**Mallinckrodt US LLC**

January 20, 2017

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

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

Dear Mr. Swain:

Enclosed for your information is a report of the **third 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 were previously submitted to Maine DEP on January 5, 2017.

The fourth quarter 2016 groundwater monitoring event took place the week of December 5, 2016. If you have any questions please feel free to contact me at 314-281-5947.

Sincerely,

Kathy Zeigler

Kathy Zeigler
Director, Environmental Remediation

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

SME
Sevee & Maher Engineers, Inc.

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January 19, 2017

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

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

Dear Ms. Zeigler:

Enclosed are the groundwater quality results from the September 2016 third quarter sampling event at the Orrington Remediation Site in Orrington, Maine (Site). Groundwater samples were obtained from 26 monitoring wells located in the Ferry Road Area - southwestern portion of the Site (six wells), the former Manufacturing Area (two wells), Landfill 1 Area (six wells), Landfill 3 (three wells), Landfill 4 (one well), and Landfill 5 (eight wells). Monitoring well locations are shown on 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 four monitoring wells around Landfill 5 (B-303-O1, B-304-O1, B-303-B3 and B-307-O1) and from MW-503-O1 at the former Manufacturing Area because these wells were dry in the September 2016 sampling round. An influent sample from the Landfill 1 Area groundwater interim extraction system (IES) was also obtained at the on-site water treatment plant for analysis.

Laboratory analyses for the September 2016 third 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 September 2016 sampling round were submitted to MEDEP on January 5, 2017. Groundwater quality results are summarized in Tables 1 through 8. SME field data sheets completed at each well sampled are also included in the attachments to this report.



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## 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), laboratory control sample duplicates (LCSD), 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 four 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, and are summarized in an attachment to the report. The QC data reviewed in the analytical laboratory reports were of acceptable quality for the September 2016 third quarter sampling round.

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

### Ferry Road Area

- QC was within acceptance criteria for routine parameter analyses.
- A field duplicate pair from the Ferry Road Area was within the acceptance criterion for RPD.

### Manufacturing Area

- Bromomethane was detected at a concentration between the MDL and the RL in an associated method blank and field blank. The field blank (FB-1) result was qualified as not detected (U) at the RL.
- Acetone and chloromethane were detected in the trip blank at concentrations between the MDL and the RL. No acetone was detected in the groundwater samples obtained from the former Manufacturing Area. Detections of

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[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.

chloromethane in MW-502-O1 and MW-510-O1 at concentrations between the MDL and RL were qualified as not detected (U) at the RL.

- Three 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.

Landfill 1 Area

- A spiked recovery of mercury in an MS/MSD associated with MW-501-O1 was outside the laboratory's acceptance criteria. No qualification of the result was required because recovery limits do not apply when the sample concentration is equal to or greater than four times the spike concentration added.
- Three 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 from MW-501-01.
- Spike recoveries and/or RPDs of seven VOCs in an MS/MSD associated with MW-501-O1 were outside the laboratory's acceptance criteria; however, these parameters were not detected in the MW-501-O1 groundwater sample.
- Surrogate recoveries for VOC analysis were within the acceptance criteria.
- A field blank associated with Landfill 1 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 in the order 1,000 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

- Bromomethane was detected in a VOC method blank and two groundwater samples in the SDG at a concentration between the MDL and RL. The bromomethane results in wells P-2A and P-13 were qualified as not detected (U) at the RL.
- Three 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 were within the acceptance criteria.
- A field duplicate pair associated with Landfill 3 was within the acceptance criterion for RPD.

Landfill 5

- A VOC method blank contained a concentration of bromomethane between the MDL and RL. Bromomethane was also detected in groundwater samples (B-303-B1, B-303-B2, B-303-B3, B-306-B1 and B-306-B2), and in the associated field blank and trip blank samples at concentrations between the MDL and RL. These sample results were qualified as not detected (U) at the RL.
- Acetone and chloromethane were detected in a trip blank at an estimated concentration between the laboratory MDL and RL. Detectable concentrations of acetone and chloromethane between the MDL and RL detected in B-303-B3 were qualified as not detected at the RL.
- Three 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 were within the acceptance criteria.
- Field blanks associated with TOC replicates had detections between the MDL and RL, and greater than the RL. If field blank and sample results were both between the MDL and RL, the sample results were qualified as not detected at the RL. If the field blank result was between the MDL and RL, and sample results were greater than the RL, the sample results were qualified with a "B" qualifier to indicate an indeterminate amount of sampling or laboratory error. If the field blank result was greater than the RL, and the sample result greater than the RL but less than 10 times the field blank, the sample result was qualified as estimated (J).
- A spiked recovery of one TOC replicate in a MS associated with B-307-B2 was greater than the laboratory's upper acceptance criteria. The TOC replicate was qualified as estimated.
- TOC in the B-304-B1 field duplicate pair exceeded the acceptance criterion for RPD.
- A field blank contained a trace-estimated concentration of sulfate between the laboratory MDL and RL. The sulfate detection was not considered significant because of the historical presence of sulfate in the associated groundwater samples at concentrations in the order 100 times greater than reported in the field blank.
- Total recoverable phenolics were detected in a field blank at a concentration between the MDL and RL. Sample results between the MDL and RL for detections of phenolics in B-304-B1 and B-307-B1 were qualified as not detected (U) at the RL. A duplicate sample from B-304-B1 contained a concentration of total recoverable phenolics greater than the RL. The

duplicate result was qualified ("B") to indicate an indeterminate amount of sampling or laboratory error.

Treatment Plant Influent

- Bromomethane was detected at a concentration between the MDL and the RL in a method blank. Detections of bromomethane between the MDL and the RL in an associated trip blank and the treatment plant influent sample were qualified as not detected (U) at the RL.
- A trip blank associated with the influent sample also had detections of acetone and chloromethane between the MDL and RL. Acetone was not detected in the influent sample. Chloromethane was detected in the influent sample at concentrations between the MDL and RL. The chloromethane influent result was qualified as not detected (U) at the RL.
- Three 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 were within the acceptance criteria.
- Spiked recoveries of mercury and iron in a MS/MSD were outside the laboratory's acceptance criteria. No qualification of the mercury and iron results was necessary because spike recovery limits do not apply when the sample concentration is equal to or greater than four times the spike added.
- Sulfate was detected in a method blank at a concentration between the MDL and RL. The detection was not considered significant because of the historical presence of sulfate in the treatment plant influent sample at 100 times the amount in the method blank.

## LABORATORY ANALYTICAL RESULTS

The distribution of mercury detections in the routine groundwater monitoring round for the third quarter in September 2016 was consistent with previous quarters. Mercury was detected in 12 of the 26 wells that were sampled at the Site. Concentrations in 8 of the 12 monitoring wells that contained detectable mercury exceeded the Site's Media Protection Standard (MPS) of 2 micrograms per liter [µg/L]). Mercury results greater than the MPS ranged from 2.62 µg/L to 216 µg/L. Less than MPS mercury concentrations ranged from 0.1 µg/L to 1.46 µg/L. The average mercury concentration through the first three quarters of 2016 has decreased in 7 of the 8 wells that exceeded the MPS compared to 2015 values.

