ANNUAL GROUNDWATER MONITORING REPORT
DULIN RUBBLE LANDFILL
23310 RICAUDS BRANCH ROAD
KENT COUNTY, MARYLAND
JANUARY TO DECEMBER 2019

MARCH 2020

Prepared For:

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Table of Contents

Table of Contents Continued

LIST OF FIGURES

Figure

LIST OF TABLES

Table

LIST OF APPENDICES

Appendix

1.0 SUMMARY

During the period covered in this report (January 1, 2019 through December 31, 2019), Earth Data Incorporated (Earth Data) performed on-site monitoring and related activities at the Dulin Rubble Landfill located on Ricauds Branch Road in Kent County, Maryland (Figure 1). Activities included collecting groundwater samples from five on-site monitoring wells for laboratory analysis on February 25 and August 26, 2019. Additionally, four gas monitoring wells, eight soil vapor points and three gas vents were sampled on a quarterly basis on February 25, May 20, August 26 and November 18, 2019. A site map showing the location of the monitoring wells and gas monitoring points are shown in Figures 2 and 3.

Results of the February and August 2019 groundwater sampling at the Dulin Rubble Landfill were compared against groundwater standards based on Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL), EPA Secondary Drinking Water Regulation (SMCL), and/or Maryland Department of the Environment (MDE) Groundwater Standards for Type I/II Aquifers. The groundwater comparison numbers used in this report are from the EPA National Primary Drinking Water Regulations published in May 2009 and/or the MDE Cleanup Standards for Soil and Groundwater October 2018 Interim Final Guidance.

Prior to sampling, each groundwater monitoring well was gauged with an oil/water interface probe to determine the depth to the water-table and the possible presence of an immiscible substance on the surface of the groundwater. The groundwater samples were sent to an EPA-approved laboratory for Volatile Organic Compounds (VOCs), Total Metals and Indicator Parameter analysis. Results of the February and August 2019 rounds of groundwater sampling at the Dulin Rubble Landfill showed no detectable concentrations of VOCs in any of the groundwater samples collected (Appendix E). Nitrate-nitrogen levels were detected at or above the MCL in monitoring well MW-1 in February and August 2019 and MW-4 in February 2019 and MW-2 in August 2019. Manganese levels were above the Secondary Maximum Concentration Level (SMCL) in monitoring wells MW-5 during February and August 2019 and in MW-4 only during August 2019. All other concentrations of total metals and indicator parameters were reported to be below MDE established clean-up levels. Overall, the analytical results suggest that the Dulin Rubble Landfill has had minimal impact on the shallow water-table aquifer beneath the site. These results are consistent with the data collected prior to this 2019 monitoring period.

In August 2006, Earth Data installed four gas monitoring wells at the Dulin Rubble Landfill. In May 2010, fourteen soil vapor monitoring points were installed on the landfill and adjacent properties, and currently eight soil vapor monitoring points remain at the site. As a result of the findings from the soil vapor point monitoring in 2010, three landfill gas vents were installed in the southeast corner of the landfill property to reduce the off-site movement of landfill gas. The gas well monitoring in 2019 detected low levels of combustible gas in SV-14 (4% LEL in August and November) and higher levels of combustible gas in vents V-1 (90% LEL in May, 100% LEL in November), V-2 (81% LEL in November), and V-3 (50% LEL in May, 63% LEL in August, and 100% LEL in November). Combustible gas was not detected in any other gas well or soil vapor monitoring point during this reporting period.

Results of semi-annual monitoring of groundwater at the Dulin Rubble Landfill since 1995 have shown that past operations at the site have had little or no impact on the area groundwater. No detectable VOCs or significant quantities of metals, other than a history of high levels of iron, have been found in the groundwater samples. Indicator parameter levels have returned to background levels since the close of the landfill in 1999. Earth Data recommends maintaining the frequency of groundwater monitoring on a biannual basis. Although significant reduction in off-site landfill gas concentrations have been realized since the installation of landfill vents in 2010, quarterly monitoring of the landfill gas wells and vapor points should continue until a clear trend is established.

2.0 BACKGROUND

The Dulin Rubble Landfill was operated by Kent County Department of Public Works (KCPW) from 1991 until 1999. Prior to its use as a rubble landfill, the 5-acre property was used as a sand and gravel borrow pit and an unpermitted rubble disposal area. The borrow pit was approximately 2.5 acres, with woodland occupying the remaining area of the property. After purchasing the property in 1990, Kent County erected a chain link fence around the entire perimeter of the property with a gated entrance on the south side. The existing rubble material present at the time of the purchase was pushed into one area and covered with clean fill material.

During the time that Kent County operated the site, waste material accepted at the Dulin Rubble Landfill included: earthen materials, vegetation, building materials, roofing materials, construction and demolition debris, paving materials, appliances, paper materials, metal, glass and carpet. The rubble was placed in the borrow pit at a depth no less than five feet above the seasonal high water-table. Four shallow groundwater monitoring wells (MW-1 through MW-4) were constructed around the rubble landfill in January 1992. An additional monitoring well (MW-5) was installed in October 1993. In 1999, the Dulin Rubble Landfill was closed and capped. From 1995 to 2005, the monitoring wells were sampled twice each year by the Kent County Department of Environmental Health for VOCs, Total Metals and Indicator Parameters analysis. In 2005, Earth Data was contracted by KCPW to assume the routine sampling at the landfill. During the current reporting period, the groundwater monitoring wells were sampled on February 25 and August 26, 2019.

In response to the letter received by Kent County from MDE dated May 19, 2006, requesting the development of a methane gas monitoring plan at the Dulin Rubble Landfill, Earth Data was contracted to install and sample gas monitoring wells at the site. In August 2006, Earth Data installed four gas monitoring wells at the Dulin Rubble Landfill in accordance with COMAR 26.04.07.03B(9) to monitor the generation and migration of methane gas. The gas monitoring wells have been sampled on a quarterly basis since their installation. In May 2010, fourteen soil gas vapor monitoring points were installed, and now eight soil vapor monitoring points remain at the site. In June 2010, three landfill gas vents were installed to alleviate the off-site movement of landfill gas. These monitoring points and vents have been incorporated into the

regular quarterly monitoring. During this reporting period, the gas monitoring wells, soil vapor points and gas vents were sampled on February 25, May 20, August 26, and November 18, 2019.

3.0 SITE DESCRIPTION

3.1 SITE LOCATION AND TOPOGRAPHY

The Dulin Rubble Landfill is located on Ricauds Branch Road on the north side of the intersection with Hynson Rogers Road approximately six miles southeast of Chestertown in Kent County, Maryland. Chestertown is located in south central Kent County, Maryland. Land use in the vicinity of Dulin Rubble Landfill is primarily agricultural.

The closest surface water to the Dulin Rubble Landfill property is the West Fork of Langford Creek, which lies approximately one-half mile southwest of the property. The Langford Creek is a tidal tributary of the Chester River. The Dulin Rubble Landfill is located on the Eastern Shore of Maryland, approximately six miles north of the Chester River, a major tidal tributary of the Chesapeake Bay. The Eastern Shore of Maryland is part of the Delmarva Peninsula, which is in the Atlantic Coastal-plain physiographic province. The coastal plain is underlain by layers of unconsolidated sediments (clays, silts and sands), which dip and thicken towards the southeast.

3.2 SITE GEOLOGY

The Pennsauken Formation, of Pleistocene or Pliocene age, comprises the surface sediments over much of the Delmarva Peninsula. At the Dulin Rubble Landfill, the Pennsauken Formation consists primarily of iron-stained sand and gravelly deposits. The total thickness of the Pennsauken Formation ranges from 20 to 40 feet in the vicinity of the landfill. The Paleocene-aged Aquia Formation, which underlies the Pennsauken Formation in much of Kent County, consists of layered sands approximately 60 feet thick (Drummond, 1998). The Aquia Formation is underlain by sands of the Hornerstown Formation (Paleocene) to a depth of approximately 170 feet. Beneath the Hornerstown sands lie the confining, clayey sands of the Severn Formation. In the vicinity of the landfill, the Severn Formation is 20 to 30 feet thick. Beneath the Severn Formation, lies the sands, silts and clays of the Mount Laurel Formation (Cretaceous aged) to a depth of approximately 240 feet below the ground surface. Cretaceous-age silts, sands and clays of the Matawan Formation underlie the Mount Laurel Formation to a depth of approximately 315 feet below the ground surface. Beneath the Matawan Formation lie sands and clays of the Magothy Formation to a depth of approximately 350 feet. The Cretaceous-aged Potomac Formation underlies the Magothy Formation. The Potomac Formation consists of

several confining clay units. Water-bearing sand layers occur between the clay layers to a depth of at least 1,500 feet below the ground surface, where the crystalline bedrock occurs.

Many water-supply wells, including the domestic wells near the landfill and some of the municipal wells for the Town of Chestertown, are screened in the unconfined water-table aquifer (Aquia Formation). Water-bearing sands may also be found in the confining Mount Laurel, Matawan and Magothy Formations, depending on location. Aquifers in the Potomac Formation have also been used for municipal water supply in Kent County.

4.0 LANDFILL MONITORING

4.1 GROUNDWATER MONITORING

Groundwater monitoring at the Dulin Rubble Landfill in Kent County, Maryland, has been performed in accordance with the specifications of the contract with the Kent County Department of Public Works (Project No. KCPW 06-01) and the conditions of the State of Maryland Discharge Permit No. 99-DP-2978.

On February 25, 2019 and August 26, 2019, water samples were collected from the five monitoring wells (MW-1, MW-2, MW-3, MW-4 and MW-5) at the Dulin Rubble Landfill for laboratory analysis. Each well was gauged with an oil/water interface probe to determine the depth to water and the possible presence of immiscible product on the water-table. After gauging, each well was purged of three volumes of water to ensure that the sample collected was representative of the water in the surrounding formation. The samples were placed into pre-labeled, laboratory-supplied sample containers and set on ice in a laboratory-supplied cooler. The samples were sent to an EPA-approved laboratory using an overnight courier service to be analyzed for VOCs (EPA Method 8260, and EPA Method 8011), Total Metals (EPA Method 200.8) and the following indicator parameters:

pH (SM4500-H+B-2011)
ammonia (SM4500-NH3-F-2011)
alkalinity (SM 2320B-11)
sulfate (EPA Method 300.0)
hardness (EPA Method 200.8)
total dissolved solids (SM2540C-2011)
turbidity (EPA Method 180.1)
nitrate (EPA Method 300.0)
chloride (EPA Method 300.0)
COD (SM5220D-2011)
specific conductance (SM2510B-2011)

The Earth Data field reports and well gauging reports for the February 25 and August 26, 2019 groundwater sampling were documented using a cloud based mobile application. Field reports and may be found in Appendix A, and well gauging reports may be found in Appendix B. Laboratory analytical reports for the February 25 and August 26, 2019 sampling event may be found in Appendix C.

4.2 LANDFILL GAS MONITORING

In August 2006, Earth Data installed four gas monitoring wells at the Dulin Rubble Landfill (Figure 2). In May 2010, fourteen soil vapor monitoring points were installed on the landfill and property adjacent to the southeast corner of the landfill, and now eight soil vapor monitoring points remain at the site (Figure 3). As a result of the findings from the soil vapor point monitoring, in 2010 three landfill gas vents were installed in the southeast corner of the landfill property to reduce the off-site movement of landfill gas.

On a quarterly basis during the current reporting period (February 25, May 20, August 26, and November 18, 2019), the gas monitoring network was sampled for combustible gas (methane) and oxygen levels. The points sampled this reporting period included: four gas monitoring wells (GW-1, GW-2, GW-3 and GW-4), eight soil vapor monitoring points (SV-1, SV-2, SV-3, SV-4, SV-5, SV-12, SV-13 and SV-14), and three gas vents (V-1, V-2, and V-3).

The samples were analyzed in the field with a QRAE® Gas Surveyor portable gas analyzer. Prior to arriving on site, the portable gas analyzer was calibrated with a 50% lower explosive limit precision gas mixture. The sample hose was connected to the valve at the top of the well and the pump in the meter ran until the reading stabilized. The combustible gas and oxygen concentrations were then recorded in the field. Combustible gas was measured as the percent of the lower explosive limit (LEL), whereas oxygen was measured in total percent. After recording the data, the valve was closed, and the sample hose disconnected. Earth Data field reports for the gas monitoring may be found in Appendix D.

5.0 AQUIFER PROPERTIES

In the vicinity of the Dulin Rubble Landfill, the Pennsauken Formation, the Aquia Formation and the Hornerstown Formation are hydrologically connected. The first confining layer (Severn Formation) occurs approximately 200 feet below ground surface (bgs). The groundwater monitoring wells installed at the landfill are all screened in the unconfined aquifer across the Pennsauken Formation and Aquia Formation contact. During the 2019 monitoring events, the depth to water from below the top of casing measured in the monitoring wells varied from approximately 6.43 feet to 43.49 feet, depending on well location. The top of the casing for most of the monitoring wells averaged approximately 3.0 feet above the ground surface. Based on the gauging data collected at the landfill and the topographic elevation of the well locations, the approximate water-table elevation appears to occur between 29.92 and 35.46 feet above mean sea level (msl), depending on the well location. The water-table elevation has remained relatively consistent since Earth Data began monitoring the site in August 2005. The water-table elevation occurs above the screen interval for all monitoring wells, except for MW-5.

Using the monitoring well gauging data collected during the February 25 and August 26, 2019 monitoring events and the ground surface elevations at the monitoring well locations, it appears that the groundwater flows from northeast to southwest across the site, toward a tributary of Langford Creek (Figures 4 and 5). Gauging data collected during previous sampling events indicated a similar groundwater flow direction at the site.

6.0 RESULTS

6.1 HISTORICAL WATER QUALITY

The monitoring wells at the Dulin Rubble Landfill have been sampled semi-annually for laboratory analysis since 1995. Up-gradient well MW-3, however, was not sampled from June 2002 until the February 2006 sampling event, causing a data gap. During the 1995 to August 26, 2019 period, laboratory analytical results have shown no significant quantities of VOCs or metals (except for iron and manganese) in the groundwater samples collected at the site (Appendix E). Historical analysis of iron concentrations shows an exceedance of the cleanup standard (1.4 mg/L) on numerous occasions from 1995 through 2014. Since 2014, iron concentrations have been reported to be below the cleanup standard of 1.4 mg/L or not detected among all monitoring wells. Manganese concentrations in MW-4 and MW-5 have historically exceeded the cleanup standard of 0.043 mg/L since analysis began in 2013.

Analysis of the indicator parameters has shown elevated concentrations of nitrate-nitrogen (above 10 mg/L MCL) in each well during at least one sampling event in the past twenty years (Appendix E). In MW-4, the nitrate-nitrogen levels were consistently above the MCL from February 2004 to August 2012. Also, the nitrate-nitrogen concentrations for MW-1 are below the MCL from 1995 to 2015 but show an increasing trend and become above the MCL from 2015 forward. The presence of nitrate-nitrogen in the water-table aquifer may be attributed to farming practices on the properties adjacent to the landfill and is probably not an artifact of the landfill. Nitrate-nitrogen is a commonly used agricultural fertilizer and elevated nitrate-nitrogen concentrations are found in the water-table aquifer throughout the Delmarva Peninsula.

The secondary maximum contaminant level for total dissolved solids (TDS) (500 mg/L) was exceeded in MW-5 during two sampling events (June 4, 1996 and October 6, 1997). Consequently, the concentrations of TDS in groundwater at the Dulin Rubble Landfill continue to be investigated further using statistical and graphical techniques to determine the potential influence of the rubble landfill on the area groundwater. The results of these analyses are discussed in Section 7.0.

The pH measured in samples collected from all the monitoring wells over the past 20 years has generally been slightly acidic (pH of 4.4 to 7.4). A pH in this range is typical for the water-table aquifer in this area.

6.2 FEBRUARY AND AUGUST 2019 WATER QUALITY

On February 25 and August 26, 2019, Earth Data representatives collected groundwater samples from monitoring wells MW-1, MW-2, MW-3, MW-4 and MW-5 at the Dulin Rubble Landfill. Samples were analyzed for VOCs, total metals and indicator parameters. Analytical results have shown no significant quantities of VOCs in any of the groundwater samples collected at the site over the previous 20 years. The analytical results from the two recent sampling events in 2019 reported some VOC, metal, and indicator parameters with a laboratory reporting limit (RL) that exceeds the MDE Table I and Table II PQL values. However, the laboratory reporting limits and the method detection limits (MDL) are significantly below the appropriate groundwater standard utilized for comparison of the results. The following tables summarize the PQL exceedances for this 2019 reporting period with the comparable groundwater standards:

VOC Parameters (Table I)	MDE PQL (ppb)	Laboratory Reporting Limit (RL) (ug/L)	Laboratory Limit of Detection (MDL) (ug/L)	Groundwater Standard
Acetone	5.0	10	5	1400 ug/L [3]
Acrylonitrile	5.0	10	5	N/A
Bromoform	1.0	5	2.5	80 ug/L [3]
2-Butanone (MEK)	5.0	10	5	560 ug/L [3]
Carbon Disulfide	1.0	10	5	81 ug/L [3]
Iodomethane	1.0	20	10	N/A
Trichlorofluoromethane	1.0	5	2.5	N/A

[1] Value from EPA Maximum Contaminant Level
[2] Value from EPA Secondary Drinking Water Standard
[3] Value from MDE Cleanup Standard for Type I/II Aquifers

Metals and Indicator Parameters (Table II)	MDE PQL (ppm)	Laboratory Reporting Limit (RL) (mg/L)	Laboratory Limit of Detection (MDL) (mg/L)	Groundwater Standard
Antimony	0.002	0.005	0.00072	0.006 mg/L [1,3]
Chloride*	0.39	5	5	250 mg/L [2]
Iron	0.005	0.1	0.021	1.4 mg/L [2]
Sulfate	0.38	5	1.6	250 mg/L [2]
Turbidity*	0.11 (NTU)	0.5 (NTU)	0.5 (NTU)	5 NTU [1]
Zinc*	0.01	0.2	0.2	0.6 mg/L [3]

[1] Value from EPA Maximum Contaminant Level
[2] Value from EPA Secondary Drinking Water Standard
[3] Value from MDE Cleanup Standard for Type I/II Aquifers
* February 2019 Analysis Only

Based on a discussion of results with the laboratory, they indicated on February 11, 2020 that the future VOC reporting limits can be reduced to match the MDE PQL Table I.

Total Metals

Analytical results of the groundwater samples collected from the monitoring wells during the February 25 and August 26, 2019 sampling events showed no detections of arsenic, cadmium, lead, mercury, selenium, silver, and thallium. Antimony was not detected above the RL of 0.005 mg/L in any of the samples in 2019. Iron was not detected above the laboratory RL of 0.1 mg/L in any of the samples on February 25, however iron was detected in trace amounts on August 26 in MW-1, MW-3, MW-4, and MW-5, and was not detected above the RL in MW-2. The remaining metals analyzed during this reporting period (barium, beryllium, calcium, chromium, cobalt, copper, magnesium, nickel, potassium, sodium, vanadium, and zinc) showed to be either not detected or had detectable concentrations below the respective groundwater standard across all sampled wells. The exception was manganese which reported concentrations above the groundwater standard of 0.043 mg/L on February 25 from MW-5 (0.0647 mg/L), and on August 26 from MW-4 (0.137 mg/L) and MW-5 (0.0591 mg/L). Tables 1 and 2 show a summary of the metal analysis for this reporting period.

Indicator Parameters

No significant changes were noted in any of the indicator parameters tested during this round of sampling. Nitrate-nitrogen has an MCL of 10 mg/L. On February 25, the nitrate-nitrogen concentrations were above the MCL in MW-1 (16 mg/L) and MW-4 (10 mg/L). On the August 26 sampling, the nitrate-nitrogen concentrations were above the MCL in MW-1 (18 mg/L) and MW-2 (11 mg/L). As discussed previously, the elevated nitrate-nitrogen concentrations at the site are most likely associated with the use of fertilizers on the farmland adjacent to landfill property. The pH levels measured in the water samples were comparable to previous measurements and ranged from 5.4 to 6.0 this monitoring period. This is typical for the water-table aquifer in this area.

During the two 2019 sampling events, the total dissolved solid concentrations found in the water samples collected from the five monitoring wells ranged from 46 mg/L (MW-5) to 130 mg/L (MW-1) and remain below the SMCL of 500 mg/L. Sulfate was detected in the samples

collected from MW-3 at concentrations 17 mg/L (February 25) and 12 mg/L (August 26). Sulfate was not detected above the laboratory RL of 5 mg/L in all other sampled wells this reporting period. These concentrations remain well below the SMCL of 250 mg/L. TDS and sulfate concentrations were found to be within the range of background levels in all the downgradient (compliance) monitoring wells.

