrin - SW8011M (µg/L)	NA	NA	NA	NA	< 0.217	NA	NA			NA	

Qualifiers:

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

NA = Parameter was not analyzed

< = Not detected above the reported sample detection limit

**TABLE 4
SECOND QUARTER JUNE 2016
GROUNDWATER MONITORING RESULTS**

Parameters	Landfills 3 & 4 Monitoring Well Locations			
	P-2A	P-13	MW-410-B1	MW-506-B1
	06/07/16	06/07/16	06/07/16	06/07/16
Mercury (mg/L)	0.00121	< 0.0002	0.00075	0.0064
Specific Conductance (µS/cm @25°C)	715	273	649	1,096
pH (Standard Units)	6.77	7.54	7.18	6.8
Temperature (Degrees Celcius)	13.3	11.1	11.5	13.3
Salinity (g/L)	0.36	0.14	0.33	0.56
Turbidity (field) (NTU)	0.2	0.6	0.2	0.3
Dissolved Oxygen (mg/L)	5.1	8.9	3.5	3.1
VOCs				
Acetone (µg/L)	< 5	< 5	< 5	< 5
Chloroform (µg/L)	9.1	0.32 J	8.6	3.5
Carbon Tetrachloride (µg/L)	9.3	0.51	43	9.3
Benzene (µg/L)	< 0.5	< 0.5	< 0.5	< 0.5
Toluene (µg/L)	< 0.75	< 0.75	< 0.75	< 0.75
Ethylbenzene (µg/L)	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Disulfide (µg/L)	< 1	< 1	< 1	< 1
o-Xylene (µg/L)	< 1	< 1	< 1	< 1
m,p-Xylene (µg/L)	< 1	< 1	< 1	< 1
Methyltertiarybutylether (µg/L)	< 1	< 1	< 1	< 1
Trichloroethene (µg/L)	0.2 J	< 0.5	< 0.5	0.54
1,1-Dichloroethene (µg/L)	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane (µg/L)	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene (µg/L)	< 0.5	< 0.5	< 0.5	0.2 J
Bromodichloromethane (µg/L)	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform (µg/L)	< 1	< 1	< 1	< 1
1,1,1-Trichloroethane (µg/L)	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane (µg/L)	< 0.75	< 0.75	< 0.75	< 0.75
cis-1,2-Dichloroethene (µg/L)	< 0.5	< 0.5	< 0.5	< 0.5
Chloroethane (µg/L)	< 1	< 1	< 1	< 1
Chloromethane (µg/L)	< 2	< 2	< 2	< 2
Bromomethane (µg/L)	< 1	< 1	< 1	< 1
Dichlorodifluoromethane (µg/L)	< 2	< 2	< 2	< 2
Chloropicrin (µg/L)	NA	NA	NA	NA

Qualifiers:

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

NA = Parameter was not analyzed

< = Not detected above the reported sample detection limit

TABLE 5
SECOND QUARTER JUNE 2016
GROUNDWATER MONITORING RESULTS

Parameters	Landfill 5 Monitoring Well Locations							(FB-3) Field Blank 06/07/16
	B-303-B1 06/06/16	B-303-B2 06/06/16	B-303-B3 06/06/16	B-303-O1 06/06/16	B-306-B1 06/07/16	B-306-B2 06/07/16	B-306-B2 06/07/16	
Mercury (mg/L)	< 0.0002	< 0.0002	< 0.0002	D	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chloride (mg/L)	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate (mg/L)	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (mg/L)	NA	NA	NA	NA	NA	NA	NA	NA
Total Recoverable Phenolics (ug/L)	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Halides (mg/L)	NA	NA	NA	NA	NA	NA	NA	NA
Specific Conductance (µS/cm @25°C)	150	162	159	D	1,913	1,526	NA	NA
pH (Standard Units)	7.5	7.68	7.27	D	8.39	7.08	NA	NA
Temperature (Degrees Celcius)	10.2	9.1	10.7	D	10.6	11.6	NA	NA
Salinity (g/L)	0.08	0.08	0.08	D	1	0.79	NA	NA
Turbidity (field) (NTU)	0.2	0.2	0.1	D	0.6	1	NA	NA
Dissolved Oxygen (mg/L)	9.6	9.2	8.3	D	0.4	5.2	NA	NA
Iron (mg/L)	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (mg/L)	NA	NA	NA	NA	NA	NA	NA	NA
Sodium (mg/L)	NA	NA	NA	NA	NA	NA	NA	NA
VOCs								
Acetone (µg/L)	< 5	< 5	< 5	D	< 5	< 5	< 5	< 5
Chloroform (µg/L)	< 0.75	< 0.75	< 0.75	D	1.6	0.7 J	< 0.75	< 0.75
Carbon Tetrachloride (µg/L)	< 0.5	< 0.5	< 0.5	D	< 0.5	< 0.5	< 0.5	< 0.5
Benzene (µg/L)	< 0.5	< 0.5	< 0.5	D	< 0.5	< 0.5	< 0.5	< 0.5
Toluene (µg/L)	< 0.75	< 0.75	< 0.75	D	< 0.75	< 0.75	< 0.75	< 0.75
Ethylbenzene (µg/L)	< 0.5	< 0.5	< 0.5	D	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Disulfide (µg/L)	< 1	< 1	< 1	D	< 1	< 1	< 1	< 1
o-Xylene (µg/L)	< 1	< 1	< 1	D	< 1	< 1	< 1	< 1
m,p-Xylene (µg/L)	< 1	< 1	< 1	D	< 1	< 1	< 1	< 1
Methyltertiarybutylether (µg/L)	< 1	< 1	< 1	D	< 1	< 1	< 1	< 1
Trichloroethene (µg/L)	< 0.5	< 0.5	< 0.5	D	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethene (µg/L)	< 0.5	< 0.5	< 0.5	D	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane (µg/L)	< 0.5	< 0.5	< 0.5	D	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene (µg/L)	< 0.5	< 0.5	< 0.5	D	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane (µg/L)	< 0.5	< 0.5	< 0.5	D	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform (µg/L)	< 1	< 1	< 1	D	< 1	< 1	< 1	< 1
1,1,1-Trichloroethane (µg/L)	< 0.5	< 0.5	< 0.5	D	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane (µg/L)	< 0.75	< 0.75	< 0.75	D	< 0.75	< 0.75	< 0.75	< 0.75
cis-1,2-Dichloroethene (µg/L)	< 0.5	< 0.5	< 0.5	D	< 0.5	< 0.5	< 0.5	< 0.5
Chloroethane (µg/L)	< 1	< 1	< 1	D	< 1	< 1	< 1	< 1
Chloromethane (µg/L)	< 2	< 2	< 2	D	< 2	< 2	< 2	< 2
Bromomethane (µg/L)	< 1	< 1	< 1	D	< 1	< 1	< 1	< 1
Dichlorodifluoromethane (µg/L)	< 2	< 2	< 2	D	< 2	< 2	< 2	< 2
Chloropicrin (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA

Abbreviations:

D = Sampling location was dry

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

NA = Parameter was not analyzed

< = Not detected above the reported sample detection limit

TABLE 6
SECOND QUARTER JUNE 2016
GROUNDWATER MONITORING RESULTS

Groundwater Treatment Plant	
Parameters	Influent
	06/08/16
Mercury (mg/L)	0.02939
Chloride (mg/L)	180
Sulfate (mg/L)	22
Alkalinity (mg/L as CaCO₃)	139
Specific Conductance (µS/cm @25°C)	922
pH (Standard Units)	7.86
Temperature (Degrees Celcius)	12.1
Salinity (g/L)	0.59
Turbidity (field) (NTU)	1.3
Dissolved Oxygen (mg/L)	7.7
Iron (mg/L)	0.014 J
Manganese (mg/L)	0.0365
Sodium (mg/L)	155
VOCs	
Acetone (µg/L)	< 100
Chloroform (µg/L)	< 15
Carbon Tetrachloride (µg/L)	< 2.68
Benzene (µg/L)	< 10
Toluene (µg/L)	< 15
Ethylbenzene (µg/L)	< 10
Carbon Disulfide (µg/L)	< 20
o-Xylene (µg/L)	< 20
m,p-Xylene (µg/L)	< 20
Methyltertiarybutylether (µg/L)	< 20
Trichloroethene (µg/L)	< 10
Naphthalene (µg/L)	< 20
1,1-Dichloroethene (µg/L)	< 10
Dibromochloromethane (µg/L)	< 10
Tetrachloroethene (µg/L)	< 10
Bromodichloromethane (µg/L)	< 10
Bromoform (µg/L)	< 20
1,1,1-Trichloroethane (µg/L)	< 10
1,1,2-Trichloroethane (µg/L)	< 15
cis-1,2-Dichlorethene (µg/L)	< 10
Chloroethane (µg/L)	< 20
Chloromethane (µg/L)	< 40
Bromomethane (µg/L)	< 20
Dichlorodifluoromethane (µg/L)	< 40
Chloropicrin - SW8011M (µg/L)	3,230

Abbreviations:

J = Analyte was positively identified/Associated value

is an estimate

< = Not detected above the reported sample detection limit

TABLE 7
SECOND QUARTER JUNE 2016
GROUNDWATER MONITORING RESULTS

Parameters	Trip Blanks						
	QCBT (93H) 06/06/16	QCBT (93I) 06/07/16	QCBT (94D) 06/07/16	QCBT (94B) 06/08/16	QCBT (925) 06/08/16	QCBT (94C) 06/08/16	
VOCs							
Acetone (µg/L)	< 5	< 5	NA	< 5	NA	NA	
Chloroform (µg/L)	< 0.75	< 0.75	NA	< 0.75	NA	NA	
Carbon Tetrachloride (µg/L)	< 0.5	< 0.5	< 0.108	< 0.5	NA	< 0.103	
Benzene (µg/L)	< 0.5	< 0.5	NA	< 0.5	NA	NA	
Toluene (µg/L)	< 0.75	< 0.75	NA	< 0.75	NA	NA	
Ethylbenzene (µg/L)	< 0.5	< 0.5	NA	< 0.5	NA	NA	
Carbon Disulfide (µg/L)	0.33 J	< 1	NA	< 1	NA	NA	
o-Xylene (µg/L)	< 1	< 1	NA	< 1	NA	NA	
m,p-Xylene (µg/L)	< 1	< 1	NA	< 1	NA	NA	
Methyltertiarybutylether (µg/L)	< 1	< 1	NA	< 1	NA	NA	
Trichloroethene (µg/L)	< 0.5	< 0.5	NA	< 0.5	NA	NA	
1,1-Dichloroethene (µg/L)	< 0.5	< 0.5	NA	< 0.5	NA	NA	
Dibromochloromethane (µg/L)	< 0.5	< 0.5	NA	< 0.5	NA	NA	
Tetrachloroethene (µg/L)	< 0.5	< 0.5	NA	< 0.5	NA	NA	
Bromodichloromethane (µg/L)	< 0.5	< 0.5	NA	< 0.5	NA	NA	
Bromoform (µg/L)	< 1	< 1	NA	< 1	NA	NA	
1,1,1-Trichloroethane (µg/L)	< 0.5	< 0.5	NA	< 0.5	NA	NA	
1,1,2-Trichloroethane (µg/L)	< 0.75	< 0.75	NA	< 0.75	NA	NA	
cis-1,2-Dichloroethene (µg/L)	< 0.5	< 0.5	NA	< 0.5	NA	NA	
Chloroethane (µg/L)	< 1	< 1	NA	< 1	NA	NA	
Chloromethane (µg/L)	< 2	< 2	NA	< 2	NA	NA	
Bromomethane (µg/L)	< 1	< 1	NA	< 1	NA	NA	
Dichlorodifluoromethane (µg/L)	< 2	< 2	NA	< 2	NA	NA	
Chloropicrin - SW8011M (µg/L)	NA	NA	< 0.216	NA	< 0.205	< 0.207	

Abbreviations:

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

NA = Parameter was not analyzed

< = Not detected above the reported sample detection limit