Higher detectable mercury concentrations are associated with the Landfill 1 Area than the other areas of the Site monitored. The highest mercury values were associated with monitoring wells MW-501-O1 (126 µg/L), located near the Lined Process Lagoon, and with

B-326-O2 (22.2 µg/L), B-326-O3 (216 µg/L), and MW-513-O1 (19.2 µg/L) near the downgradient edge of Landfill 1. Mercury concentrations in wells MW-501-O1, B-326-O2, and B-326-O3 averaged about 50 percent less in 2016 than in 2015. Nearby Landfill 1 Area IES wells EW-1 (67 µg/L), EW-4 (60.8 µg/L) and MW-601 (130 µg/L) have captured groundwater with concentrations of mercury in the order of that detected in B-326-02 , B-326-03, and MW-513-B1, as observed in previous rounds of sampling (documented in quarterly operation summary reports for the IES). Lesser concentrations of mercury were detected in wells MW-402-O1 (2.62 µg/L) and MW-512-O1 (6.1 µg/L), located in areas of Landfill 1 where the saturated sand and gravel is relatively thin.

Monitoring well MW-510-O1 is located in the former Manufacturing Area just downgradient from the former salt storage pad. Mercury was detected in MW-510-O1 (6.39 µg/L) in the third quarter September 2016, and in five of the last six years has not varied much in the quarterly sampling rounds (averaging less than 4 µg/L). The concentration of mercury detected in MW-502-O1 (0.62 µg/L) was less than the MPS, and has been since at least 2011. A representative groundwater sample could not be obtained from MW-503-O1 during the third quarter September 2016 sampling round because of a lack of water in the well, which has been typical for the last several years. Historically, the water quality record over more than five years of monitoring indicated mercury concentrations usually less than the MPS in MW-503-O1.

Landfills 3, 4, and 5, which are located on the ridge area north of the former Manufacturing Area, were undergoing construction for new covers when the third quarter September 2016 sampling round was conducted. Eleven monitoring wells in the ridge area, and one monitoring well (P-2A) just south of the ridge, were sampled during the September 2016 routine quarterly round; i.e., four wells associated with Landfills 3 and 4, and eight wells around Landfill 5. Only MW-506-B1 (38.8 µg/L) installed in Landfill 4 contained a detectable concentration of mercury exceeding the MPS, which is typical for the well. However, like most of the comparisons to average mercury concentrations in 2015, the 2016 results through the third quarter of sampling indicated that the average mercury concentration at MW-506-B1 decreased by about 65 percent. Mercury detections in groundwater samples obtained downgradient from Landfill 3 and Landfill 4 in monitoring wells MW-410-B1 (0.1 µg/L), P-2A (1.46 µg/L), and P-13 (0.25 µg/L) were less than the MPS, and continue to decrease over time. Trace mercury levels less than the laboratory RL have been infrequently detected in P-13 and the MPS has not been exceeded since 2010. Detectable levels of mercury were not found in the eight monitoring wells around Landfill 5 sampled during the third quarter of 2016, consistent with previous rounds.

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, also consistent with previous water quality at these locations.

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 was analyzed for chloropicrin. No detections of chloropicrin were found in these three monitoring wells in September 2016. Since 2011, chloropicrin has been sporadically detected in MW-510-O1 at less than the MPS, and very infrequently in MW-501-O1 and MW-502-O1.

Monitoring wells in the former Manufacturing Area and around Landfills 3, 4, and 5 are routinely analyzed for VOCs during quarterly sampling rounds. In addition to chloropicrin, seven different VOCs were detected in the third quarter September 2016 sampling round, which were distributed among nine wells. Carbon tetrachloride was detected at concentrations exceeding the MPS (3 µg/L) in MW-506-B1 (8.4 µg/L) at Landfill 4, and in P-2A (16 µg/L) downgradient of Landfills 3 and 4, which was consistent with previous quarterly sampling rounds. Detectable levels of less than MPS concentrations of carbon tetrachloride were present in five other Site wells. No other detectable VOCs exceeded an MPS or Maine Maximum Exposure Guideline (MEG) concentration in the routine quarterly sampling round in September 2016. Chloroform was the most frequently detected VOC, but the concentrations were well below the MPS (57 µg/L). The remaining VOCs detected in order of descending frequency consisted of trichloroethene, tetrachloroethene, 1,1-dichloroethene and dichlorodifluoromethane, and chloroethane.

The second round of semiannual detection monitoring at Landfill 5 was completed during third quarter monitoring in September 2016. Groundwater from monitoring wells B-304-B1, B-307-B1, and B-307-B2 was analyzed for sodium, chloride, sulfate, iron, manganese, total recoverable phenolics, total organic carbon (TOC), and total organic halides (TOX). Three shallow wells, i.e., B-304-O1, B-306-B3 and B-307-O1, were dry and therefore these groundwater samples could not be obtained.

Sodium concentrations (5 to 72 milligrams per liter [mg/L]) in groundwater around Landfill 5 exceeded the Maine MEG of 20 mg/L in B-304-B1. Chloride (2.6 to 57 mg/L) and sulfate (14 to 29 mg/L) concentrations were less than the Federal Secondary Maximum Contaminant Level of 250 mg/L. Sodium, chloride, and sulfate concentrations in September 2016 were similar to the results from the semiannual detection monitoring in March 2016. Manganese (0.0147 mg/L) was detected in monitoring well B-304-B1 at a concentration less than the Maine MEG (0.5 mg/L), and was not detected in monitoring wells B-307-B1 and B-307-B2.

Total recoverable phenolics were detected in B-304-B1 and B-307-B1, and a field blank associated with Landfill 5, at concentrations between the MDL and RL; therefore, the results from B-304-B1 and B-307-B1 were qualified as not detected at the RL (30 µg/L) as discussed

previously in the QC section. The total recoverable phenolics result from a duplicate sample at B-304-B1 (63 µg/L) was qualified to indicate uncertainty due to sampling or laboratory error. The Maine MEG for phenol is 2,000 µg/L. The only detections of total recoverable phenolics were two orders of magnitude less than this limit.