During this monitoring period, turbidity was found at levels below the EPA recommendation of 5 NTU for filtered drinking water. On February 25, the turbidity of sampled wells ranged from non-detect above the laboratory RL (<0.5 NTU) to 1.6 NTU. On August 26, the turbidity ranged from 0.57 NTU to 2.7 NTU across the sampled wells. Chloride was detected below the SMCL of 250 mg/L on all wells. On February 25, chloride ranged from non-detect above the laboratory RL (<5 mg/L) to 14 mg/L. On August 26, chloride ranged from 4.5J mg/L to 15 mg/L across the sampled wells. Tables 3 and 4 summarize the indicator parameter concentrations in water samples collected during the February 25 and August 26, 2019 sampling events. Appendix E shows a summary over time of the VOCs, metals and indicator parameter concentrations in each monitoring well.

6.3 2019 LANDFILL GAS QUALITY

Four gas wells at the Dulin Rubble Landfill (GW-1, GW-2, GW-3, and GW-4) were sampled for combustible gas (methane) and oxygen on a quarterly basis on February 25, May 20, August 26 and November 18, 2019. Additionally, eight soil vapor monitoring points (SV-1, SV-2, SV-3, SV-4, SV-5, SV-12, SV-13 and SV-14), and three gas well vents (V-1, V-2, and V-3) were sampled during each of these sampling events.

Historically, combustible gas measurements from GW-3 have been high; however, since the installation of three gas vents near this well, combustible gas levels have decreased in GW-3 to 0% LEL. No detectable concentrations of combustible gases were found in any of the gas wells in 2019. The three landfill gas vents were installed in June 2010 and have been reporting detectable concentrations of combustible gas since installation. During this 2019 monitoring period, combustible gas was found in: V-1 in May (90% LEL) and November (100% LEL), V-2 in November (81% LEL), and in V-3 in May (50% LEL), August (63% LEL), and November (100% LEL). The gas vent monitoring results are comparable to historical data. Table 5 shows a

summary of the methane gas and oxygen concentrations for each sampling event since the instillation of the gas monitoring wells and gas vents.

During each sampling event, combustible gas measurements were also collected from seven soil vapor monitoring points in the southeast corner of the landfill near GW-3. Detectable concentrations of combustible gas were found in SV-14 during the August 26, 2019 (4% LEL) and November 18, 2019 (4% LEL) sampling events. No combustible gases were found in any of the other soil vapor points this 2019 monitoring period. Table 6 shows a summary of the methane gas and oxygen concentrations for each soil vapor point since installation.

Oxygen concentrations in the gas wells ranged from 6.6 to 19.5 percent, depending on the well location and sampling date. Oxygen concentrations in the soil vapor points ranged from 11.2 to 20.9 percent, depending on the vapor point location and sampling date. Oxygen levels in the gas vents ranged from 1.2 to 20.9 percent, depending on the vent location and sampling date. Figures 6, 7, 8, and 9 show the combustible gas and oxygen levels measured in the gas monitoring wells, soil vapor monitoring points and gas vents during the February 25, May 20, August 26 and November 18, 2019 sampling events, respectively.

7.0 STATISTICAL ANALYSIS

Due to the absence of significant concentrations of VOCs, metals and most indicator parameters at the Dulin Rubble Landfill, a statistical analysis was performed on only one analyte: total dissolved solids (TDS). Using historical groundwater quality data for TDS, a statistical analysis was performed using ChemStat statistical software.

Before any data can be analyzed, the integrity and distribution of the data should be ascertained. Because the analytical data prior to 2005 were provided by the State of Maryland, laboratory and quality control data were unavailable. There was little information available to document data validity; however, for the purpose of this analysis, all data were accepted as is. Because up gradient well MW-3 was not sampled between June 2002 and August 2005, no data could be statistically evaluated to establish trends in compliance between up gradient and down-gradient water quality differences during this period. This is not to say that the data were not reviewed and exceedances of quality standards duly noted where appropriate. The comparison of up gradient and downgradient water quality trends allows potential landfill impacts to be separated from regional trends. Three rounds of water samples were collected during May 1995. To avoid a time-weighted problem, if all three sample results were used independently, the results for May 1995 were averaged and considered as a single sample round.

Because the sample size for each parameter for each well was relatively small (approximately 40 sampling events), non-parametric statistical tests were used to analyze the data. Non-parametric procedures are preferred for analysis of the Dulin Rubble Landfill data because they are:

1. free from normal distribution assumptions (which cannot be ascertained with certainty for small sample sets);
2. resistant to effects of outliers; and
3. usable when censored (i.e., less than detection values) data are present.

The EPA addendum describes the Kruskal-Wallis test when three or more well groups are being compared. However, the Wilcoxon Rank-Sum procedure (also known as the Mann-Whitney U Test) is recommended for two-group comparisons, such as the comparison of an individual compliance well to background well data.

The Mann-Kendall trend analysis test (Gilbert 1987) is another non-parametric test for determining trends in data over time. The test supports multiple observations per time period. Using this test, a downward or upward trend in the concentration of a particular parameter for the entire history of sampling can be identified.

Total Dissolved Solids, TDS

Based on the application of the Wilcoxon Rank-Sum test, there was a significant difference between background well MW-3 and compliance well MW-5 for TDS between 1995 and 2012 (Figure 10). The highest dissolved solids concentration in MW-5 was approximately 892 mg/L during the June 1996 sampling event. Since that time, the concentration of TDS in well MW-5 has decreased and remained below the background levels in MW-3. For the entire monitoring period (1995 to 2019), a statistically significant difference between background well MW-3 and compliance well MW-4 was noted for TDS. Historical dissolved solid concentrations at MW-4 has showed indication of statistical significance. The concentration of TDS in MW-4 during the past few sampling events has also decreased to levels comparable to background concentrations at MW-3. These values suggest that the rubble landfill, or activities around the landfill such as washing out concrete trucks or road salting, may have had an impact on groundwater quality at compliance wells MW-4 and MW-5 in the past. When the Wilcoxon Rank-Sum test was used to compare the background well MW-3 with the compliance wells MW-1, MW-2, and MW-5 for TDS, there was no statistical significance at the 1% level.

The results of the Mann-Kendall trend analysis test indicate a downward trend in background well MW-3. An upward trend is indicated in MW-1, and a downward trend is indicated in MW-2 and MW-5. No evidence of a trend up or down is indicated for MW-4. The statistical analysis report may be found in Appendix F.

8.0 CONCLUSIONS

Results of the groundwater monitoring at the Dulin Rubble Landfill in Kent County, Maryland, indicate that the landfill, which was closed in 1999, has not significantly degraded the groundwater quality at the site. Groundwater at the rubble landfill has been routinely monitored since 1995. Historical and current analysis of the groundwater at the site has shown no significant quantities of VOCs, metals and most indicator parameters. TDS concentrations above background levels in monitoring wells MW-4 and MW-5 during the period between 1995 and 2006 can be attributed to landfill activities. Statistical analysis of historic TDS data collected at the site from compliance wells MW-4 and MW-5 supports this conclusion. The concentrations of TDS found in the compliance wells during this monitoring period and over the past 5 years have not only been well below the MDE cleanup level but are nearly equivalent to background levels found in MW-3. In addition, it should be noted that the decreasing trend in the concentration of TDS in the compliance wells MW-4 and MW-5 has occurred since the landfill was closed, as would be anticipated. Concentrations of nitrate-nitrogen above the EPA MCL in three groundwater monitoring wells (MW-1, MW-2, and MW-4) during this monitoring period may be attributed to the use of agricultural fertilizers on the properties adjacent to the landfill.

Based on the most recent results and despite the absence of significant concentrations of VOCs, metals and most indicator parameters in the groundwater samples collected at the Dulin Rubble Landfill over the past 20 years, and the established decreasing trend in the concentration of total dissolved solids to background levels, Earth Data recommends maintaining the frequency of the groundwater sampling and analysis portion of the monitoring program of semi-annual sample collection. The quarterly gas monitoring portion of the landfill monitoring program should also remain unchanged for the time being.

Since the installation of landfill gas monitoring wells in August 2006, one gas monitoring well, GW-3, has consistently shown combustible gas (methane) levels at 100% LEL through May 2010. However, since the installation of the gas vents adjacent to GW-3 in June 2010, the gas well monitoring has shown a reduction in combustible gas concentrations in GW-3 to 0% LEL, indicating that the vents continue to be effective in reducing the off-site migration of landfill gas. Continued monitoring of the landfill gas wells will provide additional data to determine the efficiency of the landfill vents in reducing or preventing further offsite movement of the landfill gases.

9.0 LIMITATIONS

The findings and conclusions presented in this report are the result of both field work and data analysis performed by Earth Data Incorporated and the analysis and interpretation of data collected by others as of this date. Earth Data makes no warranties or guarantees as to the accuracy or completeness of information obtained from or compiled by others. As additional data may become available, or the regulatory frameworks may change, the conclusions presented herein may change. Earth Data collected groundwater samples from only five monitoring wells on the property. Consequently, there may be soil or groundwater conditions on the property that were not disclosed by our investigation.

This report has been prepared in accordance with generally accepted practices and the level of care ordinarily exercised by members of our profession for the exclusive use of the Kent County Maryland Department of Public Works and their representatives. No other warranty, expressed or implied, is made.

FIGURES

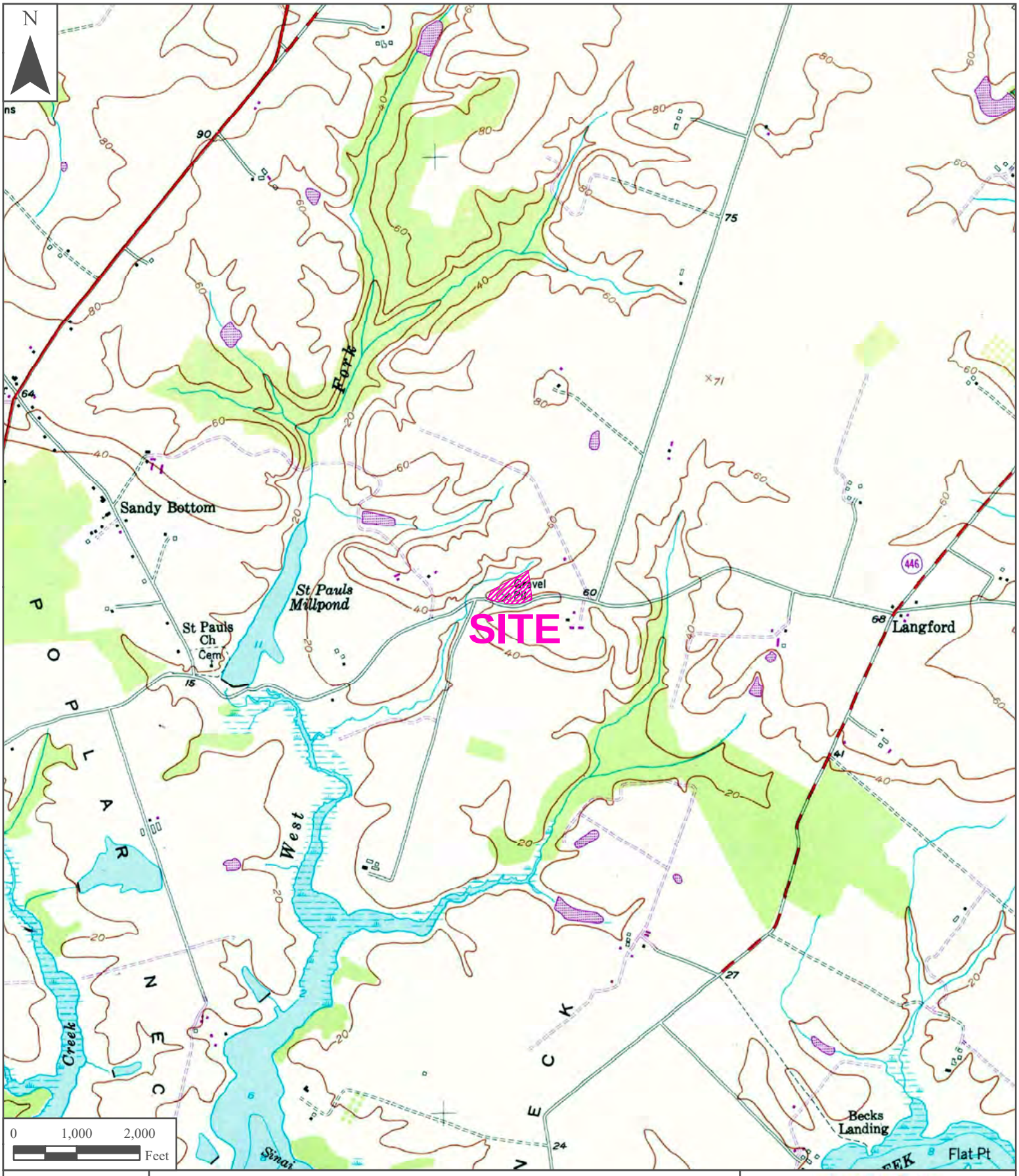

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Figure 1	Location of Dulin Rubble Landfill Kent County, Maryland			EarthData INCORPORATED • Water Resources • Geospatial Services • Solutions for Tomorrow. Today.		
	Date: 01/27/2020	Project Number: 4697E	Drawn By: Shawn Stabile	Rev #	Date	Description
					01/27/2019	
	Scale: As Shown	Original Print Size: 8.5"X11"	Source: USGS Rock Hall			

Explanation

MW-10D Groundwater Montoring Well

GW-1 Gas Monitoring Wells

Figure

2

Location of Wells and Other Pertinant Features at Dulin Rubble Landfill

Kent County, Maryland

Date:	01/27/2020	Project Number:	4697E	Drawn By:	Shawn Stabile
Scale:	As Shown	Original Print Size:	11"X17"	Source:	iMAP 2016

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Rev#	Date	Description
	01/27/2020	

Explanation

- SV-1 — Soil Vapor Point
- A — Landfill Gas Vent

Figure

3

Location of Gas Vents and Soil Vapor Points at Dulin Rubble Landfill

Kent County, Maryland

Date:	01/27/2020	Project Number:	4697E	Drawn By:	Shawn Stabile
Scale:	As Shown	Original Print Size:	11"X17"	Source:	iMAP 2016

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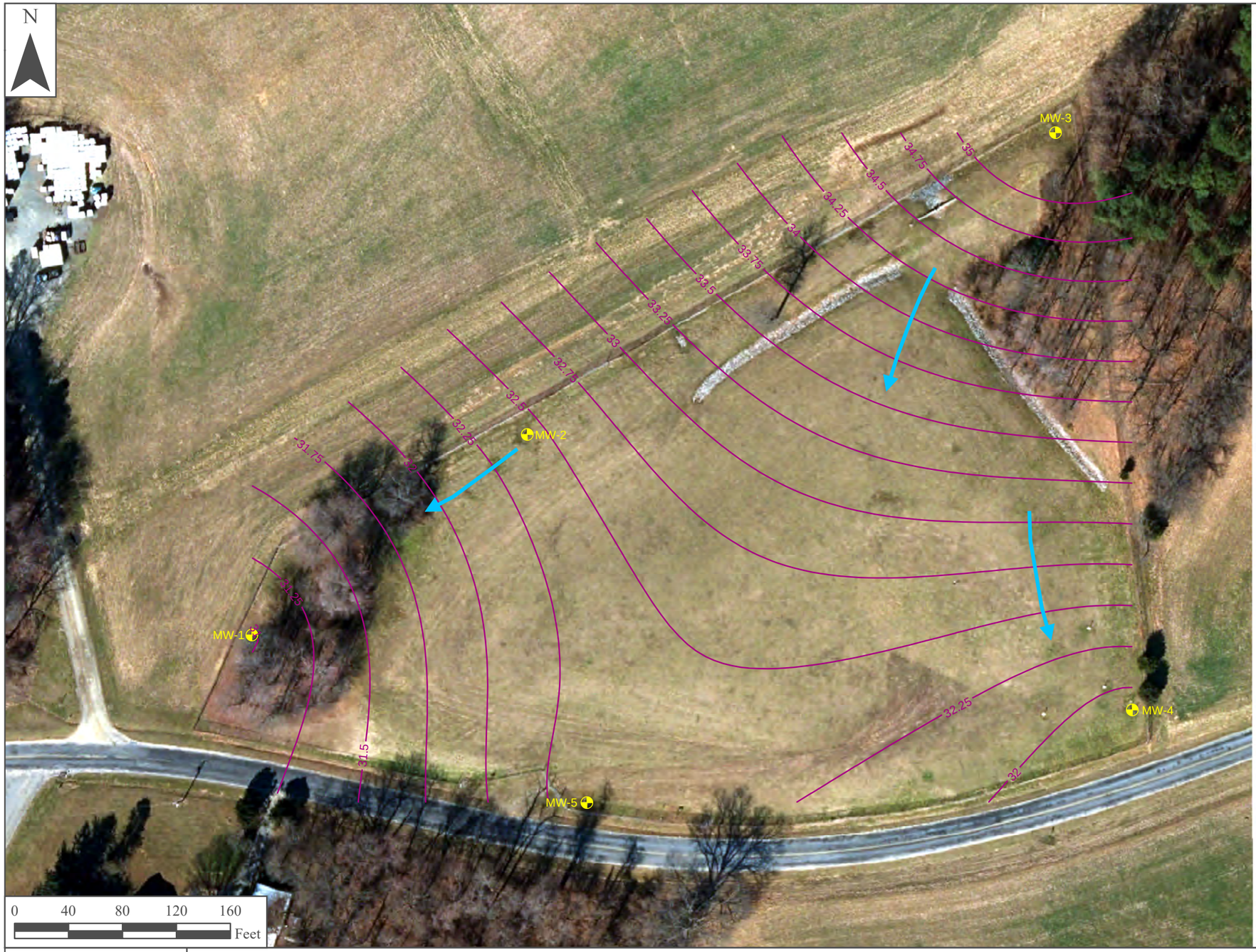
Rev#	Date	Description
	01/27/2020	



Explanation

- MW-10D — Groundwater Montoring Well
- 24 — Water Contour Measured 02/25/2019 (FT. MSL)
- Direction of Groundwater Flow

Figure

4

Water Table Contours for February 25, 2019 at Dulin Rubble Landfill

Kent County, Maryland

Date:	01/27/2020	Project Number:	4697E	Drawn By:	Shawn Stabile
Scale:	As Shown	Original Print Size:	11"X17"	Source:	iMAP 2016

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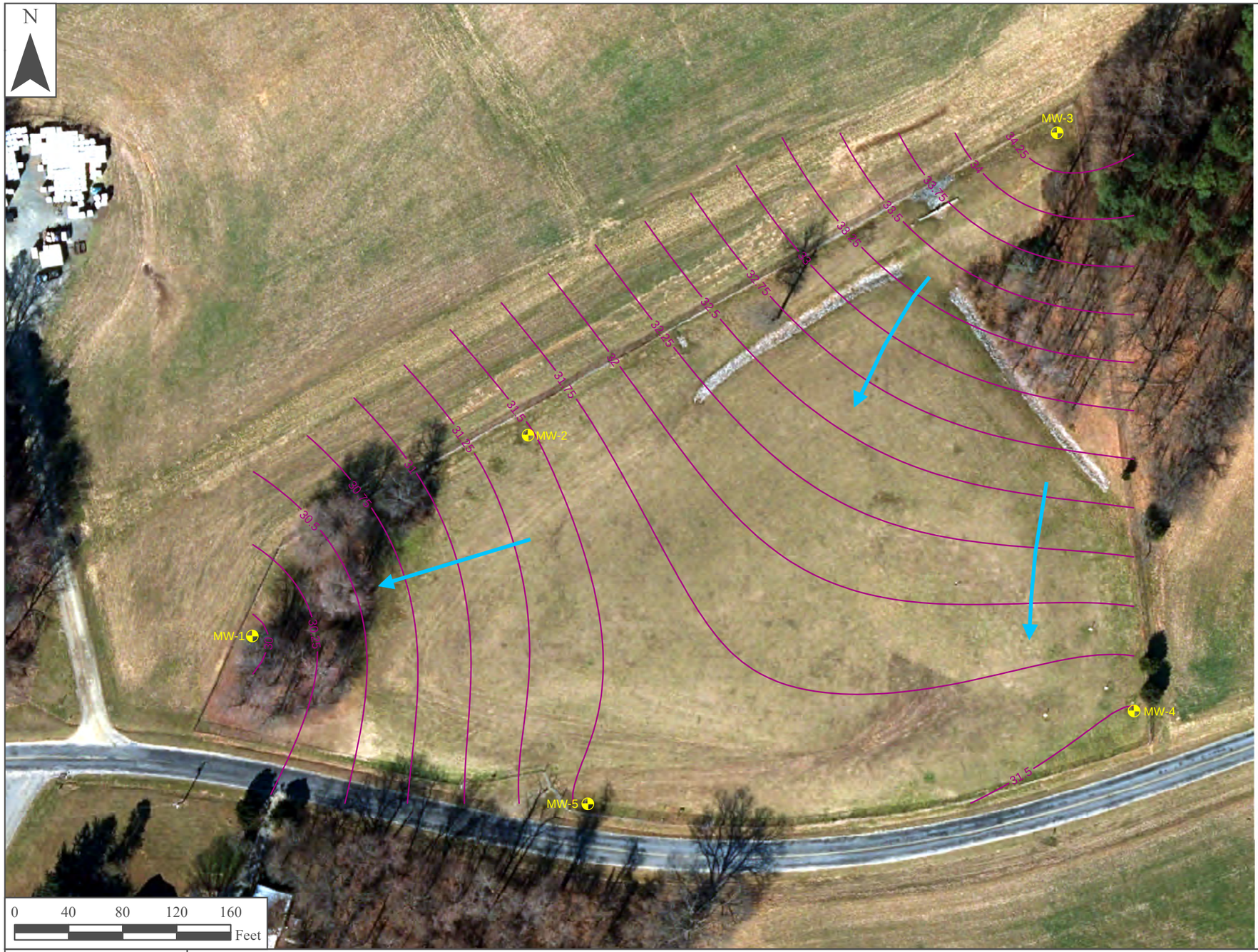
Rev#	Date	Description
	01/27/2020	



Explanation

- MW-10D — Groundwater Montoring Well
- 24 — Water Contour Measured 08/26/2019 (FT. MSL)
- Direction of Groundwater Flow

Figure

5

Water Table Contours for August 26, 2019 at Dulin Rubble Landfill

Kent County, Maryland

Date:	01/27/2020	Project Number:	4697E	Drawn By:	Shawn Stabile
Scale:	As Shown	Original Print Size:	11"X17"	Source:	iMAP 2016

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Rev#	Date	Description
	01/27/2020	

SV-1 Soil Vapor

POINT ID	LEL(%)	O_2(%)
SV-1	0	20.9
SV-2	0	15.2
SV-3	0	16.9
SV-4	0	18.2
SV-5	0	20.9
SV-12	0	20.4
SV-13	0	15.6
SV-14	0	17.6
Feb. 25, 2019		

GW-1 Gas Monitoring Well

WELL ID	LEL(%)	O_2(%)
GW-1	0	18.7
GW-2	0	16.2
GW-3	0	18.6
GW-4	0	13.1
Feb. 25, 2019		

A Gas Vent

VENT ID	LEL(%)	O_2(%)
V-1	0	18.2
V-2	0	20.9
V-3	0	20.9
Feb. 25, 2019		

NS = Not Sampled
LEL = Lower Explosive Limit

Figure

6

Combustible Gas and Oxygen Levels in Gas Monitoring Wellls for February 25, 2019 at Dulin Rubble Landfill

Kent County, Maryland

Date:	01/27/2020	Project Number:	4697E	Drawn By:	Shawn Stabile
Scale:	As Shown	Original Print Size:	11"X17"	Source:	iMAP 2016

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Rev#	Date	Description
	01/27/2020	

SV-1 Soil Vapor

POINT ID	LEL(%)	O_2(%)
SV-1	0	20.2
SV-2	0	16.0
SV-3	0	17.2
SV-4	0	17.3
SV-5	0	16.7
SV-12	0	11.2
SV-13	0	13.2
SV-14	0	16.0
May 20, 2019		

GW-1 Gas Monitoring Well

WELL ID	LEL(%)	O_2(%)
GW-1	0	12.8
GW-2	0	14.2
GW-3	0	19.5
GW-4	0	13.1
May 20, 2019		

A Gas Vent

VENT ID	LEL(%)	O_2(%)
V-1	90	6.5
V-2	0	14.5
V-3	50	1.2
May 20, 2019		

NS = Not Sampled
LEL = Lower Explosive Limit

Figure

7

Combustible Gas and Oxygen Levels in Gas Monitoring Wellls for May 20, 2019 at Dulin Rubble Landfill

Kent County, Maryland

Date:	01/27/2020	Project Number:	4697E	Drawn By:	Shawn Stabile
Scale:	As Shown	Original Print Size:	11"X17"	Source:	iMAP 2016

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Rev#	Date	Description
	01/27/2020	

SV-1 Soil Vapor

POINT ID	LEL(%)	O_2(%)
SV-1	0	20.2
SV-2	0	14.8
SV-3	0	15.4
SV-4	0	14.7
SV-5	0	14.2
SV-12	0	13.4
SV-13	0	15.3
SV-14	4	12.7
August 26, 2019		

GW-1 Gas Monitoring Well

WELL ID	LEL(%)	O_2(%)
GW-1	0	6.7
GW-2	0	6.6
GW-3	0	16.3
GW-4	0	9.3
August 26, 2019		

A Gas Vent

VENT ID	LEL(%)	O_2(%)
V-1	0	20.0
V-2	0	11.9
V-3	63	0
August 26, 2019		

NS = Not Sampled
LEL = Lower Explosive Limit

Figure

8

Combustible Gas and Oxygen Levels in Gas Monitoring Wellls for August 26, 2019 at Dulin Rubble Landfill

Kent County, Maryland

Date:	01/27/2020	Project Number:	4697E	Drawn By:	Shawn Stabile
Scale:	As Shown	Original Print Size:	11"X17"	Source:	iMAP 2016

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Rev#	Date	Description
	01/27/2020	

SV-1 Soil Vapor

POINT ID	LEL(%)	O_2(%)
SV-1	0	16.1
SV-2	0	15.4
SV-3	0	17.1
SV-4	0	16.8
SV-5	0	16.5
SV-12	0	13.1
SV-13	0	16.8
SV-14	4	16.0
November 18, 2019		

GW-1 Gas Monitoring Well

WELL ID	LEL(%)	O_2(%)
GW-1	0	18.7
GW-2	0	12.9
GW-3	0	17.4
GW-4	0	14.7
November 18, 2019		

A Gas Vent

VENT ID	LEL(%)	O_2(%)
V-1	100	8.8
V-2	81	5.2
V-3	100	7.1
November 18, 2019		

NS = Not Sampled
LEL = Lower Explosive Limit

Figure

9

Combustible Gas and Oxygen Levels in Gas Monitoring Wellls for November 18, 2019 at Dulin Rubble Landfill

Kent County, Maryland

Date:	01/27/2020	Project Number:	4697E	Drawn By:	Shawn Stabile
Scale:	As Shown	Original Print Size:	11"X17"	Source:	iMAP 2016

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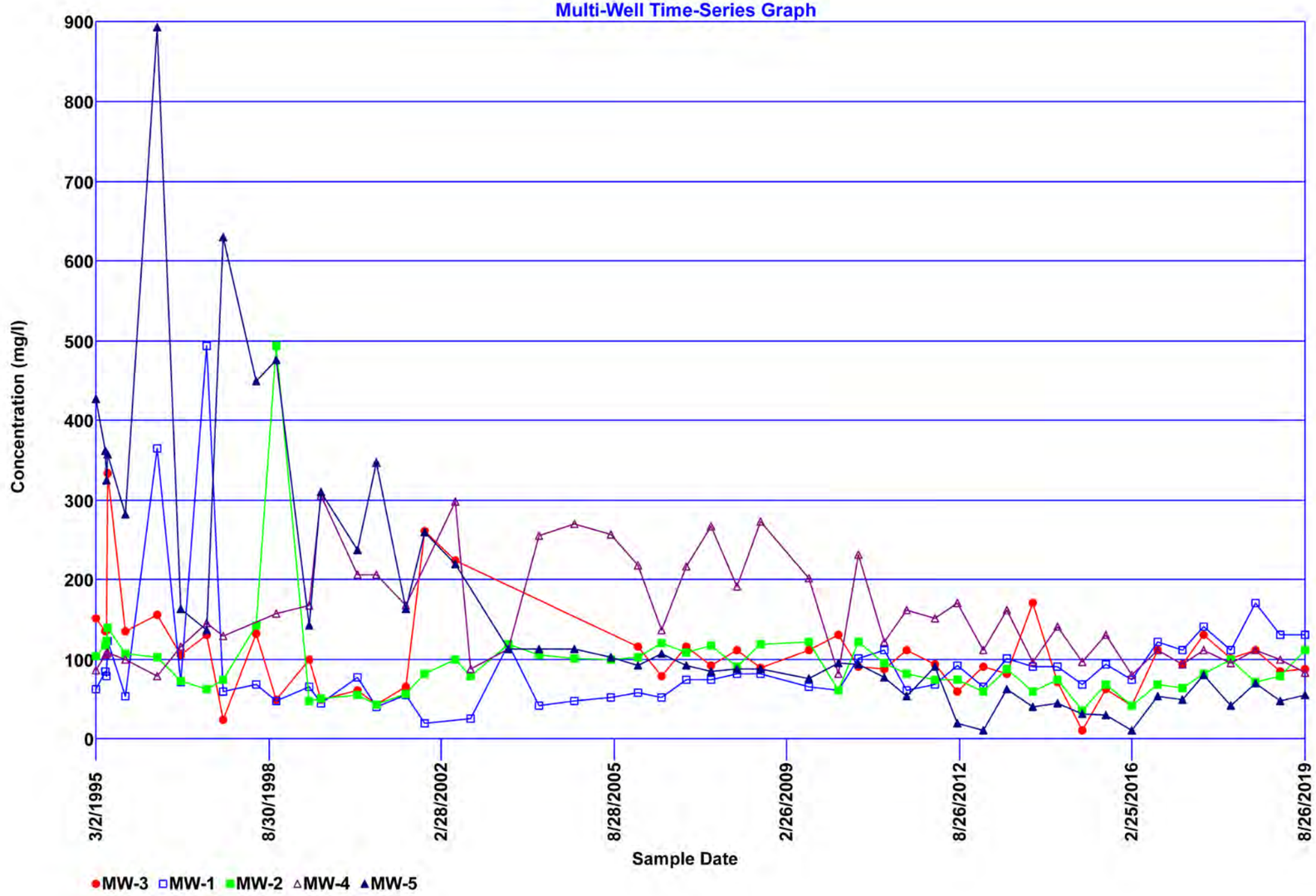
Rev#	Date	Description
	01/27/2020	



Dissolved Solids | Multi-Well Time-Series Graph | Multiple Wells

Figure

10

Concentration of Dissolved Solids in Water Samples at Nicholson Landfill

Kent County, Maryland

Date:	01/27/2020	Project Number:	4697E	Drawn By:	Shawn Stabile
Scale:	As Shown	Original Print Size:	11"X17"	Source:	Insert Sources

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Rev#	Date	Description
	01/27/2020	

TABLES

Parameter	GW Standard *	Well ID MW-1	MW-2	MW-3	MW-4	MW-5
Antimony (mg/L)	0.006	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (mg/L)	0.01	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (mg/L)	2	**0.0735**	**0.0221**	**0.0551**	**0.0278**	**0.0146**
Beryllium (mg/L)	0.004	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/L)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001
Calcium (mg/L)	----	**24**	**7.41**	**9.73**	**9.68**	**4.85**
Chromium (mg/L)	0.1	**0.0016**	**0.0012**	<0.001	**0.0016**	**0.0034**
Cobalt (mg/L)	0.073	<0.001	<0.001	<0.001	<0.001	**0.0012**
Copper (mg/L)	1.3	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (mg/L)	1.4	<0.1	<0.1	<0.1	<0.1	<0.1
Lead (mg/L)	0.015	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (mg/L)	----	**5.11**	**3.11**	**3.78**	**3.05**	**2.67**
Manganese (mg/L)	0.043	**0.0181**	**0.0106**	**0.0202**	**0.0302**	**0.0647**
Mercury (mg/L)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel (mg/L)	0.039	**0.0051**	**0.0018**	**0.001**	**0.0022**	**0.0021**
Potassium (mg/L)	----	**3.34**	**2.1**	**2.2**	**2.24**	**2.15**
Selenium (mg/L)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001
Silver (mg/L)	0.0094	<0.001	<0.001	<0.001	<0.001	<0.001
Sodium (mg/L)	---	**11.5**	**3.93**	**3.34**	**5.64**	**3.16**
Thallium (mg/L)	0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium (mg/L)	0.0086	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (mg/L)	0.6	**0.0269**	<0.02	**0.0566**	**0.0231**	**0.0211**

* Groundwater (GW) Standard based on EPA Maxiumum Contaminant Level, EPA Secondary Drinking Water Standard, or MDE Cleanup Standard for Type I/II Aquifers

ND = Not Detected

J = Result is an approximate value that is less than the laboratory Reporting Limit (RL) but greater than or equal to the laboratory Method Detection Limit (MDL).

Concentrations denoted in red are at or above the Groundwater Standard

Table 1 - Summary of RCRA Metals detected in water samples collected from monitoring wells in February 2019 at Dulin Rubble Landfill, Kent County, Maryland.

Parameter	GW Standard *	Well ID MW-1	MW-2	MW-3	MW-4	MW-5
Antimony (mg/L)	0.006	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (mg/L)	0.01	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (mg/L)	2	**0.0749**	**0.0264**	**0.0521**	**0.0362**	**0.0151**
Beryllium (mg/L)	0.004	<0.001	<0.001	<0.001	J0.00025	<0.001
Cadmium (mg/L)	0.005	<0.001	<0.001	<0.001	<0.001	<0.001
Calcium (mg/L)	----	**15.9**	**10.7**	**10.2**	**11.8**	**6.04**
Chromium (mg/L)	0.1	**0.0014**	**0.0011**	**0.0014**	J0.00082	**0.0033**
Cobalt (mg/L)	0.073	J0.00078	J0.00076	J0.00059	**0.0024**	**0.0012**
Copper (mg/L)	1.3	<0.001	**0.0044**	<0.001	**0.0034**	<0.001
Iron (mg/L)	1.4	J0.0234	<0.1	J0.0354	J0.0464	J0.0402
Lead (mg/L)	0.015	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (mg/L)	----	**5.02**	**3.29**	**4.09**	**2.72**	**2.47**
Manganese (mg/L)	0.043	**0.0171**	**0.0093**	**0.023**	**0.137**	**0.0591**
Mercury (mg/L)	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel (mg/L)	0.039	**0.0054**	**0.0028**	**0.002**	**0.0026**	**0.0019**
Potassium (mg/L)	----	**3.18**	**2.01**	**2**	**1.91**	**2.04**
Selenium (mg/L)	0.05	<0.001	<0.001	<0.001	<0.001	<0.001
Silver (mg/L)	0.0094	<0.001	<0.001	<0.001	<0.001	<0.001
Sodium (mg/L)	---	**9.85**	**4.27**	**4.02**	**3.26**	**2.93**
Thallium (mg/L)	0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium (mg/L)	0.0086	<0.001	<0.001	J0.00031	J0.00014	J0.00017
Zinc (mg/L)	0.6	**0.0303**	**0.0227**	**0.0343**	**0.0213**	**0.0248**

* Groundwater (GW) Standard based on EPA Maxiumum Contaminant Level, EPA Secondary Drinking Water Standard, or MDE Cleanup Standard for Type I/II Aquifers

ND = Not Detected

J = Result is an approximate value that is less than the laboratory Reporting Limit (RL) but greater than or equal to the laboratory Method Detection Limit (MDL).

Concentrations denoted in red are at or above the Groundwater Standard

Table 2 - Summary of RCRA Metals detected in water samples collected from monitoring wells in August 2019 at Dulin Rubble Landfill, Kent County, Maryland.

Parameter	GW Standard *	Well ID MW-1	MW-2	MW-3	MW-4	MW-5
Alkalinity (mg/L)	----	**1.2**	**2.2**	**4.4**	**1.1**	**7.7**
Ammonia (mg/L)	----	<0.2	<0.2	<0.2	<0.2	<0.2
Chemical Oxygen Demand (COD) (mg/L)	----	<5	<5	<5	<5	<5
Chloride (mg/L)	250	**14**	**8.1**	<5	**10**	<5
Dissolved Solids (mg/L)	500	**130**	**77**	**83**	**99**	**46**
Hardness (mg/L)	----	**81**	**31**	**40**	**37**	**23**
Nitrate (mg/L)	10	**16**	**7.7**	**6.5**	**10**	**4.5**
pH (units)	6.5 - 8.5	**5.5**	**5.7**	**5.9**	**5.5**	**6.0**
Specific Conductance (units/cm)	----	**180**	**100**	**120**	**130**	**75**
Sulfate (mg/L)	250	<5	<5	**17**	<5	<5
Turbidity (NTU)	5	<0.5	<0.5	**1.6**	<0.5	**1**

* Groundwater (GW) Standard based on EPA Maxiumum Contaminant Level, EPA Secondary Drinking Water Standard, or MDE Cleanup Standard for Type I/II Aquifers

ND = Not Detected

J = Result is an approximate value that is less than the laboratory Reporting Limit (RL) but greater than or equal to the laboratory Method Detection Limit (MDL).

Concentrations denoted in red are above the EPA Maximum Contaminant Levels (MCLs) for drinking water

Concentrations denoted in orange are above the EPA Secondary Maximum Contaminant Levels (SMCLs) for drinking water except pH levels are below the SMCL range

Table 3 - Summary of Indicator Parameters detected in water samples collected from monitoring wells in February 2019 at Dulin Rubble Landfill, Kent County, Maryland.

Parameter	GW Standard *	Well ID MW-1	MW-2	MW-3	MW-4	MW-5
Alkalinity (mg/L)	----	**1.1**	**1.1**	**2.5**	**3.2**	**9.2**
Ammonia (mg/L)	----	<0.2	<0.2	<0.2	<0.2	<0.2
Chemical Oxygen Demand (COD) (mg/L)	----	**6**	<5	<5	<5	<5
Chloride (mg/L)	250	**15**	**11**	**14**	**14**	J4.5
Dissolved Solids (mg/L)	500	**130**	**110**	**87**	**82**	**54**
Hardness (mg/L)	----	**60**	**40**	**42**	**41**	**25**
Nitrate (mg/L)	10	**18**	**11**	**5.2**	**7.1**	**4.7**
pH (units)	6.5 - 8.5	**5.6**	**5.7**	**5.4**	**5.4**	**5.9**
Specific Conductance (units/cm)	----	**190**	**120**	**130**	**120**	**82**
Sulfate (mg/L)	250	<5	<5	**12**	<5	<5
Turbidity (NTU)	5	**0.97**	**0.57**	**1.2**	**0.65**	**1.7**

* Groundwater (GW) Standard based on EPA Maxiumum Contaminant Level, EPA Secondary Drinking Water Standard, or MDE Cleanup Standard for Type I/II Aquifers

ND = Not Detected

J = Result is an approximate value that is less than the laboratory Reporting Limit (RL) but greater than or equal to the laboratory Method Detection Limit (MDL).

Concentrations denoted in red are above the EPA Maximum Contaminant Levels (MCLs) for drinking water

Concentrations denoted in orange are above the EPA Secondary Maximum Contaminant Levels (SMCLs) for drinking water except pH levels are below the SMCL range

Table 4 - Summary of Indicator Parameters detected in water samples collected from monitoring wells in August 2019 at Dulin Rubble Landfill, Kent County, Maryland.