Four replicates from B-304-B1 and its duplicate, and B-307-B1 and B-307-B2 were analyzed for TOC and TOX as part of detection monitoring at Landfill 5. Replicate results were averaged from each of these well locations. Data qualifiers were applied to the TOC results because of detections in the associated field blank at concentrations greater than the MDL and RL. The average TOC concentrations in the B-304-B1 duplicate pair (0.62 and 1.1 mg/L) were greater than the RL; therefore, based on professional judgement the results were accepted as reported by the laboratory but qualified (B) to reflect uncertainty due to TOC detections in the associated field blank. The TOC concentrations in the B-307-B1 replicates were between the MDL and RL, and the averaged replicate result qualified as not detected at the RL. Half of the TOC replicates results for B-307-B2 were between the MDL and RL, and the other half greater than the RL. The replicate average for TOC in B-307-B2 (0.49 mg/L) was less than the RL; therefore, the sample result was also qualified as not detected at the RL because of the associated field blank contamination. Less than RL detections of TOX were present in the replicate samples from B-304-B1, but no detectable TOX was present in the B-307-B1 and B-307-B2 groundwater samples or the field blank. The trace levels of TOX were accepted as reported, and were consistent with the historical water quality of B-304-B1.

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 7. 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 September 2016 third 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 (2.62 to 216 µg/L).

- Former Manufacturing Area – Mercury was detected in MW-510-O1 (6.39 µg/L) at a concentration greater than the MPS, and less than the MPS in MW-502-O1 (0.62 µg/L), results that are typical for these two locations.

Chloropicrin was not detected in the monitoring wells. VOC detections did not exceed the respective MPSs.

- Landfills 3 and 4 – Mercury was detected less than the MPS on the landfill ridge in P-13 (0.25 µg/L) to the north of Landfill 3, and to the south and southwest downgradient of Landfills 3 and 4 in MW-410-B1 (0.1 µg/L) and P-2A (1.46 µg/L). The mercury concentration at MW-506-B1 (38.8 µg/L) in the middle of Landfill 4 is the only monitoring well where mercury exceeded the MPS on the north ridge. Only carbon tetrachloride was detected in concentrations greater than the MPS of 3 µg/L in MW-506-B1 (8.4 µg/L) and P-2A (16 µg/L). Other detectable VOC concentrations were much less than their respective MPSs. These results are similar with previous quarterly sampling rounds at the Site.

- Landfill 5 – Mercury was not detected in the groundwater sampled from the surrounding Landfill 5 monitoring wells. The concentrations of the two detected VOCs: carbon tetrachloride and chloroform, were significantly less than the respective MPSs.

- Ferry Road Area and Residential Wells – Detectable mercury was not present 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

Weather monitoring at the on-site station at the Orrington Remediation Site showed below normal precipitation for the 5-month period preceding the third quarter September 2016 groundwater sampling round. Rainfall totaled about 7 inches at the Site over the 3.5-month period between the second and third quarter 2016 sampling rounds in contrast to the more than 10 inches in the monthly normal precipitation records for the area (NOAA National Climatic Data Center).[4] The rainfall deficit was consistent with the abnormally dry to severe drought conditions experienced between the second quarter June 2016 and third quarter September 2016 sampling rounds (U.S. Drought Monitor)[5].

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[4] *Record of Climatological Observations, Bangor International Airport, ME.* National Climatic Data Center Federal Building, Asheville, North Carolina, http://www.ncdc.noaa.gov (accessed October 4, 2016).

[5] *U.S. Drought Monitor*, http://droughtmonitor.unl.edu (accessed October 4, 2016).

The extended period of abnormally dry conditions preceding the third quarter September 2016 sampling round was reflected in decreasing groundwater levels at the Site. Groundwater fluctuations between sampling rounds were more prominent in monitoring wells located in the ridge area of the Site north of the former Manufacturing Area. Third quarter September 2016 water levels in the ridge area decreased between 1 and 8 feet since the second quarter round in June 2016, and collectively averaged about 3 feet lower. All four of the ridge area shallow wells screened in soil or the top of bedrock were dry. Water levels in wells monitored in the lower topography of the Site; i.e., former Manufacturing Area, Ferry Road Area, and Landfill 1 Area, typically experience less groundwater level changes between the quarterly sampling rounds. Water levels in several of the wells in the Landfill 1 Area and some in the Ferry Road Area experience a daily tidally-induced fluctuation from the nearby Penobscot River. Water level elevations measured during the September 2016 sampling round averaged a decrease of about two feet in the Ferry Road Area, and less than one foot in the former Manufacturing Area compared to the previous June 2016 quarter. The Landfill 1 Area wells monitored are located closer to the Penobscot River than most of the other Site wells. For water level monitoring comparison, the average groundwater elevation on the day the Landfill 1 Area wells were sampled was determined from pressure transducers in the wells, or nearby piezometers with pressure transducers. The daily average groundwater elevation in the Landfill 1 Area wells monitored near the downgradient margin of the landfill was about 0.33 feet NAVD 88, which was about 0.4 feet lower than in the second quarter June 2016 round.

Groundwater level elevations in monitoring wells from the routine quarterly sampling program were compared between the third quarter sampling rounds in September 2016 and August 2015. Most of the groundwater elevations in the monitoring wells across the Site were lower in September 2016, except for some in the Ferry Road Area and Landfill 1 Area that are affected by the river tide. The landfill ridge area and former Manufacturing Area wells averaged lower groundwater elevations of about 2.4 feet and 0.7 feet, respectively. Monitoring wells in the Landfill 1 Area and Ferry Road averaged less than a 0.2-foot decrease in groundwater elevation.

Although groundwater level elevations were lower in September 2016, more precipitation was recorded during the 13-month period preceding third quarter September 2016 than the 11-month interval between the third quarters of August 2015 and September 2014. Three months of abnormally dry conditions occurred previous to the third quarter sampling rounds in 2015 and 2016; however, the three weeks immediately prior the September 2016 quarterly round also experienced moderate to severe drought, as mentioned previously. While the 2016 drought in Maine probably contributed to the lower groundwater levels measured during the third quarter, the lack of snowfall (39 inches) during the 2015-2016 winter compared to the previous winter (120 inches) likely resulted in less recharge to the groundwater system and consequently lower groundwater levels.