	Gas Well ID								Vent ID					
	GW-1		GW-2		GW-3		GW-4		V-1		V-2		V-3	
Date	% LEL	O_2	% LEL	O_2	% LEL	O_2	% LEL	O_2	% LEL	O_2	% LEL	O_2	% LEL	O_2
22-Aug-06	100	0.0	20	13.9	100	---	22	4.8						
30-Nov-06	45	5.3	0	20.9	100	7.2	21	7.2						
21-Feb-07	0	21.3	2	21.6	100	9.4	0	21.1						
29-May-07	17	MF	11	MF	100	MF	7	MF						
22-Aug-07	88	MF	0	MF	100	MF	1	MF						
3-Dec-07	92	5.1	2	12.8	13	20.2	4	5.0						
26-Feb-08	68	7.2	2	20.7	100	10.7	2	17.6						
28-May-08	35	3.8	3	17.0	100	9.8	3	8.2						
20-Aug-08	2	0.0	2	13.9	100	0.1	2	2.0						
19-Nov-08	3	7.8	0	18.1	100	17.6	1	4.9						
26-Feb-09	0	14.6	0	18.4	100	17.0	0	12.2						
22-May-09	22	4.5	0	19.2	100	12.6	0	9.0						
24-Jun-09	55	12.0	0	17.1	91	6.5	0	8.9						
31-Jul-09	74	3.9	0	15.1	100	15.9	0	2.7						
28-Aug-09	59	5.1	0	19.1	100	15.0	0	5.1						
2-Oct-09	44	0.6	0	18.0	100	13.3	3	0.7						
30-Oct-09	36	1.1	1	19.8	34	2.1	1	2.2						
30-Nov-09	100	18.2	0	12.8	100	21.0	0	20.4						
30-Dec-09	8	5.3	0	20.0	0	20.0	0	9.4						
29-Jan-10	1	3.5	0	20.4	100	19.8	0	20.1						
9-Mar-10	26	3.8	0	20.7	100	20.0	0	15.2						
7-May-10	32	MF	0	MF	2	MF	1	MF						
14-May-10	12	0.4	0	13.7	100	4.5	0	4.5						
21-May-10	12	1.3	0	19.1	100	5.1	0	10.3						
28-May-10	3	20.9	0	17.5	0	20.9	7	10.5						
29-Jun-10	3	15.7	0	18.2	0	20.9	0	20.9	100	20.3	0	20.9	0	20.9
6-Jul-10	0	12.3	0	15.6	49	9.0	0	12.9	100	12.3	100	17.0	100	17.5
13-Jul-10	0	19.5	0	15.8	14	0.6	0	17.1	100	17.0	29	20.0	100	12.3
20-Jul-10	0	5.6	0	18.6	0	20.6	0	20.9	0	20.9	0	20.0	0	20.7
17-Aug-10	0	10.1	0	17.4	0	20.9	0	19.7	0	20.9	0	20.9	28	16.8
29-Nov-10	0	20.9	3	10.3	0	13.0	0	20.9	89	1.0	10	16.8	100	16.2
22-Feb-11	0	19.4	0	18.8	3	12.1	0	18.7	0	20.9	0	20.9	14	12.0
20-May-11	0	12.0	0	20.5	0	10.7	0	20.4	47	3.4	0	15.0	100	13.0
10-Aug-11	13	7.5	0	20.4	0	17.3	0	14.6	40	12.8	0	20.9	62	13.7
18-Nov-11	0	19.1	0	18.7	0	19.0	0	20.9	0	20.9	0	20.2	30	4.3
1-Mar-12	0	16.2	0	20.9	0	13.3	0	13.3	100	4.2	0	20.5	63	3.8
23-May-12	0	15.5	0	17.9	0	14.8	0	14.2	48	3.5	0	20.9	57	2.1
16-Aug-12	0	14.5	0	17.3	0	16.7	0	11.7	0	20.9	0	20.9	0	20.2
8-Nov-12	0	14.1	0	8.1	0	14.3	0	15.3	100	2.3	0	13.9	53	2.6
15-Feb-13	0	19.8	0	19.3	0	13.4	0	12.6	60	1.5	0	14.1	59	1.9
16-May-13	0	17.4	0	16.7	0	18.7	0	19.5	100	16.6	0	20.9	0	20.5
15-Aug-13	26	7.6	35	9.5	35	11.8	35	8.6	100	17.7	23	19.0	100	3.9
11-Nov-13	0	20.2	42	16.6	0	20.4	0	20.6	100	20.5	23	20.5	100	20.5
28-Feb-14	3.5	17.4	0	19.8	0	20.0	50	16.8	100	12.4	0	19.5	0	19.9
24-Sep-14	0	20.4	0	12.8	0	20.5	0	20.6	0	20.4	0	19.7	37	2.4
1-Dec-14	0	17.8	0	11.2	0	13.5	0	20.5	100	0.9	0	12.2	100	1.5
23-Feb-15	0	20.1	0	13.2	0	17.8	0	20.1	100	1.5	0	19.3	0	20.0
19-May-15	0	20.3	0	12.4	0	18.5	0	20.4	10	7.7	0	20.4	100	2.7
19-Aug-15	0	20.3	0	15.2	0	20.3	0	20.3	0	20.3	0	20.3	0	20.3
16-Nov-15	0	15.2	0	13.7	0	18.2	0	12.8	100	0.5	0	14.8	66	0.9
22-Feb-16	0	18.3	0	18.0	0	20.3	0	20.5	0	20.4	0	20.4	0	20.4
12-May-16	0	17.4	0	16.3	0	10.8	0	13.2	44	0.9	0	13.4	69	0.9
6-Sep-16	0	20.9	0	8.3	0	12.1	0	20.9	50	1.0	0	11.0	50	1.7
15-Nov-16	0	15.6	0	14.8	0	19.2	0	12.9	100	13.1	44	9.2	100	10.9
6-Mar-17	0	18.3	0	20.9	0	17.5	5	15.9	100	0.4	0	9.1	100	0.3
18-May-17	0	15.2	0	14.5	0	15.3	0	14.2	17	11.9	0	20.9	17	6.7
8-Aug-17	0	7.1	2	16.2	0	14.5	0	10.2	0	22.9	0	22.9	23	7.4
14-Nov-17	0	10.1	0	10.1	0	14.3	0	4.5	100	4.4	36	0.8	100	16.9
26-Feb-18	0	17.1	0	17.3	0	20.9	0	20.9	0	20.9	0	20.9	0	20.9
8-May-18	0	14.3	0	18.8	0	12.0	0	14.1	27	0.0	0	18.6	28	4.1
24-Aug-18	7	9.5	0	17.8	0	13.0	4	11.3	0	20.9	0	20.9	0	20.9
26-Nov-18	0	11.4	0	10.4	0	11.1	0	10.7	100	1.3	10	6.8	100	1.9
25-Feb-19	0	18.7	0	16.2	0	18.6	0	13.1	0	18.2	0	20.9	0	20.9
20-May-19	0	12.8	0	14.2	0	19.5	0	13.1	90	6.5	0	14.5	50	1.2
26-Aug-19	0	6.7	0	6.6	0	16.3	0	9.3	0	20.0	0	11.9	63	0.0
18-Nov-19	0	18.7	0	12.9	0	17.4	0	14.7	100	8.8	81	5.2	100	7.1

Vents installed June 2010

Installation of vents

MF = Instrument Malfunction

Table 5. Summary of combustible gas and oxygen levels in gas monitoring wells and vents at Dulin Rubble Landfill, Kent County, Maryland

	Soil Vapor Monitoring Point ID															
	SV-1		SV-2		SV-3		SV-4		SV-5		SV-12		SV-13		SV-14	
Date	% LEL	O_2	% LEL	O_2	% LEL	O_2	% LEL	O_2	% LEL	O_2	% LEL	O_2	% LEL	O_2	% LEL	O_2
7-May-10	67	MF	100	MF	95	MF	100	MF	100	MF	100	MF	100	MF	100	MF
14-May-10	100	17.6	100	1.6	100	2.6	100	19.5	100	18.5	100	18.0	100	16.8	100	12.6
21-May-10	100	16.8	100	2.3	100	1.8	100	18.7	100	18.6	100	19.1	100	13.3	100	10.2
28-May-10	17	19.7	0	20.9	0	20.9	0	20.9	0	20.9	100	17.5	43	17.4	0	20.9
29-Jun-10	0	20.9	100	15.8	0	20.9	0	20.9	0	20.9	100	17.6	100	20.2	6	20.9
6-Jul-10	40	13.8	63	12.3	0	19.9	50	0.0	100	4.1	100	14.4	100	16.0	100	12.3
13-Jul-10	24	9.6	0	9.9	0	17.2	27	4.7	48	9.8	100	9.5	100	14.7	100	11.3
20-Jul-10	0	20.5	0	19.8	0	20.9	0	20.9	0	20.7	0	20.6	24	17.4	0	20.6
17-Aug-10	0	15.5	3	17.3	0	20.4	0	17.7	0	15.8	41	8.9	100	13.9	33	6.1
29-Nov-10	0	13.7	3	9.2	NS	NS	NS	NS	NS	NS	79	5.9	16	8.1	0	20.9
22-Feb-11	0	17.2	0	10.2	0	20.4	0	15.0	0	14.2	12	15.6	3	19.3	3	15.7
20-May-11	0	12.6	0	10.5	0	17.5	0	12.2	0	10.5	0	16.6	7	13.0	0	20.1
10-Aug-11	0	16.5	0	14.3	0	18.3	0	13.5	0	12.2	0	14.3	6	11.6	0	20.1
18-Nov-11	0	14.2	0	16.9	0	20.9	0	14.2	0	14.0	0	17.7	4	18.1	2	11.6
1-Mar-12	0	19.1	0	20.5	0	14.3	0	14.1	0	12.8	0	14.3	4	13.9	0	15.4
23-May-12	2	16.3	0	14.7	0	17.9	0	15.6	0	16.2	2	15.3	2	14.3	2	13.7
16-Aug-12	0	17.1	0	16.6	0	18.8	0	16.2	0	17.5	0	16.4	0	15.9	0	15.4
8-Nov-12	lost		0	14.8	0	16.5	0	15.2	0	15.4	0	13.9	0	0.0	0	15.4
15-Feb-13	----------		0	13.4	0	15.3	0	16.2	0	15.0	0	14.3	0	15.1	0	17.0
16-May-13	----------		0	18.8	0	20.0	0	20.9	0	18.9	0	17.1	0	20.2	0	17.2
15-Aug-13	----------		29	13.7	26	18.5	32	14.8	32	15.5	29	15.5	17	16.8	32	11.1
11-Nov-13	----------		26	18.0	32	16.8	38	15.1	38	16.0	29	14.6	100	15.7	0	20.5
28-Feb-14	----------		0	20.0	0	20.0	55	17.0	58	15.6	0	20.0	0	19.8	0	19.8
24-Sep-14	----------		0	20.5	0	20.6	0	18.6	0	19.4	0	20.5	0	20.4	0	20.5
1-Dec-14	----------		0	12.9	0	15.2	0	15.9	0	17.4	0	7.5	0	20.5	0	15.8
23-Feb-15	----------		0	20.1	0	20.0	0	19.1	0	18.9	0	20.0	0	20.0	0	18.2
19-May-15	----------		0	18.6	0	13.2	0	20.2	0	18.3	0	20.4	0	13.8	0	19.5
19-Aug-15	----------		0	20.3	0	20.3	0	20.3	0	18.2	0	20.4	0	20.3	0	20.3
16-Nov-15	----------		0	15.3	0	15.3	0	15.1	0	17.8	0	16.0	0	18.1	0	14.9
22-Feb-16	----------		0	20.4	0	20.4	0	18.4	0	17.0	0	20.3	0	19.8	0	20.5
12-May-16	----------		0	13.2	0	16.4	0	16.4	0	16.1	0	15.9	0	15.8	0	16.4
6-Sep-16	0	15.5	0	18.6	0	17.9	0	18.7	0	18.1	0	15.7	0	15.2	0	13.2
15-Nov-16	0	20.3	0	17.2	0	16.1	0	16.5	0	17.4	0	12.8	0	17.8	0	18.2
6-Mar-17	0	17.3	0	16.0	0	17.1	0	15.0	0	17.4	0	16.3	0	18.7	0	18.4
18-May-17	0	20.9	0	15.6	0	16.7	0	17.2	0	16.9	0	18.5	0	18.8	0	15.9
8-Aug-17	0	16.2	0	15.4	0	16.7	0	16.9	0	16.9	0	12.4	0	11.7	0	11.1
14-Nov-17	0	9.2	0	7.5	0	12.8	0	10.5	0	13.0	0	7.1	0	13.9	0	12.0
26-Feb-18	0	20.9	0	20.9	0	20.9	0	16.1	0	16.7	0	11.2	0	20.1	0	16.1
5-May-18	0	20.9	0	14.8	0	16.2	0	15.7	0	15.3	0	16.2	0	21.2	0	15.9
24-Aug-18	0	15.5	0	14.2	0	15.7	0	15.0	0	14.6	0	15.9	0	14.4	3	12.2
26-Nov-18	0	13.1	0	11.5	0	13.9	0	13.4	0	12.5	0	20.4	0	11.2	0	11.3
25-Feb-19	0	20.9	0	15.2	0	16.9	0	18.2	0	20.9	0	20.4	0	15.6	0	17.6
20-May-19	0	20.2	0	16.0	0	17.2	0	17.3	0	16.7	0	11.2	0	13.2	0	16.0
26-Aug-19	0	20.2	0	14.8	0	15.4	0	14.7	0	14.2	0	13.4	0	15.3	4	12.7
18-Nov-19	0	16.1	0	15.4	0	17.1	0	16.8	0	16.5	0	13.1	0	16.8	4	16.0

Installation of vents

MF = Instrument Malfunction

Table 6. Summary of combustible gas and oxygen levels in soil vapor points at Dulin Rubble Landfill, Kent County, Maryland

APPENDICES

APPENDIX A

Earth Data Field Reports
(Groundwater Sampling)

Earth Data Incorporated

131 Comet Drive, Centreville, Maryland

FIELD NOTES

EDI W.O. # 4697D	**PROJECT:** Kent Co. Landfill – Dulin
DATE: February 25, 2019	**LOCATION:** Chestertown, Maryland

EDI Personnel Onsite: J. Chipman T. Trumbull
Onsite Time: 9:30am-1:00pm

Weather: Sunny 46° F

Earth Data Inc. personnel arrived onsite to collect water samples from 5 onsite groundwater monitoring wells. Prior to sampling, each monitoring well was gauged with an oil/water interface probe. The depth to water (DTW) from the top of casing (TOC) was measured and recorded (see Gauging Data Report).

Each monitoring well was purged of three well-volumes of water using a 12-volt submersible purge pump. After purging, a water sample was collected from each well for laboratory analysis. Each sample was collected in laboratory-supplied sample containers, labeled and immediately placed on ice in the field for subsequent transfer to an EPA-approved laboratory via courier. Sampling pumps were decontaminated between wells. Tubing was replaced between wells. A duplicate sample (Duplicate) was collected from MW-1.

Signed: _____

Devan Smith-Brown

Project Name:	**Kent County Landfill**	Date:	**25-Feb-2019**
Project #:	**4697D**	Time onsite:	**9:30 AM**
Location:	**Chestertown, Maryland**	Weather:	**sunny 90**
Site:	**Dulin Landfill**	Vehicle:	**Tundra, CRV2**
Personnel present at site:	**JC, DSB, TT**	Completed by:	**DSB**

Reason for site visit:	yes	no
Surveying	☐	☑
Monitoring Well Gauging	☑	☐
Monitoring Well Sampling	☑	☐
Methane Gas Monitoring	☐	☑
Other (explain)	☐	☐

Scheduled Activities	Checklist	yes	no	n/a	Comments
Groundwater Monitoring Wells	Measured water levels	☑	☐	☐	Sampled all wells onsite
	Groundwater Sampling	☑	☐	☐	
	Collected sample(s) in lab bottles & chilled	☑	☐	☐	
	Filled out labels & Chain-of-Custody	☑	☐	☐	
	Surveyed well elevations	☐	☐	☑	
Methane Gas Monitoring Wells	Gas Vapor Monitoring	☐	☑	☐	
	Gas Vapor Sampling	☐	☐	☑	
	Collected sample(s) in lab bottle(s) & chilled	☐	☐	☑	
	Filled out labels and chain-of-custody	☐	☐	☑	
Other Activities	Completed site sketch	☐	☐	☑	
	Completed Materials & Equipment form	☑	☐	☐	

Comments

Gauged and sampled all wells
Duplicate sample collected from MW-1

Earth Data Incorporated

131 Comet Drive, Centreville, Maryland

FIELD NOTES

EDI W.O. # 4697E	**PROJECT:** Kent Co. Landfill – Dulin
DATE: August 26, 2019	**LOCATION:** Chestertown, Maryland

EDI Personnel Onsite: J. Chipman A. Dunn, S. Wolf Weather: Sunny 80° F
Onsite Time: 10:00am-1:30pm

Earth Data Inc. personnel arrived onsite to collect water samples from 5 onsite groundwater monitoring wells. Prior to sampling, each monitoring well was gauged with an oil/water interface probe. The depth to water (DTW) from the top of casing (TOC) was measured and recorded (see Gauging Data Report).

Each monitoring well was purged of three well-volumes of water using a 12-volt submersible purge pump. After purging, a water sample was collected from each well for laboratory analysis. Each sample was collected in laboratory-supplied sample containers, labeled and immediately placed on ice in the field for subsequent transfer to an EPA-approved laboratory via courier. Sampling pumps were decontaminated between wells. Tubing was replaced between wells. Field pH, and conductivity were sampled and summarized below. A duplicate sample (Duplicate) was collected from MW-1.

Well ID	pH	Conductivity (µS)
MW-1	5.87	189.8
MW-2	6.01	125.5
MW-3	5.67	139.3
MW-4	5.71	122.7
MW-5	5.99	77.8

Signed: _____

Jeff Chipman

Project Name:	**Kent County Landfill**	Date:	**08/26/2019**
Project #:	**4697E**	Time onsite:	**10:00 AM**
Location:	**Chestertown, Maryland**	Weather:	**sunny 80 F**
Site:	**Dulin Landfill**	Vehicle:	**Tundra, CRV2**
Personnel present at site:	**JC, AD, SW**	Completed by:	**JC**

Reason for site visit:	yes	no
Surveying	☐	☑
Monitoring Well Gauging	☑	☐
Monitoring Well Sampling	☑	☐
Methane Gas Monitoring	☐	☑
Other (explain)	☐	☐

Scheduled Activities	Checklist	yes	no	n/a	Comments
Groundwater Monitoring Wells	Measured water levels	☑	☐	☐	Sampled all wells onsite
	Groundwater Sampling	☑	☐	☐	
	Collected sample(s) in lab bottles & chilled	☑	☐	☐	
	Filled out labels & Chain-of-Custody	☑	☐	☐	
	Surveyed well elevations	☐	☐	☑	
Methane Gas Monitoring Wells	Gas Vapor Monitoring	☐	☑	☐	
	Gas Vapor Sampling	☐	☐	☑	
	Collected sample(s) in lab bottle(s) & chilled	☐	☐	☑	
	Filled out labels and chain-of-custody	☐	☐	☑	
Other Activities	Completed site sketch	☐	☐	☑	
	Completed Materials & Equipment form	☑	☐	☐	

Comments

Gauged and sampled all wells
Duplicate sample collected from MW-1

APPENDIX B

Well Gauging Reports

WATER LEVEL DATA SHEET

W.O.:	**4697D**	DATE:	**25-Feb-2019**
		WEATHER:	**Sunny 45 F**
PROJECT:	**Kent County Landfill - Dulin Landfill**	COLLECTED BY:	**DSB, JC, TB**
LOCATION:	**Chestertown, Maryland**	ENTERED BY:	**DSB**

Monitoring Point	Well Tag Number	Time	Description of Measuring Point (ft msl)	Measuring Point Elevation (ft)	Water Depth (ft)	Water Level Elevation (ft msl)	COMMENTS
MW-1	KE-88-0232	12:00 PM	Lip of Casing	37.07	6.10	30.97	Sampled, duplicate sample taken
MW-2	KE-88-0233	11:35 AM	Lip of Casing	40.30	7.88	32.42	Sampled
MW-3	KE-94-0891	11:25 AM	Lip of Casing	41.89	6.43	35.46	Sampled
MW-4	KE-88-0235	10:45 AM	Lip of Casing	74.96	43.10	31.86	Sampled
MW-5	KE-88-0674	10:10 AM	Lip of Casing	54.39	21.98	32.41	Sampled

NOTE: MEASURING POINT ELEVATION OBTAINED FROM CENTURY ENGINEERING INC. 02-27-2005

WATER LEVEL DATA SHEET

W.O.:	**4697E**	DATE:	**08/26/2019**
		WEATHER:	**Sunny 80 F**
PROJECT:	**Kent County Landfill - Dulin Landfill**	COLLECTED BY:	**JC, AD, SW**
LOCATION:	**Chestertown, Maryland**	ENTERED BY:	**JC**

Monitoring Point	Well Tag Number	Time	Description of Measuring Point (ft msl)	Measuring Point Elevation (ft)	Water Depth (ft)	Water Level Elevation (ft msl)	COMMENTS
MW-1	KE-88-0232	1:00 PM	Lip of Casing	37.07	7.15	29.92	Sampled, duplicate sample taken
MW-2	KE-88-0233	12:05 PM	Lip of Casing	40.30	8.83	31.47	Sampled
MW-3	KE-94-0891	11:55 AM	Lip of Casing	41.89	7.42	34.47	Sampled
MW-4	KE-88-0235	11:15 AM	Lip of Casing	74.96	43.49	31.47	Sampled
MW-5	KE-88-0674	10:35 AM	Lip of Casing	54.39	22.82	31.57	Sampled