## SCHEDULE FOR FUTURE MONITORING

The fourth quarter 2016 groundwater sampling event at the Orrington Remediation Site was completed during the week of December 5, 2016. In addition to the routine monitoring, groundwater samples were also obtained from the five interim groundwater extraction wells that are operating in the Landfill 1 Area. MEDEP was notified in advance of the sampling schedule. If you have any questions concerning the September 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 8
- Data Tables
- Relative Percent Difference for Duplicate Samples
- Field Data Sheets

# FIGURE 1 – WELL LOCATIONS

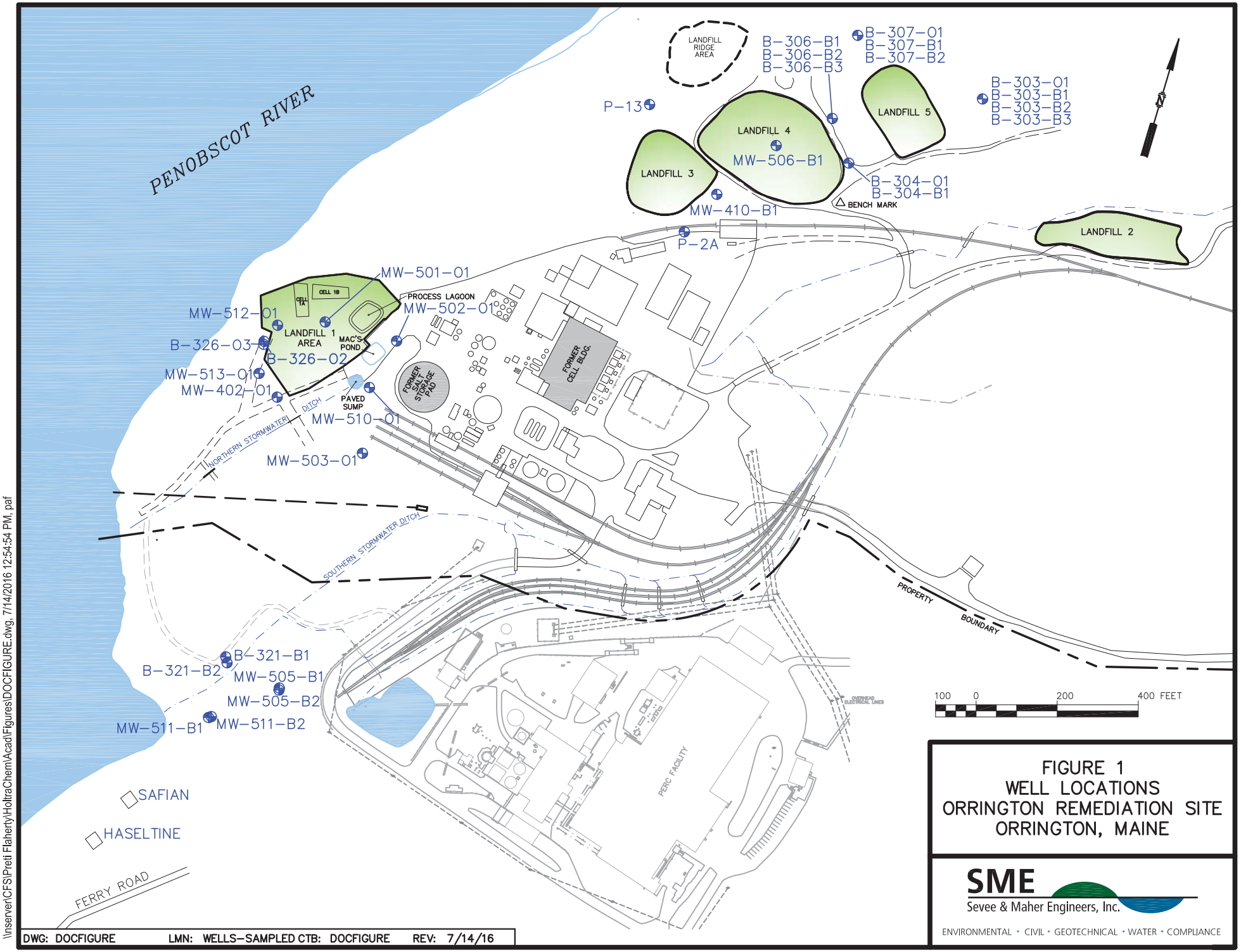


FIGURE 1
WELL LOCATIONS
ORRINGTON REMEDIATION SITE
ORRINGTON, MAINE

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DWG: DOCFIGURE LMN: WELLS-SAMPLED CTB: DOCFIGURE REV: 7/14/16

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# GROUNDWATER MONITORING RESULTS SUMMARY
# TABLES 1 THROUGH 8

SME
Sevee & Maher Engineers, Inc.

**TABLE 1**
**THIRD QUARTER SEPTEMBER 2016**
**GROUNDWATER MONITORING RESULTS**

| Parameters | Ferry Road Monitoring Well Locations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Haseltine | (DUP-4) Haseltine | Safian | B-321-B1 | B-321-B2 | MW-505-B1 | MW-505-B2 | MW-511-B1 | MW-511-B2 |
| | 09/27/16 | 09/27/16 | 09/27/16 | 09/26/16 | 09/26/16 | 09/26/16 | 09/26/16 | 09/26/16 | 09/26/16 |
| Mercury (mg/L) | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0002 |
| Chloride (mg/L) | 1,600 | 1,600 | 1,000 | 1,700 | 870 | 2,500 | 2,100 | 2,600 | 2,600 |
| Specific Conductance (µS/cm @ 25°C) | 5,146 | NA | 3,474 | 5,573 | 3,088 | 8,060 | 6,969 | 8,117 | 8,073 |
| pH (Standard Units) | 7.05 | NA | 7.32 | 6.98 | 7.25 | 7.01 | 7.06 | 6.99 | 7.01 |
| Temperature (Degrees Celcius) | 12.3 | NA | 15.3 | 9.8 | 10 | 10.1 | 9.8 | 11.2 | 10.5 |
| Salinity (g/L) | 2.86 | NA | 1.88 | 3.11 | 1.66 | 4.61 | 3.95 | 4.65 | 4.62 |
| Turbidity (field) (NTU) | 3.6 | NA | 7.5 | 4.2 | 6.5 | 1.6 | 1.1 | 4.1 | 1.1 |
| Dissolved Oxygen (mg/L) | 6 | NA | 3.7 | 0.4 | 1.3 | 0.8 | 1.0 | 0.3 | 0.5 |
| *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 |
| 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-Dichlorethene (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 |

Qualifiers:

NA = Parameter was not analyzed

< = Not detected above the reported sample detection limit

**TABLE 2**
**THIRD QUARTER SEPTEMBER 2016**
**GROUNDWATER MONITORING RESULTS**

| Former Manufacturing Area Monitoring Well Locations | | | | |
|---|---|---|---|---|
| **Parameters** | **MW-502-O1** | **MW-503-O1** | **MW-510-O1** | **(FB-1) Field Blank** |
| | **09/28/16** | **09/28/16** | **09/28/16** | **09/28/16** |
| **Mercury (mg/L)** | 0.00062 | D | 0.00639 | < 0.0002 |
| **Specific Conductance (µS/cm @ 25°C)** | 1,550 | D | 82,113 | NA |
| **pH (Standard Units)** | 7.83 | D | 7.22 | NA |
| **Temperature (Degrees Celcius)** | 14.9 | D | 12.7 | NA |
| **Salinity (g/L)** | 0.8 | D | 59.72 | NA |
| **Turbidity (field) (NTU)** | 2.2 | D | 1.6 | NA |
| **Dissolved Oxygen (mg/L)** | 0.3 | D | 0.4 | NA |
| ***VOCs*** | | | | |
| **Acetone (µg/L)** | < 5 | D | < 5 | < 5 |
| **Chloroform (µg/L)** | 2.8 | D | 9.6 | < 0.75 |
| **Carbon Tetrachloride (µg/L)** | < 0.102 | D | 0.111 | < 0.105 |
| **Benzene (µg/L)** | < 0.5 | D | < 0.5 | < 0.5 |
| **Toluene (µg/L)** | < 0.75 | D | < 0.75 | < 0.75 |
| **Ethylbenzene (µg/L)** | < 0.5 | D | < 0.5 | < 0.5 |
| **Carbon Disulfide (µg/L)** | < 1 | D | < 1 | < 1 |
| **o-Xylene (µg/L)** | < 1 | D | < 1 | < 1 |
| **m,p-Xylene (µg/L)** | < 1 | D | < 1 | < 1 |
| **Methyltertiarybutylether (µg/L)** | < 1 | D | < 1 | < 1 |
| **Trichloroethene (µg/L)** | < 0.5 | D | 0.24 J | < 0.5 |
| **1,1-Dichloroethene (µg/L)** | < 0.5 | D | 0.23 J | < 0.5 |
| **Dibromochloromethane (µg/L)** | < 0.5 | D | < 0.5 | < 0.5 |
| **Tetrachloroethene (µg/L)** | < 0.5 | D | < 0.5 | < 0.5 |
| **Bromodichloromethane (µg/L)** | < 0.5 | D | < 0.5 | < 0.5 |
| **Bromoform (µg/L)** | < 1 | D | < 1 | < 1 |
| **1,1,1-Trichloroethane (µg/L)** | < 0.5 | D | < 0.5 | < 0.5 |
| **1,1,2-Trichloroethane (µg/L)** | < 0.75 | D | < 0.75 | < 0.75 |
| **cis-1,2-Dichlorethene (µg/L)** | < 0.5 | D | < 0.5 | < 1 |
| **Chloroethane (µg/L)** | < 1 | D | 0.38 J | < 0.5 |
| **Chloromethane (µg/L)** | 2 U | D | 2 U | < 2 |
| **Bromomethane (µg/L)** | < 1 | D | < 1 | 1 U |
| **Dichlorodifluoromethane (µg/L)** | < 2 | D | 3.2 | < 2 |
| **Chloropicrin - SW8011M (µg/L)** | < 0.204 | D | < 0.204 | < 0.21 |

Qualifiers:
D = Sample location was dry
J = Analyte was positively identified/Associated value is an estimate
U = Sample result qualified as not detected at the reporting limit due to presence in an associated blank
NA = Parameter was not analyzed
< = Not detected above the reported sample detection limit

**TABLE 3**
**THIRD QUARTER SEPTEMBER 2016**
**GROUNDWATER MONITORING RESULTS**

| Landfill 1 Area Monitoring Well Locations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Parameters** | **B-326-O2** | **B-326-O3** | **MW-402-O1** | **MW-501-O1** | **MW-512-O1** | **MW-513-O1** | **(DUP-1) MW-513-O1** | **FB-2** |
| | **09/27/16** | **09/27/16** | **09/27/16** | **09/27/16** | **09/27/16** | **09/27/16** | **09/27/16** | **09/27/16** |
| **Mercury (mg/L)** | 0.0222 | 0.216 | 0.00262 | 0.126 | 0.0061 | 0.01915 | 0.01865 | < 0.0002 |
| **Chloride (mg/L)** | 340 | 230 | 460 | NA | 170 | 240 | 240 | 0.057 J |
| **Specific Conductance (µS/cm @ 25°C)** | 1,407 | 1,115 | 1,854 | 1,692 | 946 | 1,092 | NA | NA |
| **pH (Standard Units)** | 7.18 | 6.77 | 7.18 | 6.8 | 6.97 | 7.22 | NA | NA |
| **Temperature (Degrees Celcius)** | 10.4 | 10.3 | 10.7 | 12.3 | 11 | 11.9 | NA | NA |
| **Salinity (g/L)** | 0.73 | 0.57 | 0.97 | 0.88 | 0.48 | 0.56 | NA | NA |
| **Turbidity (field) (NTU)** | 1.4 | 1.8 | 1 | 3.5 | 0.8 | 0.6 | NA | NA |
| **Dissolved Oxygen (mg/L)** | 3.3 | 9.1 | 9 | 2.4 | 5.1 | 0.5 | NA | NA |
| ***VOCs*** | | | | | | | | |
| **Acetone (µg/L)** | NA | NA | NA | < 5 | NA | NA | NA | NA |
| **Chloroform (µg/L)** | NA | NA | NA | 3.4 | NA | NA | NA | NA |
| **Carbon Tetrachloride (µg/L)** | NA | NA | NA | 0.136 | NA | NA | NA | NA |
| **Benzene (µg/L)** | NA | NA | NA | < 0.5 | NA | NA | NA | NA |
| **Toluene (µg/L)** | NA | NA | NA | < 0.75 | NA | NA | NA | NA |
| **Ethylbenzene (µg/L)** | NA | NA | NA | < 0.5 | NA | NA | NA | NA |
| **Carbon Disulfide (µg/L)** | NA | NA | NA | < 1 | NA | NA | NA | NA |
| **o-Xylene (µg/L)** | NA | NA | NA | < 1 | NA | NA | NA | NA |
| **m,p-Xylene (µg/L)** | NA | NA | NA | < 1 | NA | NA | NA | NA |
| **Methyltertiarybutylether (µg/L)** | NA | NA | NA | < 1 | NA | NA | NA | NA |
| **Trichloroethene (µg/L)** | NA | NA | NA | 4.9 | NA | NA | NA | NA |
| **1,1-Dichloroethene (µg/L)** | NA | NA | NA | < 0.5 | NA | NA | NA | NA |
| **Dibromochloromethane (µg/L)** | NA | NA | NA | < 0.5 | NA | NA | NA | NA |
| **Tetrachloroethene (µg/L)** | NA | NA | NA | 0.79 | NA | NA | NA | NA |
| **Bromodichloromethane (µg/L)** | NA | NA | NA | < 0.5 | NA | NA | NA | NA |
| **Bromoform (µg/L)** | NA | NA | NA | < 1 | NA | NA | NA | NA |
| **1,1,1-Trichloroethane (µg/L)** | NA | NA | NA | < 0.5 | NA | NA | NA | NA |
| **1,1,2-Trichloroethane (µg/L)** | NA | NA | NA | < 0.75 | NA | NA | NA | NA |
| **cis-1,2-Dichlorethene (µg/L)** | NA | NA | NA | < 1 | NA | NA | NA | NA |
| **Chloroethane (µg/L)** | NA | NA | NA | < 0.5 | NA | NA | NA | NA |
| **Chloromethane (µg/L)** | NA | NA | NA | < 2 | NA | NA | NA | NA |
| **Bromomethane (µg/L)** | NA | NA | NA | < 1 | NA | NA | NA | NA |
| **Dichlorodifluoromethane (µg/L)** | NA | NA | NA | 0.3 J | NA | NA | NA | NA |
| **Chloropicrin - SW8011M (µg/L)** | NA | NA | NA | < 0.204 | 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 4**
**THIRD QUARTER SEPTEMBER 2016**
**GROUNDWATER MONITORING RESULTS**