NOTE: MEASURING POINT ELEVATION OBTAINED FROM CENTURY ENGINEERING INC. 02-27-2005

APPENDIX C

Laboratory Analytical Reports
(VOCs, Total Metals & Indicator Parameters)

Analytical Report for

Earth Data, Inc

Certificate of Analysis No.: 19022602

Project Manager: J.P. Stokes

Project Name : Dulin Landfill

Project Location: Chestertown, Maryland

Project ID : 4697D

March 5, 2019

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

March 5, 2019

J.P. Stokes
Earth Data, Inc
131 Comet Drive
Centreville, MD 21617

Reference: PSS Work Order(s) No: **19022602**
Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID.: 4697D

Dear J.P. Stokes :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **19022602**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on April 2, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Earth Data, Inc

Project Name: Dulin Landfill

Work Order Number(s): 19022602

Project ID: 4697D

The following samples were received under chain of custody by Phase Separation Science (PSS) on 02/26/2019 at 08:46 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
19022602-001	MW-1	GROUND WATER	02/25/19 12:00
19022602-002	MW-2	GROUND WATER	02/25/19 11:35
19022602-003	MW-3	GROUND WATER	02/25/19 11:25
19022602-004	MW-4	GROUND WATER	02/25/19 10:45
19022602-005	MW-5	GROUND WATER	02/25/19 10:10

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-1 **Date/Time Sampled: 02/25/2019 12:00** **PSS Sample ID: 19022602-001**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Turbidity — Analytical Method: EPA 180.1

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Turbidity	ND	NTU	0.50		1	02/26/19	02/26/19 15:57	1061

Total Metals (22 & Hardness) — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	ug/L	5.0		1	02/27/19	02/27/19 17:33	1064
Arsenic	ND	ug/L	1.0		1	02/27/19	02/27/19 17:33	1064
Barium	**73.5**	ug/L	1.00		1	02/27/19	02/27/19 17:33	1064
Beryllium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:33	1064
Cadmium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:33	1064
Calcium	**24,000**	ug/L	2,000		20	02/27/19	03/01/19 14:58	1064
Chromium	**1.6**	ug/L	1.0		1	02/27/19	02/27/19 17:33	1064
Cobalt	ND	ug/L	1.0		1	02/27/19	02/27/19 17:33	1064
Copper	ND	ug/L	1.0		1	02/27/19	02/27/19 17:33	1064
Iron	ND	ug/L	100		1	02/27/19	02/27/19 17:33	1064
Lead	ND	ug/L	1.0		1	02/27/19	02/27/19 17:33	1064
Magnesium	**5,110**	ug/L	100		1	02/27/19	02/27/19 17:33	1064
Manganese	**18.1**	ug/L	1.00		1	02/27/19	02/27/19 17:33	1064
Mercury	ND	ug/L	0.20		1	02/27/19	02/27/19 17:33	1064
Nickel	**5.1**	ug/L	1.0		1	02/27/19	02/27/19 17:33	1064
Potassium	**3,340**	ug/L	100		1	02/27/19	02/27/19 17:33	1064
Selenium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:33	1064
Silver	ND	ug/L	1.0		1	02/27/19	02/27/19 17:33	1064
Sodium	**11,500**	ug/L	2,000		20	02/27/19	03/01/19 14:58	1064
Thallium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:33	1064
Vanadium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:33	1064
Zinc	**26.9**	ug/L	20.0		1	02/27/19	02/27/19 17:33	1064
Hardness (Ca & Mg)	**81**	mg/L	5.4		1	02/27/19	02/27/19 17:33	1064

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-1 **Date/Time Sampled: 02/25/2019 12:00** **PSS Sample ID: 19022602-001**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Chloride, Sulfate & Nitrate — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloride	**14**	mg/L	5.0		1	02/26/19	02/26/19 12:59	1053
Nitrate (as N)	**16**	mg/L	0.10		1	02/26/19	02/26/19 12:59	1053
Sulfate	ND	mg/L	5.0		1	02/26/19	02/26/19 12:59	1053

Alkalinity Low Level — Analytical Method: SM 2320B -11

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Alkalinity, Total (as CaCO3)	**1.2**	mg/L	1.0		1	02/28/19	02/28/19 15:37	1053

Conductivity — Analytical Method: SM 2510B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Conductivity	**180**	us/cm	10		1	02/26/19	02/26/19 13:17	1061

Total Dissolved Solids (TDS) — Analytical Method: SM 2540C -2011 — Preparation Method: SM2540C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Total Dissolved Solids	**130**	mg/L	10		1	02/26/19	02/27/19 11:00	1061

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
pH	**5.5**	S.U.			1	02/26/19	02/26/19 13:14	1061

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	02/27/19	02/27/19 13:27	1053

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March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-1 **Date/Time Sampled: 02/25/2019 12:00** **PSS Sample ID: 19022602-001**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Chemical Oxygen Demand — Analytical Method: SM 5220D -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	mg/L	5.0		1	02/27/19	02/27/19 14:43	1053

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No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-1 **Date/Time Sampled: 02/25/2019 12:00** **PSS Sample ID: 19022602-001**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Vinyl chloride	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Bromomethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Chloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Acetone	ND	ug/L	10		1	03/01/19	03/01/19 13:41	1011
Cyclohexane	ND	ug/L	10		1	03/01/19	03/01/19 13:41	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/01/19	03/01/19 13:41	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Methylene chloride	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Vinyl acetate	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/01/19	03/01/19 13:41	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Bromochloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Chloroform	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Carbon tetrachloride	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Benzene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Dibromomethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Methyl Acetate	ND	ug/L	10		1	03/01/19	03/01/19 13:41	1011
Acrylonitrile	ND	ug/L	10		1	03/01/19	03/01/19 13:41	1011
Trichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Carbon Disulfide	ND	ug/L	10		1	03/01/19	03/01/19 13:41	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-1 **Date/Time Sampled: 02/25/2019 12:00** **PSS Sample ID: 19022602-001**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	03/01/19	03/01/19 13:41	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Toluene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
2-Hexanone (MBK)	ND	ug/L	5.0		1	03/01/19	03/01/19 13:41	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Bromoform	ND	ug/L	5.0		1	03/01/19	03/01/19 13:41	1011
trans-1,4-dichloro-2-butene	ND	ug/L	5.0		1	03/01/19	03/01/19 13:41	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Chlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Ethylbenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
m&p-Xylene	ND	ug/L	2.0		1	03/01/19	03/01/19 13:41	1011
Styrene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
o-Xylene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
1,2,3-Trichloropropane	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	5.0		1	03/01/19	03/01/19 13:41	1011
Naphthalene	ND	ug/L	1.0		1	03/01/19	03/01/19 13:41	1011
Iodomethane	ND	ug/L	20		1	03/01/19	03/01/19 13:41	1011

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CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-2 **Date/Time Sampled: 02/25/2019 11:35** **PSS Sample ID: 19022602-002**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Turbidity — Analytical Method: EPA 180.1

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Turbidity	ND	NTU	0.50		1	02/26/19	02/26/19 15:57	1061

Total Metals (22 & Hardness) — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	ug/L	5.0		1	02/27/19	02/27/19 17:49	1064
Arsenic	ND	ug/L	1.0		1	02/27/19	02/27/19 17:49	1064
Barium	**22.1**	ug/L	1.00		1	02/27/19	02/27/19 17:49	1064
Beryllium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:49	1064
Cadmium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:49	1064
Calcium	**7,410**	ug/L	100		1	02/27/19	02/27/19 17:49	1064
Chromium	**1.2**	ug/L	1.0		1	02/27/19	02/27/19 17:49	1064
Cobalt	ND	ug/L	1.0		1	02/27/19	02/27/19 17:49	1064
Copper	ND	ug/L	1.0		1	02/27/19	02/27/19 17:49	1064
Iron	ND	ug/L	100		1	02/27/19	02/27/19 17:49	1064
Lead	ND	ug/L	1.0		1	02/27/19	02/27/19 17:49	1064
Magnesium	**3,110**	ug/L	100		1	02/27/19	02/27/19 17:49	1064
Manganese	**10.6**	ug/L	1.00		1	02/27/19	02/27/19 17:49	1064
Mercury	ND	ug/L	0.20		1	02/27/19	02/27/19 17:49	1064
Nickel	**1.8**	ug/L	1.0		1	02/27/19	02/27/19 17:49	1064
Potassium	**2,100**	ug/L	100		1	02/27/19	02/27/19 17:49	1064
Selenium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:49	1064
Silver	ND	ug/L	1.0		1	02/27/19	02/27/19 17:49	1064
Sodium	**3,930**	ug/L	100		1	02/27/19	02/27/19 17:49	1064
Thallium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:49	1064
Vanadium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:49	1064
Zinc	ND	ug/L	20		1	02/27/19	02/27/19 17:49	1064
Hardness (Ca & Mg)	**31**	mg/L	0.66		1	02/27/19	02/27/19 17:49	1064

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CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-2 **Date/Time Sampled: 02/25/2019 11:35** **PSS Sample ID: 19022602-002**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Chloride, Sulfate & Nitrate — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloride	**8.1**	mg/L	5.0		1	02/26/19	02/26/19 13:43	1053
Nitrate (as N)	**7.7**	mg/L	0.10		1	02/26/19	02/26/19 13:43	1053
Sulfate	ND	mg/L	5.0		1	02/26/19	02/26/19 13:43	1053

Alkalinity Low Level — Analytical Method: SM 2320B -11

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Alkalinity, Total (as CaCO3)	**2.2**	mg/L	1.0		1	02/28/19	02/28/19 15:37	1053

Conductivity — Analytical Method: SM 2510B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Conductivity	**100**	us/cm	10		1	02/26/19	02/26/19 13:17	1061

Total Dissolved Solids (TDS) — Analytical Method: SM 2540C -2011 — Preparation Method: SM2540C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Total Dissolved Solids	**77**	mg/L	10		1	02/26/19	02/27/19 11:00	1061

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
pH	**5.7**	S.U.			1	02/26/19	02/26/19 13:14	1061

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	02/27/19	02/27/19 13:39	1053

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Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-2 **Date/Time Sampled: 02/25/2019 11:35** **PSS Sample ID: 19022602-002**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Chemical Oxygen Demand — Analytical Method: SM 5220D -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	mg/L	5.0		1	02/27/19	02/27/19 14:43	1053

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March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-2 **Date/Time Sampled: 02/25/2019 11:35** **PSS Sample ID: 19022602-002**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Vinyl chloride	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Bromomethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Chloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Acetone	ND	ug/L	10		1	03/01/19	03/01/19 14:02	1011
Cyclohexane	ND	ug/L	10		1	03/01/19	03/01/19 14:02	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/01/19	03/01/19 14:02	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Methylene chloride	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Vinyl acetate	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/01/19	03/01/19 14:02	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Bromochloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Chloroform	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Carbon tetrachloride	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Benzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Dibromomethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Methyl Acetate	ND	ug/L	10		1	03/01/19	03/01/19 14:02	1011
Acrylonitrile	ND	ug/L	10		1	03/01/19	03/01/19 14:02	1011
Trichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Carbon Disulfide	ND	ug/L	10		1	03/01/19	03/01/19 14:02	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-2 **Date/Time Sampled: 02/25/2019 11:35** **PSS Sample ID: 19022602-002**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	03/01/19	03/01/19 14:02	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Toluene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
2-Hexanone (MBK)	ND	ug/L	5.0		1	03/01/19	03/01/19 14:02	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Bromoform	ND	ug/L	5.0		1	03/01/19	03/01/19 14:02	1011
trans-1,4-dichloro-2-butene	ND	ug/L	5.0		1	03/01/19	03/01/19 14:02	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Chlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Ethylbenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
m&p-Xylene	ND	ug/L	2.0		1	03/01/19	03/01/19 14:02	1011
Styrene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
o-Xylene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
1,2,3-Trichloropropane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	5.0		1	03/01/19	03/01/19 14:02	1011
Naphthalene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:02	1011
Iodomethane	ND	ug/L	20		1	03/01/19	03/01/19 14:02	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-3 **Date/Time Sampled: 02/25/2019 11:25** **PSS Sample ID: 19022602-003**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Turbidity — Analytical Method: EPA 180.1

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Turbidity	**1.6**	NTU	0.50		1	02/26/19	02/26/19 15:57	1061

Total Metals (22 & Hardness) — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	ug/L	5.0		1	02/27/19	02/27/19 17:54	1064
Arsenic	ND	ug/L	1.0		1	02/27/19	02/27/19 17:54	1064
Barium	**55.1**	ug/L	1.00		1	02/27/19	02/27/19 17:54	1064
Beryllium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:54	1064
Cadmium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:54	1064
Calcium	**9,730**	ug/L	100		1	02/27/19	02/27/19 17:54	1064
Chromium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:54	1064
Cobalt	ND	ug/L	1.0		1	02/27/19	02/27/19 17:54	1064
Copper	ND	ug/L	1.0		1	02/27/19	02/27/19 17:54	1064
Iron	ND	ug/L	100		1	02/27/19	02/27/19 17:54	1064
Lead	ND	ug/L	1.0		1	02/27/19	02/27/19 17:54	1064
Magnesium	**3,780**	ug/L	100		1	02/27/19	02/27/19 17:54	1064
Manganese	**20.2**	ug/L	1.00		1	02/27/19	02/27/19 17:54	1064
Mercury	ND	ug/L	0.20		1	02/27/19	02/27/19 17:54	1064
Nickel	**1.0**	ug/L	1.0		1	02/27/19	02/27/19 17:54	1064
Potassium	**2,200**	ug/L	100		1	02/27/19	02/27/19 17:54	1064
Selenium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:54	1064
Silver	ND	ug/L	1.0		1	02/27/19	02/27/19 17:54	1064
Sodium	**3,340**	ug/L	100		1	02/27/19	02/27/19 17:54	1064
Thallium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:54	1064
Vanadium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:54	1064
Zinc	**56.6**	ug/L	20.0		1	02/27/19	02/27/19 17:54	1064
Hardness (Ca & Mg)	**40**	mg/L	0.66		1	02/27/19	02/27/19 17:54	1064

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-3 **Date/Time Sampled: 02/25/2019 11:25** **PSS Sample ID: 19022602-003**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Chloride, Sulfate & Nitrate — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloride	ND	mg/L	5.0		1	02/26/19	02/26/19 14:06	1053
Nitrate (as N)	**6.5**	mg/L	0.10		1	02/26/19	02/26/19 14:06	1053
Sulfate	**17**	mg/L	5.0		1	02/26/19	02/26/19 14:06	1053

Alkalinity Low Level — Analytical Method: SM 2320B -11

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Alkalinity, Total (as CaCO3)	**4.4**	mg/L	1.0		1	02/28/19	02/28/19 15:37	1053

Conductivity — Analytical Method: SM 2510B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Conductivity	**120**	us/cm	10		1	02/26/19	02/26/19 13:17	1061

Total Dissolved Solids (TDS) — Analytical Method: SM 2540C -2011 — Preparation Method: SM2540C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Total Dissolved Solids	**83**	mg/L	10		1	02/26/19	02/27/19 11:00	1061

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
pH	**5.9**	S.U.			1	02/26/19	02/26/19 13:14	1061

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	02/27/19	02/27/19 13:43	1053

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No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-3 **Date/Time Sampled: 02/25/2019 11:25** **PSS Sample ID: 19022602-003**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Chemical Oxygen Demand — Analytical Method: SM 5220D -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	mg/L	5.0		1	02/27/19	02/27/19 14:43	1053

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CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-3 **Date/Time Sampled: 02/25/2019 11:25** **PSS Sample ID: 19022602-003**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Vinyl chloride	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Bromomethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Chloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Acetone	ND	ug/L	10		1	03/01/19	03/01/19 14:23	1011
Cyclohexane	ND	ug/L	10		1	03/01/19	03/01/19 14:23	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/01/19	03/01/19 14:23	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Methylene chloride	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Vinyl acetate	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/01/19	03/01/19 14:23	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Bromochloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Chloroform	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Carbon tetrachloride	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Benzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Dibromomethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Methyl Acetate	ND	ug/L	10		1	03/01/19	03/01/19 14:23	1011
Acrylonitrile	ND	ug/L	10		1	03/01/19	03/01/19 14:23	1011
Trichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Carbon Disulfide	ND	ug/L	10		1	03/01/19	03/01/19 14:23	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-3 **Date/Time Sampled: 02/25/2019 11:25** **PSS Sample ID: 19022602-003**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	03/01/19	03/01/19 14:23	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Toluene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
2-Hexanone (MBK)	ND	ug/L	5.0		1	03/01/19	03/01/19 14:23	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Bromoform	ND	ug/L	5.0		1	03/01/19	03/01/19 14:23	1011
trans-1,4-dichloro-2-butene	ND	ug/L	5.0		1	03/01/19	03/01/19 14:23	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Chlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Ethylbenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
m&p-Xylene	ND	ug/L	2.0		1	03/01/19	03/01/19 14:23	1011
Styrene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
o-Xylene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
1,2,3-Trichloropropane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	5.0		1	03/01/19	03/01/19 14:23	1011
Naphthalene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:23	1011
Iodomethane	ND	ug/L	20		1	03/01/19	03/01/19 14:23	1011

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CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-4 **Date/Time Sampled: 02/25/2019 10:45** **PSS Sample ID: 19022602-004**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Turbidity — Analytical Method: EPA 180.1

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Turbidity	ND	NTU	0.50		1	02/26/19	02/26/19 15:57	1061

Total Metals (22 & Hardness) — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	ug/L	5.0		1	02/27/19	02/27/19 17:59	1064
Arsenic	ND	ug/L	1.0		1	02/27/19	02/27/19 17:59	1064
Barium	**27.8**	ug/L	1.00		1	02/27/19	02/27/19 17:59	1064
Beryllium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:59	1064
Cadmium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:59	1064
Calcium	**9,680**	ug/L	100		1	02/27/19	02/27/19 17:59	1064
Chromium	**1.6**	ug/L	1.0		1	02/27/19	02/27/19 17:59	1064
Cobalt	ND	ug/L	1.0		1	02/27/19	02/27/19 17:59	1064
Copper	ND	ug/L	1.0		1	02/27/19	02/27/19 17:59	1064
Iron	ND	ug/L	100		1	02/27/19	02/27/19 17:59	1064
Lead	ND	ug/L	1.0		1	02/27/19	02/27/19 17:59	1064
Magnesium	**3,050**	ug/L	100		1	02/27/19	02/27/19 17:59	1064
Manganese	**30.2**	ug/L	1.00		1	02/27/19	02/27/19 17:59	1064
Mercury	ND	ug/L	0.20		1	02/27/19	02/27/19 17:59	1064
Nickel	**2.2**	ug/L	1.0		1	02/27/19	02/27/19 17:59	1064
Potassium	**2,240**	ug/L	100		1	02/27/19	02/27/19 17:59	1064
Selenium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:59	1064
Silver	ND	ug/L	1.0		1	02/27/19	02/27/19 17:59	1064
Sodium	**5,640**	ug/L	100		1	02/27/19	02/27/19 17:59	1064
Thallium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:59	1064
Vanadium	ND	ug/L	1.0		1	02/27/19	02/27/19 17:59	1064
Zinc	**23.1**	ug/L	20.0		1	02/27/19	02/27/19 17:59	1064
Hardness (Ca & Mg)	**37**	mg/L	0.66		1	02/27/19	02/27/19 17:59	1064

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CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-4 **Date/Time Sampled: 02/25/2019 10:45** **PSS Sample ID: 19022602-004**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Chloride, Sulfate & Nitrate — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloride	**10**	mg/L	5.0		1	02/26/19	02/26/19 14:28	1053
Nitrate (as N)	**10**	mg/L	0.10		1	02/26/19	02/26/19 14:28	1053
Sulfate	ND	mg/L	5.0		1	02/26/19	02/26/19 14:28	1053

Alkalinity Low Level — Analytical Method: SM 2320B -11

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Alkalinity, Total (as CaCO3)	**1.1**	mg/L	1.0		1	02/28/19	02/28/19 15:37	1053

Conductivity — Analytical Method: SM 2510B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Conductivity	**130**	us/cm	10		1	02/26/19	02/26/19 13:17	1061