| Landfills 3 & 4 Monitoring Well Locations | | | | | |
|---|---|---|---|---|---|
| **Parameters** | **P-2A** | **(DUP-2) P-2A** | **P-13** | **MW-410-B1** | **MW-506-B1** |
| | **09/28/16** | **09/28/16** | **09/27/16** | **09/28/16** | **09/28/16** |
| **Mercury (mg/L)** | 0.00146 | 0.00147 | 0.00025 | 0.0001 J | 0.0388 |
| **Specific Conductance (µS/cm @ 25°C)** | 901 | NA | 781 | 340 | 1,491 |
| **pH (Standard Units)** | 7.02 | NA | 7.29 | 7.78 | 6.9 |
| **Temperature (Degrees Celcius)** | 13.3 | NA | 14.1 | 10.6 | 10.8 |
| **Salinity (g/L)** | 0.46 | NA | 0.39 | 0.17 | 0.77 |
| **Turbidity (field) (NTU)** | 0.5 | NA | 2.9 | 0.3 | 0.8 |
| **Dissolved Oxygen (mg/L)** | 2.5 | NA | 5.2 | 3.2 | 2.4 |
| ***VOCs*** | | | | | |
| **Acetone (µg/L)** | < 5 | < 5 | < 5 | < 5 | < 5 |
| **Chloroform (µg/L)** | 7.3 | 7.4 | 1.8 | 0.89 | 3.9 |
| **Carbon Tetrachloride (µg/L)** | 16 | 16 | 2.4 | 2.1 | 8.4 |
| **Benzene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 |
| **Toluene (µg/L)** | < 0.75 | < 0.75 | < 0.75 | < 0.75 | < 0.75 |
| **Ethylbenzene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 |
| **Carbon Disulfide (µg/L)** | < 1 | < 1 | < 1 | < 1 | < 1 |
| **o-Xylene (µg/L)** | < 1 | < 1 | < 1 | < 1 | < 1 |
| **m,p-Xylene (µg/L)** | < 1 | < 1 | < 1 | < 1 | < 1 |
| **Methyltertiarybutylether (µg/L)** | < 1 | < 1 | < 1 | < 1 | < 1 |
| **Trichloroethene (µg/L)** | 0.3 J | 0.29 J | 0.25 J | < 0.5 | 0.58 |
| **1,1-Dichloroethene (µg/L)** | < 0.5 | < 0.5 | 0.39 J | < 0.5 | < 0.5 |
| **Dibromochloromethane (µg/L)** | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 |
| **Tetrachloroethene (µg/L)** | 0.23 J | 0.19 J | < 0.5 | < 0.5 | 0.25 J |
| **Bromodichloromethane (µg/L)** | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 |
| **Bromoform (µg/L)** | < 1 | < 1 | < 1 | < 1 | < 1 |
| **1,1,1-Trichloroethane (µg/L)** | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 |
| **1,1,2-Trichloroethane (µg/L)** | < 0.75 | < 0.75 | < 0.75 | < 0.75 | < 0.75 |
| **cis-1,2-Dichlorethene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 |
| **Chloroethane (µg/L)** | < 1 | < 1 | < 1 | < 1 | < 1 |
| **Chloromethane (µg/L)** | < 2 | < 2 | < 2 | < 2 | < 2 |
| **Bromomethane (µg/L)** | 1 U | < 1 | 1 U | < 1 | < 1 |
| **Dichlorodifluoromethane (µg/L)** | < 2 | < 2 | < 2 | < 2 | < 2 |
| **Chloropicrin (µg/L)** | NA | NA | NA | NA | NA |

Qualifiers:

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

U = Sample result qualified as not detected at the reporting limit due to presence in an associated blank