Total Dissolved Solids (TDS) — Analytical Method: SM 2540C -2011 — Preparation Method: SM2540C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Total Dissolved Solids	**99**	mg/L	10		1	02/26/19	02/27/19 11:00	1061

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
pH	**5.5**	S.U.			1	02/26/19	02/26/19 13:14	1061

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	02/27/19	02/27/19 13:47	1053

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-4 **Date/Time Sampled: 02/25/2019 10:45** **PSS Sample ID: 19022602-004**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Chemical Oxygen Demand — Analytical Method: SM 5220D -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	mg/L	5.0		1	02/27/19	02/27/19 14:43	1053

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CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-4 **Date/Time Sampled: 02/25/2019 10:45** **PSS Sample ID: 19022602-004**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Vinyl chloride	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Bromomethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Chloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Acetone	ND	ug/L	10		1	03/01/19	03/01/19 14:43	1011
Cyclohexane	ND	ug/L	10		1	03/01/19	03/01/19 14:43	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/01/19	03/01/19 14:43	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Methylene chloride	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Vinyl acetate	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/01/19	03/01/19 14:43	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Bromochloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Chloroform	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Carbon tetrachloride	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Benzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Dibromomethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Methyl Acetate	ND	ug/L	10		1	03/01/19	03/01/19 14:43	1011
Acrylonitrile	ND	ug/L	10		1	03/01/19	03/01/19 14:43	1011
Trichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Carbon Disulfide	ND	ug/L	10		1	03/01/19	03/01/19 14:43	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-4 **Date/Time Sampled: 02/25/2019 10:45** **PSS Sample ID: 19022602-004**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	03/01/19	03/01/19 14:43	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Toluene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
2-Hexanone (MBK)	ND	ug/L	5.0		1	03/01/19	03/01/19 14:43	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Bromoform	ND	ug/L	5.0		1	03/01/19	03/01/19 14:43	1011
trans-1,4-dichloro-2-butene	ND	ug/L	5.0		1	03/01/19	03/01/19 14:43	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Chlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Ethylbenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
m&p-Xylene	ND	ug/L	2.0		1	03/01/19	03/01/19 14:43	1011
Styrene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
o-Xylene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
1,2,3-Trichloropropane	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	5.0		1	03/01/19	03/01/19 14:43	1011
Naphthalene	ND	ug/L	1.0		1	03/01/19	03/01/19 14:43	1011
Iodomethane	ND	ug/L	20		1	03/01/19	03/01/19 14:43	1011

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CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-5 **Date/Time Sampled: 02/25/2019 10:10** **PSS Sample ID: 19022602-005**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Turbidity — Analytical Method: EPA 180.1

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Turbidity	**1.0**	NTU	0.50		1	02/26/19	02/26/19 15:57	1061

Total Metals (22 & Hardness) — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	ug/L	5.0		1	02/27/19	02/27/19 18:04	1064
Arsenic	ND	ug/L	1.0		1	02/27/19	02/27/19 18:04	1064
Barium	**14.6**	ug/L	1.00		1	02/27/19	02/27/19 18:04	1064
Beryllium	ND	ug/L	1.0		1	02/27/19	02/27/19 18:04	1064
Cadmium	ND	ug/L	1.0		1	02/27/19	02/27/19 18:04	1064
Calcium	**4,850**	ug/L	100		1	02/27/19	02/27/19 18:04	1064
Chromium	**3.4**	ug/L	1.0		1	02/27/19	02/27/19 18:04	1064
Cobalt	**1.2**	ug/L	1.0		1	02/27/19	02/27/19 18:04	1064
Copper	ND	ug/L	1.0		1	02/27/19	02/27/19 18:04	1064
Iron	ND	ug/L	100		1	02/27/19	02/27/19 18:04	1064
Lead	ND	ug/L	1.0		1	02/27/19	02/27/19 18:04	1064
Magnesium	**2,670**	ug/L	100		1	02/27/19	02/27/19 18:04	1064
Manganese	**64.7**	ug/L	1.00		1	02/27/19	02/27/19 18:04	1064
Mercury	ND	ug/L	0.20		1	02/27/19	02/27/19 18:04	1064
Nickel	**2.1**	ug/L	1.0		1	02/27/19	02/27/19 18:04	1064
Potassium	**2,150**	ug/L	100		1	02/27/19	02/27/19 18:04	1064
Selenium	ND	ug/L	1.0		1	02/27/19	02/27/19 18:04	1064
Silver	ND	ug/L	1.0		1	02/27/19	02/27/19 18:04	1064
Sodium	**3,160**	ug/L	100		1	02/27/19	02/27/19 18:04	1064
Thallium	ND	ug/L	1.0		1	02/27/19	02/27/19 18:04	1064
Vanadium	ND	ug/L	1.0		1	02/27/19	02/27/19 18:04	1064
Zinc	**21.1**	ug/L	20.0		1	02/27/19	02/27/19 18:04	1064
Hardness (Ca & Mg)	**23**	mg/L	0.66		1	02/27/19	02/27/19 18:04	1064

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-5 **Date/Time Sampled: 02/25/2019 10:10** **PSS Sample ID: 19022602-005**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Chloride, Sulfate & Nitrate — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloride	ND	mg/L	5.0		1	02/26/19	02/26/19 14:51	1053
Nitrate (as N)	**4.5**	mg/L	0.10		1	02/26/19	02/26/19 14:51	1053
Sulfate	ND	mg/L	5.0		1	02/26/19	02/26/19 14:51	1053

Alkalinity Low Level — Analytical Method: SM 2320B -11

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Alkalinity, Total (as CaCO3)	**7.7**	mg/L	1.0		1	02/28/19	02/28/19 15:37	1053

Conductivity — Analytical Method: SM 2510B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Conductivity	**75**	us/cm	10		1	02/26/19	02/26/19 13:17	1061

Total Dissolved Solids (TDS) — Analytical Method: SM 2540C -2011 — Preparation Method: SM2540C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Total Dissolved Solids	**46**	mg/L	10		1	02/26/19	02/27/19 11:00	1061

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
pH	**6.0**	S.U.			1	02/26/19	02/26/19 13:14	1061

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	02/27/19	02/27/19 13:51	1053

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CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-5 **Date/Time Sampled: 02/25/2019 10:10** **PSS Sample ID: 19022602-005**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Chemical Oxygen Demand — Analytical Method: SM 5220D -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	mg/L	5.0		1	02/27/19	02/27/19 14:43	1053

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CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-5 **Date/Time Sampled: 02/25/2019 10:10** **PSS Sample ID: 19022602-005**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Vinyl chloride	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Bromomethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Chloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Acetone	ND	ug/L	10		1	03/01/19	03/01/19 15:04	1011
Cyclohexane	ND	ug/L	10		1	03/01/19	03/01/19 15:04	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	03/01/19	03/01/19 15:04	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Methylene chloride	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Vinyl acetate	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
2-Butanone (MEK)	ND	ug/L	10		1	03/01/19	03/01/19 15:04	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Bromochloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Chloroform	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Carbon tetrachloride	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Benzene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Dibromomethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Methyl Acetate	ND	ug/L	10		1	03/01/19	03/01/19 15:04	1011
Acrylonitrile	ND	ug/L	10		1	03/01/19	03/01/19 15:04	1011
Trichloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Carbon Disulfide	ND	ug/L	10		1	03/01/19	03/01/19 15:04	1011
Bromodichloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19022602

Earth Data, Inc, Centreville, MD

March 5, 2019

Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID: 4697D

Sample ID: MW-5 **Date/Time Sampled: 02/25/2019 10:10** **PSS Sample ID: 19022602-005**
Matrix: GROUND WATER **Date/Time Received: 02/26/2019 08:46**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	03/01/19	03/01/19 15:04	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Toluene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
2-Hexanone (MBK)	ND	ug/L	5.0		1	03/01/19	03/01/19 15:04	1011
1,2-Dibromoethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Dibromochloromethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Bromoform	ND	ug/L	5.0		1	03/01/19	03/01/19 15:04	1011
trans-1,4-dichloro-2-butene	ND	ug/L	5.0		1	03/01/19	03/01/19 15:04	1011
Tetrachloroethene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Chlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Ethylbenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
m&p-Xylene	ND	ug/L	2.0		1	03/01/19	03/01/19 15:04	1011
Styrene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
o-Xylene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
1,2,3-Trichloropropane	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Isopropylbenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
1,2-Dibromo-3-chloropropane	ND	ug/L	5.0		1	03/01/19	03/01/19 15:04	1011
Naphthalene	ND	ug/L	1.0		1	03/01/19	03/01/19 15:04	1011
Iodomethane	ND	ug/L	20		1	03/01/19	03/01/19 15:04	1011

Case Narrative Summary

Client Name: Earth Data, Inc

Project Name: Dulin Landfill

Work Order Number(s): 19022602

Project ID: 4697D

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

Analytical:

Volatile Organic Compounds MDE List

Batch: 162012

Laboratory control sample exceedances identified; see LCS summary form.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

Analytical Data Package Information Summary

Work Order(s): 19022602
Report Prepared For: Earth Data, Inc, Centreville, MD
Project Name: Dulin Landfill
Project Manager: J.P. Stokes

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 180.1	MW-1	Initial	19022602-001	1061	W	161849	161849	02/25/2019	02/26/2019 15:57	02/26/2019 15:57
	MW-2	Initial	19022602-002	1061	W	161849	161849	02/25/2019	02/26/2019 15:57	02/26/2019 15:57
	MW-3	Initial	19022602-003	1061	W	161849	161849	02/25/2019	02/26/2019 15:57	02/26/2019 15:57
	MW-4	Initial	19022602-004	1061	W	161849	161849	02/25/2019	02/26/2019 15:57	02/26/2019 15:57
	MW-5	Initial	19022602-005	1061	W	161849	161849	02/25/2019	02/26/2019 15:57	02/26/2019 15:57
	161849-1-BLK	BLK	161849-1-BLK	1061	W	161849	161849	--------	02/26/2019 15:57	02/26/2019 15:57
	MW-1 D	MD	19022602-001 D	1061	W	161849	161849	02/25/2019	02/26/2019 15:57	02/26/2019 15:57
EPA 200.8	MW-1	Initial	19022602-001	1064	W	75627	161936	02/25/2019	02/27/2019 12:08	02/27/2019 17:33
	MW-2	Initial	19022602-002	1064	W	75627	161936	02/25/2019	02/27/2019 12:08	02/27/2019 17:49
	MW-3	Initial	19022602-003	1064	W	75627	161936	02/25/2019	02/27/2019 12:08	02/27/2019 17:54
	MW-4	Initial	19022602-004	1064	W	75627	161936	02/25/2019	02/27/2019 12:08	02/27/2019 17:59
	MW-5	Initial	19022602-005	1064	W	75627	161936	02/25/2019	02/27/2019 12:08	02/27/2019 18:04
	75627-1-BKS	BKS	75627-1-BKS	1064	W	75627	161936	--------	02/27/2019 12:08	02/27/2019 17:28
	75627-1-BLK	BLK	75627-1-BLK	1064	W	75627	161936	--------	02/27/2019 12:08	02/27/2019 17:23
	MW-1 S	MS	19022602-001 S	1064	W	75627	161936	02/25/2019	02/27/2019 12:08	02/27/2019 17:38
	MW-1 S	Reanalysis	19022602-001 S	1064	W	75627	161936	02/25/2019	02/27/2019 12:08	02/27/2019 17:38
	MW-1 SD	MSD	19022602-001 SD	1064	W	75627	161936	02/25/2019	02/27/2019 12:08	02/27/2019 17:44
	MW-1 SD	Reanalysis	19022602-001 SD	1064	W	75627	161936	02/25/2019	02/27/2019 12:08	02/27/2019 17:44
	MW-1	Reanalysis	19022602-001	1064	W	75627	162007	02/25/2019	02/27/2019 12:08	03/01/2019 14:58
EPA 300.0	MW-1	Initial	19022602-001	1053	W	75600	161901	02/25/2019	02/26/2019 11:10	02/26/2019 12:59
	MW-2	Initial	19022602-002	1053	W	75600	161901	02/25/2019	02/26/2019 11:10	02/26/2019 13:43
	MW-3	Initial	19022602-003	1053	W	75600	161901	02/25/2019	02/26/2019 11:10	02/26/2019 14:06
	MW-4	Initial	19022602-004	1053	W	75600	161901	02/25/2019	02/26/2019 11:10	02/26/2019 14:28
	MW-5	Initial	19022602-005	1053	W	75600	161901	02/25/2019	02/26/2019 11:10	02/26/2019 14:51
	75600-1-BKS	BKS	75600-1-BKS	1053	W	75600	161901	--------	02/26/2019 11:10	02/26/2019 11:51
	75600-1-BLK	BLK	75600-1-BLK	1053	W	75600	161901	--------	02/26/2019 11:10	02/26/2019 11:29
	75600-1-BSD	BSD	75600-1-BSD	1053	W	75600	161901	--------	02/26/2019 11:10	02/26/2019 12:14
	MW-1 S	MS	19022602-001 S	1053	W	75600	161901	02/25/2019	02/26/2019 11:10	02/26/2019 13:21

Analytical Data Package Information Summary

Work Order(s): 19022602
Report Prepared For: Earth Data, Inc, Centreville, MD
Project Name: Dulin Landfill
Project Manager: J.P. Stokes

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SM 2320B -11	MW-1	Initial	19022602-001	1053	W	161951	161951	02/25/2019	02/28/2019 15:37	02/28/2019 15:37
	MW-2	Initial	19022602-002	1053	W	161951	161951	02/25/2019	02/28/2019 15:37	02/28/2019 15:37
	MW-3	Initial	19022602-003	1053	W	161951	161951	02/25/2019	02/28/2019 15:37	02/28/2019 15:37
	MW-4	Initial	19022602-004	1053	W	161951	161951	02/25/2019	02/28/2019 15:37	02/28/2019 15:37
	MW-5	Initial	19022602-005	1053	W	161951	161951	02/25/2019	02/28/2019 15:37	02/28/2019 15:37
	161951-1-LCS	BKS	161951-1-LCS	1053	W	161951	161951	--------	02/28/2019 15:37	02/28/2019 15:37
	161951-1-BLK	BLK	161951-1-BLK	1053	W	161951	161951	--------	02/28/2019 15:37	02/28/2019 15:37
	MW-1 D	MD	19022602-001 D	1053	W	161951	161951	02/25/2019	02/28/2019 15:37	02/28/2019 15:37
SM 2510B -2011	MW-1	Initial	19022602-001	1061	W	161826	161826	02/25/2019	02/26/2019 13:17	02/26/2019 13:17
	MW-2	Initial	19022602-002	1061	W	161826	161826	02/25/2019	02/26/2019 13:17	02/26/2019 13:17
	MW-3	Initial	19022602-003	1061	W	161826	161826	02/25/2019	02/26/2019 13:17	02/26/2019 13:17
	MW-4	Initial	19022602-004	1061	W	161826	161826	02/25/2019	02/26/2019 13:17	02/26/2019 13:17
	MW-5	Initial	19022602-005	1061	W	161826	161826	02/25/2019	02/26/2019 13:17	02/26/2019 13:17
	161826-1-BKS	BKS	161826-1-BKS	1061	W	161826	161826	--------	02/26/2019 13:17	02/26/2019 13:17
	MW-1 D	MD	19022602-001 D	1061	W	161826	161826	02/25/2019	02/26/2019 13:17	02/26/2019 13:17
SM 2540C -2011	MW-1	Initial	19022602-001	1061	W	75606	161868	02/25/2019	02/26/2019 17:49	02/27/2019 11:00
	MW-2	Initial	19022602-002	1061	W	75606	161868	02/25/2019	02/26/2019 17:49	02/27/2019 11:00
	MW-3	Initial	19022602-003	1061	W	75606	161868	02/25/2019	02/26/2019 17:49	02/27/2019 11:00
	MW-4	Initial	19022602-004	1061	W	75606	161868	02/25/2019	02/26/2019 17:49	02/27/2019 11:00
	MW-5	Initial	19022602-005	1061	W	75606	161868	02/25/2019	02/26/2019 17:49	02/27/2019 11:00
	75606-1-LCS	BKS	75606-1-LCS	1061	W	75606	161868	--------	02/26/2019 17:49	02/27/2019 11:00
	BLK	BLK	75606-1-BLK	1061	W	75606	161868	--------	02/26/2019 17:49	02/27/2019 11:00
	MW-1 D	MD	19022602-001 D	1061	W	75606	161868	02/25/2019	02/26/2019 17:49	02/27/2019 11:00
SM 4500-H+ B -2011	MW-1	Initial	19022602-001	1061	W	161825	161825	02/25/2019	02/26/2019 13:14	02/26/2019 13:14
	MW-2	Initial	19022602-002	1061	W	161825	161825	02/25/2019	02/26/2019 13:14	02/26/2019 13:14
	MW-3	Initial	19022602-003	1061	W	161825	161825	02/25/2019	02/26/2019 13:14	02/26/2019 13:14
	MW-4	Initial	19022602-004	1061	W	161825	161825	02/25/2019	02/26/2019 13:14	02/26/2019 13:14
	MW-5	Initial	19022602-005	1061	W	161825	161825	02/25/2019	02/26/2019 13:14	02/26/2019 13:14

Analytical Data Package Information Summary

Work Order(s): 19022602
Report Prepared For: Earth Data, Inc, Centreville, MD
Project Name: Dulin Landfill
Project Manager: J.P. Stokes

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SM 4500-H+ B -2011	MW-1 D	MD	19022602-001 D	1061	W	161825	161825	02/25/2019	02/26/2019 13:14	02/26/2019 13:14
SM 4500-NH3-F -2011	MW-1	Initial	19022602-001	1053	W	75619	161902	02/25/2019	02/27/2019 10:30	02/27/2019 13:27
	MW-2	Initial	19022602-002	1053	W	75619	161902	02/25/2019	02/27/2019 10:30	02/27/2019 13:39
	MW-3	Initial	19022602-003	1053	W	75619	161902	02/25/2019	02/27/2019 10:30	02/27/2019 13:43
	MW-4	Initial	19022602-004	1053	W	75619	161902	02/25/2019	02/27/2019 10:30	02/27/2019 13:47
	MW-5	Initial	19022602-005	1053	W	75619	161902	02/25/2019	02/27/2019 10:30	02/27/2019 13:51
	75619-1-BKS	BKS	75619-1-BKS	1053	W	75619	161902	--------	02/27/2019 10:30	02/27/2019 13:19
	75619-1-BLK	BLK	75619-1-BLK	1053	W	75619	161902	--------	02/27/2019 10:30	02/27/2019 13:15
	75619-1-BSD	BSD	75619-1-BSD	1053	W	75619	161902	--------	02/27/2019 10:30	02/27/2019 13:23
	MW-1 S	MS	19022602-001 S	1053	W	75619	161902	02/25/2019	02/27/2019 10:30	02/27/2019 13:31
	MW-1 SD	MSD	19022602-001 SD	1053	W	75619	161902	02/25/2019	02/27/2019 10:30	02/27/2019 13:35
SM 5220D -2011	MW-1	Initial	19022602-001	1053	W	161896	161896	02/25/2019	02/27/2019 14:43	02/27/2019 14:43
	MW-2	Initial	19022602-002	1053	W	161896	161896	02/25/2019	02/27/2019 14:43	02/27/2019 14:43
	MW-3	Initial	19022602-003	1053	W	161896	161896	02/25/2019	02/27/2019 14:43	02/27/2019 14:43
	MW-4	Initial	19022602-004	1053	W	161896	161896	02/25/2019	02/27/2019 14:43	02/27/2019 14:43
	MW-5	Initial	19022602-005	1053	W	161896	161896	02/25/2019	02/27/2019 14:43	02/27/2019 14:43
	161896-1-BKS	BKS	161896-1-BKS	1053	W	161896	161896	--------	02/27/2019 14:43	02/27/2019 14:43
	161896-1-BLK	BLK	161896-1-BLK	1053	W	161896	161896	--------	02/27/2019 14:43	02/27/2019 14:43
	MW-1 S	MS	19022602-001 S	1053	W	161896	161896	02/25/2019	02/27/2019 14:43	02/27/2019 14:43
	MW-1 SD	MSD	19022602-001 SD	1053	W	161896	161896	02/25/2019	02/27/2019 14:43	02/27/2019 14:43
SW-846 8260 B	MW-1	Initial	19022602-001	1011	W	75685	162012	02/25/2019	03/01/2019 08:28	03/01/2019 13:41
	MW-2	Initial	19022602-002	1011	W	75685	162012	02/25/2019	03/01/2019 08:28	03/01/2019 14:02
	MW-3	Initial	19022602-003	1011	W	75685	162012	02/25/2019	03/01/2019 08:28	03/01/2019 14:23
	MW-4	Initial	19022602-004	1011	W	75685	162012	02/25/2019	03/01/2019 08:28	03/01/2019 14:43
	MW-5	Initial	19022602-005	1011	W	75685	162012	02/25/2019	03/01/2019 08:28	03/01/2019 15:04
	75685-1-BKS	BKS	75685-1-BKS	1011	W	75685	162012	--------	03/01/2019 08:28	03/01/2019 09:32
	75685-1-BLK	BLK	75685-1-BLK	1011	W	75685	162012	--------	03/01/2019 08:28	03/01/2019 10:34
	DW S	MS	19022517-001 S	1011	W	75685	162012	02/22/2019	03/01/2019 08:28	03/01/2019 15:25

Analytical Data Package Information Summary

Work Order(s): 19022602
Report Prepared For: Earth Data, Inc, Centreville, MD
Project Name: Dulin Landfill
Project Manager: J.P. Stokes

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8260 B	DW SD	MSD	19022517-001 SD	1011	W	75685	162012	02/22/2019	03/01/2019 08:28	03/01/2019 15:46

PHASE SEPARATION SCIENCE, INC.

QC Summary 19022602

Earth Data, Inc
Dulin Landfill

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 162012 Matrix: Ground Water Date Prep: 03/01/2019
PSS Sample ID: 19022602-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	90		87-109	%	03/01/19 13:41
Dibromofluoromethane	99		93-111	%	03/01/19 13:41
Toluene-D8	91		91-109	%	03/01/19 13:41

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 162012 Matrix: Ground Water Date Prep: 03/01/2019
PSS Sample ID: 19022602-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	96		87-109	%	03/01/19 14:02
Dibromofluoromethane	102		93-111	%	03/01/19 14:02
Toluene-D8	93		91-109	%	03/01/19 14:02

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 162012 Matrix: Ground Water Date Prep: 03/01/2019
PSS Sample ID: 19022602-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	89		87-109	%	03/01/19 14:23
Dibromofluoromethane	105		93-111	%	03/01/19 14:23
Toluene-D8	92		91-109	%	03/01/19 14:23

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 162012 Matrix: Ground Water Date Prep: 03/01/2019
PSS Sample ID: 19022602-004

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	92		87-109	%	03/01/19 14:43
Dibromofluoromethane	101		93-111	%	03/01/19 14:43
Toluene-D8	99		91-109	%	03/01/19 14:43

PHASE SEPARATION SCIENCE, INC.

QC Summary 19022602

Earth Data, Inc
Dulin Landfill

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 162012 Matrix: Ground Water Date Prep: 03/01/2019
PSS Sample ID: 19022602-005

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	93		87-109	%	03/01/19 15:04
Dibromofluoromethane	104		93-111	%	03/01/19 15:04
Toluene-D8	96		91-109	%	03/01/19 15:04

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 19022602

Earth Data, Inc
Dulin Landfill

Analytical Method: EPA 180.1
Seq Number: 161849 Matrix: Water
MB Sample Id: 161849-1-BLK

Parameter	MB Result	LOD	RL	Units	Analysis Date	Flag
Turbidity	ND	0.5000	0.5000	NTU	02/26/19 15:57	

Analytical Method: EPA 180.1
Seq Number: 161849 Matrix: Ground Water
Parent Sample Id: 19022602-001 MD Sample Id: 19022602-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Turbidity	<0.5000	<0.5000	0	20	NTU	02/26/19 15:57	U

Analytical Method: SM 2320B -11
Seq Number: 161951 Matrix: Water
MB Sample Id: 161951-1-LCS LCS Sample Id: 161951-1-LCS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Alkalinity, Total (as CaCO3)	<1.0	6.000	6.000	100	80-120	mg/L	02/28/19 15:37	

Analytical Method: SM 2320B -11
Seq Number: 161951 Matrix: Ground Water
Parent Sample Id: 19022602-001 MD Sample Id: 19022602-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Alkalinity, Total (as CaCO3)	1.200	1.000	18	30	mg/L	02/28/19 15:37	

Analytical Method: SM 2510B -2011
Seq Number: 161826 Matrix: Ground Water
Parent Sample Id: 19022602-001 MD Sample Id: 19022602-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Conductivity	182.9	183.3	0	20	us/cm	02/26/19 13:17	

Analytical Method: SM 2540C -2011 Prep Method: SM2540C_Prep
Seq Number: 161868 Matrix: Water Date Prep: 02/26/19
MB Sample Id: 75606-1-LCS LCS Sample Id: 75606-1-LCS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Total Dissolved Solids	<10	500	513	103	80-120	mg/L	02/27/19 11:00	

PHASE SEPARATION SCIENCE, INC.

QC Summary 19022602

Earth Data, Inc
Dulin Landfill

Analytical Method: SM 2540C -2011 Prep Method: SM2540C_Prep
Seq Number: 161868 Matrix: Water Date Prep: 02/26/19
MB Sample Id: 75606-1-BLK

Parameter	MB Result	LOD	RL	Units	Analysis Date	Flag
Total Dissolved Solids	ND	10.00	10.00	mg/L	02/27/19 11:00	

Analytical Method: SM 2540C -2011 Prep Method: SM2540C_Prep
Seq Number: 161868 Matrix: Ground Water Date Prep: 02/26/19
Parent Sample Id: 19022602-001 MD Sample Id: 19022602-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Total Dissolved Solids	130	127	2	10	mg/L	02/27/19 11:00	

Analytical Method: SM 4500-H+ B -2011
Seq Number: 161825 Matrix: Ground Water
Parent Sample Id: 19022602-001 MD Sample Id: 19022602-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
pH	5.513	5.500	0	20	S.U.	02/26/19 13:14	

Analytical Method: SM 4500-NH3-F -2011 Prep Method: SM4500-NH3B
Seq Number: 161902 Matrix: Water Date Prep: 02/27/19
MB Sample Id: 75619-1-BLK LCS Sample Id: 75619-1-BKS LCSD Sample Id: 75619-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Nitrogen, Ammonia (as N)	<0.2000	2.500	2.376	95	2.434	97	85-115	2	20	mg/L	02/27/19 13:19	

Analytical Method: SM 4500-NH3-F -2011 Prep Method: SM4500-NH3B
Seq Number: 161902 Matrix: Ground Water Date Prep: 02/27/19
Parent Sample Id: 19022602-001 MS Sample Id: 19022602-001 S MSD Sample Id: 19022602-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Nitrogen, Ammonia (as N)	<0.2000	2.500	2.439	98	2.331	93	80-120	5	20	mg/L	02/27/19 13:31	

Analytical Method: SM 5220D -2011
Seq Number: 161896 Matrix: Water
MB Sample Id: 161896-1-BLK LCS Sample Id: 161896-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Chemical Oxygen Demand	<5.000	100.4	102	102	85-115	mg/L	02/27/19 14:43	

PHASE SEPARATION SCIENCE, INC.

QC Summary 19022602

Earth Data, Inc
Dulin Landfill

Analytical Method: SM 5220D -2011

Seq Number: 161896 Matrix: Ground Water

Parent Sample Id: 19022602-001 MS Sample Id: 19022602-001 S MSD Sample Id: 19022602-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chemical Oxygen Demand	<5.000	50.20	53.00	106	57.00	114	80-120	7	20	mg/L	02/27/19 14:43	

Analytical Method: EPA 200.8

Prep Method: E200.8_PREP

Seq Number: 161936 Matrix: Water

Date Prep: 02/27/19

MB Sample Id: 75627-1-BLK LCS Sample Id: 75627-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Antimony	<5.000	40.00	42.19	105	85-115	ug/L	02/27/19 17:28	
Arsenic	<1.000	40.00	36.79	92	85-115	ug/L	02/27/19 17:28	
Barium	<1.000	40.00	38.60	97	85-115	ug/L	02/27/19 17:28	
Beryllium	<1.000	40.00	41.63	104	85-115	ug/L	02/27/19 17:28	
Cadmium	<1.000	40.00	37.25	93	85-115	ug/L	02/27/19 17:28	
Calcium	<100	400	355.5	89	85-115	ug/L	02/27/19 17:28	
Chromium	<1.000	40.00	37.46	94	85-115	ug/L	02/27/19 17:28	
Cobalt	<1.000	40.00	40.23	101	85-115	ug/L	02/27/19 17:28	
Copper	<1.000	40.00	38.37	96	85-115	ug/L	02/27/19 17:28	
Iron	<100	400	376	94	85-115	ug/L	02/27/19 17:28	
Lead	<1.000	40.00	40.27	101	85-115	ug/L	02/27/19 17:28	
Magnesium	<100	400	385.8	96	85-115	ug/L	02/27/19 17:28	
Manganese	<1.000	40.00	40.14	100	85-115	ug/L	02/27/19 17:28	
Mercury	<0.2000	1.000	0.9380	94	85-115	ug/L	02/27/19 17:28	
Nickel	<1.000	40.00	38.13	95	85-115	ug/L	02/27/19 17:28	
Potassium	<100	400	362.2	91	85-115	ug/L	02/27/19 17:28	
Selenium	<1.000	40.00	34.63	87	85-115	ug/L	02/27/19 17:28	
Silver	<1.000	40.00	37.00	93	85-115	ug/L	02/27/19 17:28	
Sodium	<100	400	372.2	93	85-115	ug/L	02/27/19 17:28	
Thallium	<1.000	40.00	40.53	101	85-115	ug/L	02/27/19 17:28	
Vanadium	<1.000	40.00	34.93	87	85-115	ug/L	02/27/19 17:28	
Zinc	<20.00	200	193.8	97	85-115	ug/L	02/27/19 17:28	

Analytical Method: EPA 200.8

Prep Method: E200.8_PREP

Seq Number: 161936 Matrix: Water

Date Prep: 02/27/19

MB Sample Id: 75627-1-BLK

Parameter	MB Result	LOD	RL	Units	Analysis Date	Flag
Hardness (Ca & Mg)	ND	0.7000	0.7000	mg/L	02/27/19 17:23	

PHASE SEPARATION SCIENCE, INC.

QC Summary 19022602

Earth Data, Inc
Dulin Landfill

Analytical Method: EPA 200.8 | Prep Method: E200.8_PREP
Seq Number: 161936 | Matrix: Ground Water | Date Prep: 02/27/19
Parent Sample Id: 19022602-001 | MS Sample Id: 19022602-001 S | MSD Sample Id: 19022602-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Antimony	<5.000	40.00	42.27	106	41.84	105	70-130	1	25	ug/L	02/27/19 17:38	
Arsenic	<1.000	40.00	39.70	99	38.25	96	70-130	4	25	ug/L	02/27/19 17:38	
Barium	73.54	40.00	109.5	90	108.9	88	70-130	1	25	ug/L	02/27/19 17:38	
Beryllium	<1.000	40.00	41.88	105	41.07	103	70-130	2	25	ug/L	02/27/19 17:38	
Cadmium	<1.000	40.00	39.73	99	39.03	98	70-130	2	25	ug/L	02/27/19 17:38	
Calcium	11190	400	11850	165	12140	238	70-130	2	25	ug/L	02/27/19 17:38	X
Chromium	1.600	40.00	41.60	100	40.77	98	70-130	2	25	ug/L	02/27/19 17:38	
Cobalt	<1.000	40.00	40.70	102	40.33	101	70-130	1	25	ug/L	02/27/19 17:38	
Copper	<1.000	40.00	40.01	100	39.30	98	70-130	2	25	ug/L	02/27/19 17:38	
Iron	<100	400	431.8	108	438.6	110	70-130	2	25	ug/L	02/27/19 17:38	
Lead	<1.000	40.00	39.78	99	39.55	99	70-130	1	25	ug/L	02/27/19 17:38	
Magnesium	5110	400	5490	95	5446	84	70-130	1	25	ug/L	02/27/19 17:38	
Manganese	18.10	40.00	57.69	99	57.47	98	70-130	0	25	ug/L	02/27/19 17:38	
Mercury	<0.2000	1.000	0.9700	97	0.9770	98	70-130	1	25	ug/L	02/27/19 17:38	
Nickel	5.060	40.00	45.09	100	44.11	98	70-130	2	25	ug/L	02/27/19 17:38	
Potassium	3342	400	3716	94	3678	84	70-130	1	25	ug/L	02/27/19 17:38	
Selenium	<1.000	40.00	35.05	88	35.75	89	70-130	2	25	ug/L	02/27/19 17:38	
Silver	<1.000	40.00	37.08	93	37.25	93	70-130	0	25	ug/L	02/27/19 17:38	
Sodium	11170	400	11490	80	11400	58	70-130	1	25	ug/L	02/27/19 17:38	X
Thallium	<1.000	40.00	40.44	101	39.87	100	70-130	1	25	ug/L	02/27/19 17:38	
Vanadium	<1.000	40.00	38.51	96	37.89	95	70-130	2	25	ug/L	02/27/19 17:38	
Zinc	26.91	200	231.2	102	229.4	101	70-130	1	25	ug/L	02/27/19 17:38	

Analytical Method: EPA 300.0 | Prep Method: E300.0P
Seq Number: 161901 | Matrix: Water | Date Prep: 02/26/19
MB Sample Id: 75600-1-BLK | LCS Sample Id: 75600-1-BKS | LCSD Sample Id: 75600-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.000	50.00	49.24	98	48.48	97	90-110	2	20	mg/L	02/26/19 11:51	
Nitrate (as N)	<0.1000	5.000	4.481	90	4.848	97	90-110	8	20	mg/L	02/26/19 11:51	
Sulfate	<5.000	50.00	47.12	94	47.43	95	90-110	1	20	mg/L	02/26/19 11:51	

Analytical Method: EPA 300.0 | Prep Method: E300.0P
Seq Number: 161901 | Matrix: Ground Water | Date Prep: 02/26/19
Parent Sample Id: 19022602-001 | MS Sample Id: 19022602-001 S

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	Limits	Units	Analysis Date	Flag
Chloride	13.59	50.00	64.26	101	80-123	mg/L	02/26/19 13:21	
Nitrate (as N)	16.11	5.000	20.99	98	87-115	mg/L	02/26/19 13:21	
Sulfate	<5.000	50.00	48.94	98	80-116	mg/L	02/26/19 13:21	

PHASE SEPARATION SCIENCE, INC.

QC Summary 19022602

Earth Data, Inc
Dulin Landfill

Analytical Method: SW-846 8260 B Prep Method: SW5030B

Seq Number: 162012 Matrix: Water Date Prep: 03/01/19

MB Sample Id: 75685-1-BLK LCS Sample Id: 75685-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Chloromethane	<1.000	50.00	60.60	121	59-121	ug/L	03/01/19 09:32	
Vinyl chloride	<1.000	50.00	57.42	115	66-133	ug/L	03/01/19 09:32	
Bromomethane	<1.000	50.00	63.25	127	45-167	ug/L	03/01/19 09:32	
Chloroethane	<1.000	50.00	50.64	101	81-122	ug/L	03/01/19 09:32	
Acetone	<10.00	50.00	57.86	116	55-120	ug/L	03/01/19 09:32	
Cyclohexane	<10.00	50.00	44.86	90	83-122	ug/L	03/01/19 09:32	
Trichlorofluoromethane	<5.000	50.00	58.66	117	85-130	ug/L	03/01/19 09:32	
1,1-Dichloroethene	<1.000	50.00	52.85	106	85-123	ug/L	03/01/19 09:32	
Methylene chloride	<1.000	50.00	47.34	95	85-119	ug/L	03/01/19 09:32	
trans-1,2-Dichloroethene	<1.000	50.00	50.20	100	87-120	ug/L	03/01/19 09:32	
Methyl-t-Butyl Ether	<1.000	50.00	44.23	88	61-130	ug/L	03/01/19 09:32	
1,1-Dichloroethane	<1.000	50.00	47.21	94	85-120	ug/L	03/01/19 09:32	
Vinyl acetate	<1.000	50.00	48.96	98	62-113	ug/L	03/01/19 09:32	
2-Butanone (MEK)	<10.00	50.00	40.63	81	45-136	ug/L	03/01/19 09:32	
cis-1,2-Dichloroethene	<1.000	50.00	44.81	90	86-126	ug/L	03/01/19 09:32	
Bromochloromethane	<1.000	50.00	47.25	95	74-136	ug/L	03/01/19 09:32	
Chloroform	<1.000	50.00	40.08	80	76-129	ug/L	03/01/19 09:32	
1,1,1-Trichloroethane	<1.000	50.00	45.06	90	87-125	ug/L	03/01/19 09:32	
1,2-Dichloroethane	<1.000	50.00	41.24	82	86-125	ug/L	03/01/19 09:32	L
Carbon tetrachloride	<1.000	50.00	47.81	96	79-133	ug/L	03/01/19 09:32	
Benzene	<1.000	50.00	45.11	90	87-123	ug/L	03/01/19 09:32	
Dichlorodifluoromethane	<1.000	50.00	41.12	82	70-131	ug/L	03/01/19 09:32	
Dibromomethane	<1.000	50.00	45.21	90	80-132	ug/L	03/01/19 09:32	
1,2-Dichloropropane	<1.000	50.00	42.32	85	83-120	ug/L	03/01/19 09:32	
Methyl Acetate	<10.00	50.00	45.85	92	68-129	ug/L	03/01/19 09:32	
Acrylonitrile	<10.00	50.00	47.50	95	66-132	ug/L	03/01/19 09:32	
Trichloroethene	<1.000	50.00	46.50	93	87-124	ug/L	03/01/19 09:32	
Carbon Disulfide	<10.00	50.00	50.84	102	87-123	ug/L	03/01/19 09:32	
Bromodichloromethane	<1.000	50.00	46.28	93	83-125	ug/L	03/01/19 09:32	
cis-1,3-Dichloropropene	<1.000	50.00	43.08	86	81-125	ug/L	03/01/19 09:32	
4-Methyl-2-Pentanone (MIBK)	<5.000	50.00	38.02	76	57-116	ug/L	03/01/19 09:32	
trans-1,3-Dichloropropene	<1.000	50.00	43.06	86	79-121	ug/L	03/01/19 09:32	
1,1,2-Trichloroethane	<1.000	50.00	45.86	92	84-127	ug/L	03/01/19 09:32	
Toluene	<1.000	50.00	47.18	94	82-127	ug/L	03/01/19 09:32	
2-Hexanone (MBK)	<5.000	50.00	40.06	80	56-116	ug/L	03/01/19 09:32	
1,2-Dibromoethane	<1.000	50.00	44.82	90	80-127	ug/L	03/01/19 09:32	
Dibromochloromethane	<1.000	50.00	45.41	91	73-139	ug/L	03/01/19 09:32	
1,1,1,2-Tetrachloroethane	<1.000	50.00	49.72	99	80-133	ug/L	03/01/19 09:32	
Bromoform	<5.000	50.00	47.95	96	72-129	ug/L	03/01/19 09:32	
trans-1,4-dichloro-2-butene	<5.000	50.00	42.09	84	56-122	ug/L	03/01/19 09:32	
Tetrachloroethene	<1.000	50.00	54.29	109	85-131	ug/L	03/01/19 09:32	
Chlorobenzene	<1.000	50.00	46.65	93	87-127	ug/L	03/01/19 09:32	
Ethylbenzene	<1.000	50.00	46.85	94	82-128	ug/L	03/01/19 09:32	
m&p-Xylene	<2.000	100	87.51	88	78-126	ug/L	03/01/19 09:32	
Styrene	<1.000	50.00	44.11	88	76-130	ug/L	03/01/19 09:32	
1,1,2,2-Tetrachloroethane	<1.000	50.00	42.35	85	79-131	ug/L	03/01/19 09:32	
o-Xylene	<1.000	50.00	43.73	87	75-130	ug/L	03/01/19 09:32	
1,2,3-Trichloropropane	<1.000	50.00	42.47	85	69-130	ug/L	03/01/19 09:32	
Isopropylbenzene	<1.000	50.00	43.45	87	81-128	ug/L	03/01/19 09:32	
1,4-Dichlorobenzene	<1.000	50.00	50.38	101	84-129	ug/L	03/01/19 09:32	
1,2-Dichlorobenzene	<1.000	50.00	51.70	103	82-129	ug/L	03/01/19 09:32	

PHASE SEPARATION SCIENCE, INC.