NA = Parameter was not analyzed

< = Not detected above the reported sample detection limit

**TABLE 5**
**THIRD QUARTER SEPTEMBER 2016**
**GROUNDWATER MONITORING RESULTS**

| Parameters | Landfill 5 Monitoring Well Locations | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B-303-B1 | B-303-B2 | B-303-B3 | B-303-O1 | B-304-B1 | (DUP-3) B-304-B1 | B-304-O1 | B-306-B1 | B-306-B2 | B-306-B3 | B-307-B1 | B-307-B2 | B-307-O1 | (FB-3) Field Blank |
| | 09/26/16 | 09/26/16 | 09/26/16 | 09/26/16 | 09/27/16 | 09/27/16 | 09/27/16 | 09/27/16 | 09/27/16 | 09/27/16 | 09/27/16 | 09/27/16 | 09/27/16 | 09/27/16 |
| **Mercury (mg/L)** | < 0.0002 | < 0.0002 | < 0.0002 | D | < 0.0002 | < 0.0002 | D | < 0.0002 | < 0.0002 | D | < 0.0002 | < 0.0002 | D | < 0.0002 |
| **Chloride (mg/L)** | NA | NA | NA | NA | 57 | 56 | D | NA | NA | D | 2.8 | 2.6 | D | < 0.5 |
| **Sulfate (mg/L)** | NA | NA | NA | NA | 19 | 21 | D | NA | NA | D | 29 | 14 | D | 0.34 J |
| **Iron (mg/L)** | NA | NA | NA | NA | < 0.05 | < 0.05 | D | NA | NA | D | < 0.05 | < 0.05 | D | < 0.05 |
| **Manganese (mg/L)** | NA | NA | NA | NA | 0.0147 | 0.0156 | D | NA | NA | D | < 0.01 | < 0.01 | D | < 0.01 |
| **Sodium (mg/L)** | NA | NA | NA | NA | 72 | 70 | D | NA | NA | D | 16 | 5 | D | < 2.0 |
| **Organic Carbon (mg/L)** [1] | NA | NA | NA | NA | 1.1 JB [2] | 0.62 JB [2] | D | NA | NA | D | 0.5 U | 0.5 U | D | 0.36 J |
| **Total Organic Halides (mg/L)** [1] | NA | NA | NA | NA | 0.0128 J | 0.0124 J | D | NA | NA | D | < 0.03 | < 0.03 | D | < 0.03 |
| **Total Recoverable Phenolics (ug/L)** | NA | NA | NA | NA | 30 U | 63 B | D | NA | NA | D | 30 U | < 30 | D | 10 J |
| **Specific Conductance (µS/cm @ 25°C)** | 178 | 173 | 140 | D | 562 | NA | D | 1916 | 1769 | D | 263 | 182 | D | NA |
| **pH (STU)** | 7.68 | 7.77 | 7.03 | D | 7.74 | NA | D | 8.17 | 7.44 | D | 8.21 | 8.45 | D | NA |
| **Temperature (Deg C)** | 12 | 11.7 | 11.7 | D | 11.9 | NA | D | 12.2 | 13.1 | D | 11.1 | 10.5 | D | NA |
| **Salinity (g/L)** | 0.09 | 0.09 | 0.07 | D | 0.28 | NA | D | 1 | 0.92 | D | 0.13 | 0.09 | D | NA |
| **Turbidity (field) (NTU)** | 0.3 | 0.4 | 1.6 | D | 0.5 | NA | D | 0.2 | 0.1 | D | 0.4 | 0.2 | D | NA |
| **Dissolved Oxygen (mg/L)** | 7.3 | 8 | 7.3 | D | 0.6 | NA | D | 0.4 | 2.9 | D | 0.5 | 4.5 | D | NA |
| ***VOCs*** | | | | | | | | | | | | | | |
| **Acetone (µg/L)** | < 5 | < 5 | 5 U | D | NA | NA | NA | < 5 | < 5 | NA | NA | NA | NA | < 5 |
| **Chloroform (µg/L)** | < 0.75 | < 0.75 | < 0.75 | D | NA | NA | NA | 1.6 | 0.74 J | NA | NA | NA | NA | < 0.75 |
| **Carbon Tetrachloride (µg/L)** | < 0.5 | < 0.5 | < 0.5 | D | NA | NA | NA | 0.18 J | < 0.5 | NA | NA | NA | NA | < 0.5 |
| **Benzene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | D | NA | NA | NA | < 0.5 | < 0.5 | NA | NA | NA | NA | < 0.5 |
| **Toluene (µg/L)** | < 0.75 | < 0.75 | < 0.75 | D | NA | NA | NA | < 0.75 | < 0.75 | NA | NA | NA | NA | < 0.75 |
| **Ethylbenzene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | D | NA | NA | NA | < 0.5 | < 0.5 | NA | NA | NA | NA | < 0.5 |
| **Carbon Disulfide (µg/L)** | < 1 | < 1 | < 1 | D | NA | NA | NA | < 1 | < 1 | NA | NA | NA | NA | < 1 |
| **o-Xylene (µg/L)** | < 1 | < 1 | < 1 | D | NA | NA | NA | < 1 | < 1 | NA | NA | NA | NA | < 1 |
| **m,p-Xylene (µg/L)** | < 1 | < 1 | < 1 | D | NA | NA | NA | < 1 | < 1 | NA | NA | NA | NA | < 1 |
| **Methyltertiarybutylether (µg/L)** | < 1 | < 1 | < 1 | D | NA | NA | NA | < 1 | < 1 | NA | NA | NA | NA | < 1 |
| **Trichloroethene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | D | NA | NA | NA | < 0.5 | < 0.5 | NA | NA | NA | NA | < 0.5 |
| **1,1-Dichloroethene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | D | NA | NA | NA | < 0.5 | < 0.5 | NA | NA | NA | NA | < 0.5 |
| **Dibromochloromethane (µg/L)** | < 0.5 | < 0.5 | < 0.5 | D | NA | NA | NA | < 0.5 | < 0.5 | NA | NA | NA | NA | < 0.5 |
| **Tetrachloroethene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | D | NA | NA | NA | < 0.5 | < 0.5 | NA | NA | NA | NA | < 0.5 |
| **Bromodichloromethane (µg/L)** | < 0.5 | < 0.5 | < 0.5 | D | NA | NA | NA | < 0.5 | < 0.5 | NA | NA | NA | NA | < 0.5 |
| **Bromoform (µg/L)** | < 1 | < 1 | < 1 | D | NA | NA | NA | < 1 | < 1 | NA | NA | NA | NA | < 1 |
| **1,1,1-Trichloroethane (µg/L)** | < 0.5 | < 0.5 | < 0.5 | D | NA | NA | NA | < 0.5 | < 0.5 | NA | NA | NA | NA | < 0.5 |
| **1,1,2-Trichloroethane (µg/L)** | < 0.75 | < 0.75 | < 0.75 | D | NA | NA | NA | < 0.75 | < 0.75 | NA | NA | NA | NA | < 0.75 |
| **cis-1,2-Dichlorethene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | D | NA | NA | NA | < 0.5 | < 0.5 | NA | NA | NA | NA | < 0.5 |
| **Chloroethane (µg/L)** | < 1 | < 1 | < 1 | D | NA | NA | NA | < 1 | < 1 | NA | NA | NA | NA | < 1 |
| **Chloromethane (µg/L)** | < 2 | < 2 | 2 U | D | NA | NA | NA | < 2 | < 2 | NA | NA | NA | NA | < 2 |
| **Bromomethane (µg/L)** | 1 U | 1 U | 1 U | D | NA | NA | NA | 1 U | 1 U | NA | NA | NA | NA | 1 U |
| **Dichlorodifluoromethane (µg/L)** | < 2 | < 2 | < 2 | D | NA | NA | NA | < 2 | < 2 | NA | NA | NA | NA | < 2 |
| **Chloropicrin (µg/L)** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

Abbreviations:
B = Sample result greater than the reporting limit, parameter detected in an associated blank
D = Sample location was dry
J = Analyte was positively identified/Associated value is an estimate below reporting limit
U = Sample result qualified as not detected at the reporting limit due to presence in an associated blank
NA = Parameter was 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. Qualified as an estimated (J) value due to a Relative Percent Difference exceeding 30% between the B-304-B1 duplicate pair.

**TABLE 6**
**THIRD QUARTER SEPTEMBER 2016**
**GROUNDWATER MONITORING RESULTS**

| Landfill 5 Monitoring Well Locations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Parameters** | **B-304-B1** | **(DUP-3) B-304-B1** | **B-304-O1** | **B-306-B3** | **B-307-B1** | **B-307-B2** | **B-307-O1** | **(FB-3) Field Blank** |
| | **09/27/16** | **09/27/16** | **09/27/16** | **09/27/16** | **09/27/16** | **09/27/16** | **09/27/16** | **09/27/16** |
| **Total Organic Halides - 1 (mg/L)** | 0.0128 J | 0.0108 J | I | I | < 0.03 | < 0.03 | I | < 0.03 |
| **Total Organic Halides - 2 (mg/L)** | 0.0100 J | 0.0171 J | I | I | < 0.03 | < 0.03 | I | < 0.03 |
| **Total Organic Halides - 3 (mg/L)** | 0.0140 J | 0.0110 J | I | I | < 0.03 | < 0.03 | I | < 0.03 |
| **Total Organic Halides - 4 (mg/L)** | 0.0143 J | 0.0108 J | I | I | < 0.03 | < 0.03 | I | < 0.03 |
| **Total Organic Carbon - 1 (mg/L)** | 1.6 B | 0.59 B | I | I | 0.50 U | 0.50 U | I | 0.17 J |
| **Total Organic Carbon - 2 (mg/L)** | 0.62 B | 0.62 B | I | I | 0.50 U | 0.50 U | I | 0.16 J |
| **Total Organic Carbon - 3 (mg/L)** | 1.39 B | 0.63 B | I | I | 0.50 U | 0.70 B | I | 0.15 J |
| **Total Organic Carbon - 4 (mg/L)** | 0.8 J | 0.62 J | I | I | 0.50 U | 0.68 J | I | 0.94 |

Abbreviations:

B = Sample result greater than the reporting limit, parameter detected in an associated blank

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 = Sample result qualified as not detected at the reporting limit due to presence in an associated blank

< = Not detected above the reported sample detection limit

**TABLE 7**
**THIRD QUARTER SEPTEMBER 2016**
**GROUNDWATER MONITORING RESULTS**

| Groundwater Treatment Plant | |
|---|---|
| **Parameters** | **Influent** |
| | **09/28/16** |
| **Mercury (mg/L)** | 0.0481 |
| **Chloride (mg/L)** | 360 |
| **Sulfate (mg/L)** | 37 |
| **Alkalinity (mg/L as $CaCO_3$)** | 130 |
| **Specific Conductance (µS/cm @ 25°C)** | 1,512 |
| **pH (Standard Units)** | 7.59 |
| **Temperature (Degrees Celcius)** | 14.1 |
| **Salinity (g/L)** | 0.78 |
| **Turbidity (field) (NTU)** | 1.0 |
| **Dissolved Oxygen (mg/L)** | 4.3 |
| **Iron (mg/L)** | 0.03 J |
| **Manganese (mg/L)** | 0.056 |
| **Sodium (mg/L)** | 190 |
| ***VOCs*** | |
| **Acetone (µg/L)** | < 20 |
| **Chloroform (µg/L)** | 1.4 J |
| **Carbon Tetrachloride - SW8011M (µg/L)** | 0.238 |
| **Benzene (µg/L)** | < 2 |
| **Toluene (µg/L)** | < 3 |
| **Ethylbenzene (µg/L)** | < 2 |
| **Carbon Disulfide (µg/L)** | 1.5 J |
| **o-Xylene (µg/L)** | < 4 |
| **m,p-Xylene (µg/L)** | < 4 |
| **Methyltertiarybutylether (µg/L)** | < 4 |
| **Trichloroethene (µg/L)** | 1.2 J |
| **1,1-Dichloroethene (µg/L)** | < 2 |
| **Dibromochloromethane (µg/L)** | < 2 |
| **Tetrachloroethene (µg/L)** | < 2 |
| **Bromodichloromethane (µg/L)** | < 2 |
| **Bromoform (µg/L)** | < 4 |
| **1,1,1-Trichloroethane (µg/L)** | < 2 |
| **1,1,2-Trichloroethane (µg/L)** | < 3 |
| **cis-1,2-Dichlorethene (µg/L)** | < 2 |
| **Chloroethane (µg/L)** | < 4 |
| **Chloromethane (µg/L)** | 2 U |
| **Bromomethane (µg/L)** | 1 U |
| **Dichlorodifluoromethane (µg/L)** | < 8 |
| **Chloropicrin - SW8011M (µg/L)** | 3,250 |

Abbreviations:

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

U = Sample result qualified as not detected at the reporting limit due to presence in an associated blank

< = Not detected above the reported sample detection limit

**TABLE 8**
**THIRD QUARTER SEPTEMBER 2016**
**GROUNDWATER MONITORING RESULTS**

| Trip Blanks | | | | | | |
|---|---|---|---|---|---|---|
| **Parameters** | **QCBT (983)** | **QCBT (984)** | **QCBT (986)** | **QCBT (988)** | **QCBT (991)** | **QCBT (99A)** |
| | **09/26/16** | **09/28/16** | **09/27/16** | **09/27/16** | **09/28/16** | **09/26/16** |
| ***VOCs*** | | | | | | |
| **Acetone (µg/L)** | 1.5 J | 1.5 J | 1.6 J | NA | NA | NA |
| **Chloroform (µg/L)** | < 0.75 | < 0.75 | < 0.75 | NA | NA | NA |
| **Carbon Tetrachloride (µg/L)** | < 0.5 | < 0.5 | < 0.5 | < 0.102 | < 0.103 | NA |
| **Benzene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | NA | NA | NA |
| **Toluene (µg/L)** | < 0.75 | < 0.75 | < 0.75 | NA | NA | NA |
| **Ethylbenzene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | NA | NA | NA |
| **Carbon Disulfide (µg/L)** | < 1 | < 1 | < 1 | NA | NA | NA |
| **o-Xylene (µg/L)** | < 1 | < 1 | < 1 | NA | NA | NA |
| **m,p-Xylene (µg/L)** | < 1 | < 1 | < 1 | NA | NA | NA |
| **Methyltertiarybutylether (µg/L)** | < 1 | < 1 | < 1 | NA | NA | NA |
| **Trichloroethene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | NA | NA | NA |
| **1,1-Dichloroethene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | NA | NA | NA |
| **Dibromochloromethane (µg/L)** | < 0.5 | < 0.5 | < 0.5 | NA | NA | NA |
| **Tetrachloroethene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | NA | NA | NA |
| **Bromodichloromethane (µg/L)** | < 0.5 | < 0.5 | < 0.5 | NA | NA | NA |
| **Bromoform (µg/L)** | < 1 | < 1 | < 1 | NA | NA | NA |
| **1,1,1-Trichloroethane (µg/L)** | < 0.5 | < 0.5 | < 0.5 | NA | NA | NA |
| **1,1,2-Trichloroethane (µg/L)** | < 0.75 | < 0.75 | < 0.75 | NA | NA | NA |
| **cis-1,2-Dichlorethene (µg/L)** | < 0.5 | < 0.5 | < 0.5 | NA | NA | NA |
| **Chloroethane (µg/L)** | < 1 | < 1 | < 1 | NA | NA | NA |
| **Chloromethane (µg/L)** | 0.2 J | 0.24 J | 0.21 J | NA | NA | NA |
| **Bromomethane (µg/L)** | 1 U | 1 U | < 1 | NA | NA | NA |
| **Dichlorodifluoromethane (µg/L)** | < 2 | < 2 | < 2 | NA | NA | NA |
| **Chloropicrin - SW8011M (µg/L)** | NA | NA | NA | < 0.203 | < 0.206 | < 0.205 |

Abbreviations:

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

U = Sample result qualified as not detected at the reporting limit due to presence in an associated blank

NA = Parameter was not analyzed

< = Not detected above the reported sample detection limit