QC Summary 19022602

Earth Data, Inc
Dulin Landfill

Analytical Method: SW-846 8260 B

Prep Method: SW5030B

Seq Number: 162012 | Matrix: Water | Date Prep: 03/01/19

MB Sample Id: 75685-1-BLK | LCS Sample Id: 75685-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
1,2-Dibromo-3-chloropropane	<5.000	50.00	37.86	76	63-140	ug/L	03/01/19 09:32	
Naphthalene	<1.000	50.00	47.94	96	74-114	ug/L	03/01/19 09:32	
Iodomethane	<20.00	50.00	82.22	164	63-113	ug/L	03/01/19 09:32	H

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	93		88		87-109	%	03/01/19 09:32
Dibromofluoromethane	100		99		93-111	%	03/01/19 09:32
Toluene-D8	95		99		91-109	%	03/01/19 09:32

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

PSS Work Order #: ~~1902260~~ 1902602 PAGE 1 OF 1

Matrix Codes: **SW**=Surface Wtr **DW**=Drinking Wtr **GW**=Ground Wtr **WW**=Waste Wtr **O**=Oil **S**=Soil **L**=Liquid **SOL**=Solid **A**=Air **WI**=Wipe

1

*CLIENT: Earth Data Inc. *OFFICE LOC.: Centreville, MD

*PROJECT MGR: JP Stokes *PHONE NO.: (410) 758 8160

EMAIL: JPStokes@EarthDataInc.com FAX NO.: (410) 758 8168

*PROJECT NAME: Dulin Landfill PROJECT NO.: 4697D

SITE LOCATION: Kent County, Chestertown, MD P.O. NO.:

SAMPLER(S): DW CERT NO.:

2

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB
1	MW-1	2/25/19	12:00	GW	10	G
2	MW-2	2/25/19	11:35	GW	10	G
3	MW-3	2/25/19	11:25	GW	10	G
4	MW-4	2/25/19	10:45	GW	10	G
5	MW-5	2/25/19	10:10	GW	10	G

Preservatives Used: HNO3 | H2SO4 | H2SO4 | — | — | — | — | HCl

Analysis/Method Required ③ *: 20 Total Metals 200.7 + Hardness | COD | Nitrogen Ammonia | Alkalinity - Low Levels | TDS | Conductivity/pH Nitrates Chlorides Sulfates | Turbidity | VOC 8260 | REMARKS

5

Relinquished By:	Date	Time	Received By:
(1)	2/26/19	07:37	
(2)	2/26/19	8:45 AM	
(3)			
(4)			

4

*Requested TAT (One TAT per COC): ☐ 5-Day ☐ 3-Day ☐ 2-Day ☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required: COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER

# of Coolers: 2

Custody Seal: ABS

Ice Present: PRES Temp: 1.9-3.8°C

Shipping Carrier: TTE

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE:

STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19022602	**Received By**	Amber Confer
Client Name	Earth Data, Inc	**Date Received**	02/26/2019 08:46:00 AM
Project Name	Dulin Landfill	**Delivered By**	Trans Time Express
Project Number	4697D	**Tracking No**	Not Applicable
Disposal Date	04/02/2019	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 2

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	3.8
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Not Provided
COC agrees with sample labels?	Yes		N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 5 Total No. of Containers Received 50

Preservation

Total Metals	(pH<2)	Yes
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	Yes
TOX, TKN, NH3, Total Phos	(pH<2)	Yes
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	Yes
Do VOA vials have zero headspace?		Yes
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 02/26/2019

Thomas Wingate

PM Review and Approval: Lynn Jackson Date: 02/26/2019

Lynn Jackson

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-108605-1
Client Project/Site: Dulin Landfill

For:
Earth Data Inc
131 Comet Drive
Centreville, Maryland 21617

Attn: JP Stokes

Authorized for release by:
3/13/2019 10:15:44 AM

Michael DelMonico, Project Manager I
(330)497-9396
michael.delmonico@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Definitions/Glossary

Client: Earth Data Inc
Project/Site: Dulin Landfill

TestAmerica Job ID: 240-108605-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
E	Result exceeded calibration range.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
E	Result exceeded calibration range.
H	Sample was prepped or analyzed beyond the specified holding time
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 240-108605-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: Earth Data Inc

Project: Dulin Landfill

Report Number: 240-108605-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 2/27/2019 10:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.0º C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples MW-1 (240-108605-1) and TRIP BLANK (240-108605-2) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260C. The samples were analyzed on 03/04/2019.

Iodomethane failed the recovery criteria high for LCS 240-370137/5. Refer to the QC report for details.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 240-370137.

The laboratory control sample (LCS) for analytical batch 240-370137 recovered outside control limits for the following analytes: Iodomethane. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

The initial calibration (ICAL) did not pass the method calibration acceptance criteria for Iodomethane. This variance only affects results measured above the reporting limit. A CCV standard at or below the reporting limit (RL) was analyzed with the samples and found to be acceptable. This demonstrates the reporting limit is valid for the affected analyte. The samples associated with the ICAL were

Job ID: 240-108605-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

non-detects for the affected analytes; therefore, the results have been reported. The following samples are impacted: MW-1 (240-108605-1) and TRIP BLANK (240-108605-2).

The continuing calibration verification (CCV) analyzed in batch 240-370137 was outside the method criteria for multiple analytes. A CCV standard at or below the reporting limit (RL) was analyzed with the affected samples and found to be acceptable. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analytes is considered estimated: MW-1 (240-108605-1), TRIP BLANK (240-108605-2) and (CCVIS 240-370137/3).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL RECOVERABLE METALS (ICPMS)
Sample MW-1 (240-108605-1) was analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The sample was prepared on 02/28/2019 and analyzed on 03/01/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY
Sample MW-1 (240-108605-1) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The sample was prepared and analyzed on 02/28/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TURBIDITY
Sample MW-1 (240-108605-1) was analyzed for turbidity in accordance with EPA Method 180.1. The sample was analyzed on 02/27/2019.

The following sample was received with less than 2 days remaining on the holding time or less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: MW-1 (240-108605-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ALKALINITY
Sample MW-1 (240-108605-1) was analyzed for alkalinity in accordance with SM 2320B. The sample was analyzed on 03/01/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

HARDNESS
Sample MW-1 (240-108605-1) was analyzed for hardness in accordance with SM 2340C. The sample was analyzed on 03/06/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CONDUCTIVITY
Sample MW-1 (240-108605-1) was analyzed for conductivity in accordance with SM 2510B. The sample was analyzed on 03/05/2019.

Resistivity was detected in method blank MB 240-370417/3 at a level exceeding the reporting limit. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS
Sample MW-1 (240-108605-1) was analyzed for total dissolved solids in accordance with SM 2540C. The sample was analyzed on 03/01/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Job ID: 240-108605-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

ANIONS

Sample MW-1 (240-108605-1) was analyzed for anions in accordance with EPA Method 300.0. The sample was analyzed on 02/27/2019 and 03/01/2019.

Sample MW-1 (240-108605-1)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The following samples was received with less than 2 days remaining on the holding time or less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: MW-1 (240-108605-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS

Sample MW-1 (240-108605-1) was analyzed for anions in accordance with EPA Method 300.0. The sample was analyzed on 02/27/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CHEMICAL OXYGEN DEMAND

Sample MW-1 (240-108605-1) was analyzed for chemical oxygen demand in accordance with SM 5220D. The sample was analyzed on 02/28/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PH

Sample MW-1 (240-108605-1) was analyzed for pH in accordance with EPA SW-846 Method 9040C. The sample was analyzed on 02/27/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

AMMONIA

Sample MW-1 (240-108605-1) was analyzed for ammonia in accordance with SM 4500 NH3 D. The sample was analyzed on 03/05/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: Earth Data Inc
Project/Site: Dulin Landfill

TestAmerica Job ID: 240-108605-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
180.1	Turbidity, Nephelometric	MCAWW	TAL CAN
2320B-2011	Alkalinity, Total	SM	TAL CAN
2340C-2011	Hardness, Total	SM	TAL CAN
2510B-2011	Conductivity, Specific Conductance	SM	TAL CAN
2540 C-2011	Total Dissolved Solids (Dried at 180 °C)	SM	TAL CAN
300.0	Anions, Ion Chromatography	MCAWW	TAL CAN
4500 NH3 D-2011	Ammonia	SM	TAL CAN
5220D-2011	Chemical Oxygen Demand	SM	TAL CAN
9040C	pH	SW846	TAL CAN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
5030C	Purge and Trap	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: Earth Data Inc
Project/Site: Dulin Landfill

TestAmerica Job ID: 240-108605-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-108605-1	MW-1	Water	02/25/19 12:05	02/27/19 10:30
240-108605-2	TRIP BLANK	Water	02/25/19 00:00	02/27/19 10:30

Detection Summary

Client: Earth Data Inc
Project/Site: Dulin Landfill

TestAmerica Job ID: 240-108605-1

Client Sample ID: MW-1 — Lab Sample ID: 240-108605-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	74		5.0	2.2	ug/L	1		6020A	Total Recoverable
Calcium	13000		1000	580	ug/L	1		6020A	Total Recoverable
Cobalt	0.77	J	1.0	0.19	ug/L	1		6020A	Total Recoverable
Chromium	2.0		2.0	0.98	ug/L	1		6020A	Total Recoverable
Iron	170		100	47	ug/L	1		6020A	Total Recoverable
Potassium	3600		1000	220	ug/L	1		6020A	Total Recoverable
Magnesium	5300		1000	200	ug/L	1		6020A	Total Recoverable
Manganese	18		5.0	2.1	ug/L	1		6020A	Total Recoverable
Sodium	11000		1000	330	ug/L	1		6020A	Total Recoverable
Nickel	4.9		2.0	1.5	ug/L	1		6020A	Total Recoverable
Zinc	22		20	15	ug/L	1		6020A	Total Recoverable
Turbidity	1.1	H	0.50	0.16	NTU	1		180.1	Total/NA
Hardness as calcium carbonate	66		5.0	2.4	mg/L	1		2340C-2011	Total/NA
Specific Conductance	200		1.0	0.61	umhos/cm	1		2510B-2011	Total/NA
Resistivity	5000	^	1.0	0.61	ohm cm	1		2510B-2011	Total/NA
Total Dissolved Solids	120		10	7.8	mg/L	1		2540 C-2011	Total/NA
Chloride	14		1.0	0.28	mg/L	1		300.0	Total/NA
Nitrate as N	17	E H	0.10	0.014	mg/L	1		300.0	Total/NA
pH	5.2		0.1	0.1	SU	1		9040C	Total/NA
Nitrate as N - RA	17	H	1.0	0.14	mg/L	10		300.0	Total/NA

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-108605-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: Earth Data Inc
Project/Site: Dulin Landfill

TestAmerica Job ID: 240-108605-1

Client Sample ID: MW-1
Date Collected: 02/25/19 12:05
Date Received: 02/27/19 10:30

Lab Sample ID: 240-108605-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		1.0	0.14	ug/L			03/04/19 14:49	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			03/04/19 14:49	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.13	ug/L			03/04/19 14:49	1
1,1,2-Trichloroethane	ND		1.0	0.090	ug/L			03/04/19 14:49	1
1,1-Dichloroethane	ND		1.0	0.17	ug/L			03/04/19 14:49	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			03/04/19 14:49	1
1,2,3-Trichloropropane	ND		1.0	0.24	ug/L			03/04/19 14:49	1
1,2-Dibromo-3-Chloropropane	ND		2.0	0.91	ug/L			03/04/19 14:49	1
1,2-Dichlorobenzene	ND		1.0	0.15	ug/L			03/04/19 14:49	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			03/04/19 14:49	1
1,2-Dichloropropane	ND		1.0	0.15	ug/L			03/04/19 14:49	1
1,4-Dichlorobenzene	ND		1.0	0.16	ug/L			03/04/19 14:49	1
2-Butanone (MEK)	ND		10	1.2	ug/L			03/04/19 14:49	1
2-Hexanone	ND		10	0.54	ug/L			03/04/19 14:49	1
4-Methyl-2-pentanone (MIBK)	ND		10	0.42	ug/L			03/04/19 14:49	1
Acetone	ND		10	5.4	ug/L			03/04/19 14:49	1
Acrylonitrile	ND		20	1.1	ug/L			03/04/19 14:49	1
Benzene	ND		1.0	0.13	ug/L			03/04/19 14:49	1
Bromoform	ND		1.0	0.76	ug/L			03/04/19 14:49	1
Bromomethane	ND		1.0	0.42	ug/L			03/04/19 14:49	1
Carbon disulfide	ND		1.0	0.28	ug/L			03/04/19 14:49	1
Carbon tetrachloride	ND		1.0	0.26	ug/L			03/04/19 14:49	1
Chlorobenzene	ND		1.0	0.14	ug/L			03/04/19 14:49	1
Chlorodibromomethane	ND		1.0	0.39	ug/L			03/04/19 14:49	1
Chloroethane	ND		1.0	0.83	ug/L			03/04/19 14:49	1
Chloroform	ND		1.0	0.13	ug/L			03/04/19 14:49	1
Chloromethane	ND		1.0	0.20	ug/L			03/04/19 14:49	1
cis-1,2-Dichloroethene	ND		1.0	0.16	ug/L			03/04/19 14:49	1
cis-1,3-Dichloropropene	ND		1.0	0.61	ug/L			03/04/19 14:49	1
Dibromomethane	ND		1.0	0.090	ug/L			03/04/19 14:49	1
Chlorobromomethane	ND		1.0	0.14	ug/L			03/04/19 14:49	1
Dichlorobromomethane	ND		1.0	0.17	ug/L			03/04/19 14:49	1
Ethylbenzene	ND		1.0	0.11	ug/L			03/04/19 14:49	1
Iodomethane	ND	*	1.0	0.23	ug/L			03/04/19 14:49	1
Methyl tert-butyl ether	ND		1.0	0.070	ug/L			03/04/19 14:49	1
Methylene Chloride	ND		5.0	2.6	ug/L			03/04/19 14:49	1
Styrene	ND		1.0	0.10	ug/L			03/04/19 14:49	1
Tetrachloroethene	ND		1.0	0.15	ug/L			03/04/19 14:49	1
Toluene	ND		1.0	0.14	ug/L			03/04/19 14:49	1
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			03/04/19 14:49	1
trans-1,3-Dichloropropene	ND		1.0	0.67	ug/L			03/04/19 14:49	1
trans-1,4-Dichloro-2-butene	ND		2.5	1.3	ug/L			03/04/19 14:49	1
Trichloroethene	ND		1.0	0.10	ug/L			03/04/19 14:49	1
Trichlorofluoromethane	ND		1.0	0.45	ug/L			03/04/19 14:49	1
Vinyl acetate	ND		2.0	0.19	ug/L			03/04/19 14:49	1
Vinyl chloride	ND		1.0	0.20	ug/L			03/04/19 14:49	1
Ethylene Dibromide	ND		1.0	0.12	ug/L			03/04/19 14:49	1

Client Sample ID: MW-1
Date Collected: 02/25/19 12:05
Date Received: 02/27/19 10:30

Lab Sample ID: 240-108605-1
Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*98*		*70 - 123*		*03/04/19 14:49*	*1*
Dibromofluoromethane (Surr)	*109*		*75 - 128*		*03/04/19 14:49*	*1*
4-Bromofluorobenzene (Surr)	*104*		*59 - 120*		*03/04/19 14:49*	*1*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 121*		*03/04/19 14:49*	*1*

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.053	ug/L		02/28/19 14:00	03/01/19 15:54	1
Arsenic	ND		5.0	0.75	ug/L		02/28/19 14:00	03/01/19 15:54	1
Barium	**74**		5.0	2.2	ug/L		02/28/19 14:00	03/01/19 15:54	1
Beryllium	ND		1.0	0.31	ug/L		02/28/19 14:00	03/01/19 15:54	1
Calcium	**13000**		1000	580	ug/L		02/28/19 14:00	03/01/19 15:54	1
Cadmium	ND		1.0	0.21	ug/L		02/28/19 14:00	03/01/19 15:54	1
Cobalt	**0.77**	**J**	1.0	0.19	ug/L		02/28/19 14:00	03/01/19 15:54	1
Chromium	**2.0**		2.0	0.98	ug/L		02/28/19 14:00	03/01/19 15:54	1
Copper	ND		2.0	1.7	ug/L		02/28/19 14:00	03/01/19 15:54	1
Iron	**170**		100	47	ug/L		02/28/19 14:00	03/01/19 15:54	1
Potassium	**3600**		1000	220	ug/L		02/28/19 14:00	03/01/19 15:54	1
Magnesium	**5300**		1000	200	ug/L		02/28/19 14:00	03/01/19 15:54	1
Manganese	**18**		5.0	2.1	ug/L		02/28/19 14:00	03/01/19 15:54	1
Sodium	**11000**		1000	330	ug/L		02/28/19 14:00	03/01/19 15:54	1
Nickel	**4.9**		2.0	1.5	ug/L		02/28/19 14:00	03/01/19 15:54	1
Lead	ND		1.0	0.45	ug/L		02/28/19 14:00	03/01/19 15:54	1
Selenium	ND		5.0	0.89	ug/L		02/28/19 14:00	03/01/19 15:54	1
Vanadium	ND		5.0	0.82	ug/L		02/28/19 14:00	03/01/19 15:54	1
Zinc	**22**		20	15	ug/L		02/28/19 14:00	03/01/19 15:54	1
Antimony	ND		2.0	0.57	ug/L		02/28/19 14:00	03/01/19 15:54	1
Thallium	ND		1.0	0.20	ug/L		02/28/19 14:00	03/01/19 15:54	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		02/28/19 12:00	02/28/19 17:17	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Turbidity	**1.1**	**H**	0.50	0.16	NTU			02/27/19 16:36	1
Alkalinity	ND		5.0	2.6	mg/L			03/01/19 19:36	1
Hardness as calcium carbonate	**66**		5.0	2.4	mg/L			03/06/19 11:15	1
Specific Conductance	**200**		1.0	0.61	umhos/cm			03/05/19 17:07	1
Resistivity	**5000**	**^**	1.0	0.61	ohm cm			03/05/19 17:07	1
Total Dissolved Solids	**120**		10	7.8	mg/L			03/01/19 14:05	1
Chloride	**14**		1.0	0.28	mg/L			02/27/19 21:52	1
Nitrate as N	**17**	**E H**	0.10	0.014	mg/L			02/27/19 21:52	1
Sulfate	ND		1.0	0.35	mg/L			02/27/19 21:52	1
Ammonia	ND		0.20	0.093	mg/L			03/05/19 06:54	1
Chemical Oxygen Demand	ND		10	4.1	mg/L			02/28/19 11:59	1
pH	**5.2**		0.1	0.1	SU			02/27/19 14:45	1

General Chemistry - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	**17**	**H**	1.0	0.14	mg/L			03/01/19 06:36	10

Client: Earth Data Inc
Project/Site: Dulin Landfill

TestAmerica Job ID: 240-108605-1

Client Sample ID: TRIP BLANK
Date Collected: 02/25/19 00:00
Date Received: 02/27/19 10:30

Lab Sample ID: 240-108605-2
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		1.0	0.14	ug/L			03/04/19 15:14	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			03/04/19 15:14	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.13	ug/L			03/04/19 15:14	1
1,1,2-Trichloroethane	ND		1.0	0.090	ug/L			03/04/19 15:14	1
1,1-Dichloroethane	ND		1.0	0.17	ug/L			03/04/19 15:14	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			03/04/19 15:14	1
1,2,3-Trichloropropane	ND		1.0	0.24	ug/L			03/04/19 15:14	1
1,2-Dibromo-3-Chloropropane	ND		2.0	0.91	ug/L			03/04/19 15:14	1
1,2-Dichlorobenzene	ND		1.0	0.15	ug/L			03/04/19 15:14	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			03/04/19 15:14	1
1,2-Dichloropropane	ND		1.0	0.15	ug/L			03/04/19 15:14	1
1,4-Dichlorobenzene	ND		1.0	0.16	ug/L			03/04/19 15:14	1
2-Butanone (MEK)	ND		10	1.2	ug/L			03/04/19 15:14	1
2-Hexanone	ND		10	0.54	ug/L			03/04/19 15:14	1
4-Methyl-2-pentanone (MIBK)	ND		10	0.42	ug/L			03/04/19 15:14	1
Acetone	ND		10	5.4	ug/L			03/04/19 15:14	1
Acrylonitrile	ND		20	1.1	ug/L			03/04/19 15:14	1
Benzene	ND		1.0	0.13	ug/L			03/04/19 15:14	1
Bromoform	ND		1.0	0.76	ug/L			03/04/19 15:14	1
Bromomethane	ND		1.0	0.42	ug/L			03/04/19 15:14	1
Carbon disulfide	ND		1.0	0.28	ug/L			03/04/19 15:14	1
Carbon tetrachloride	ND		1.0	0.26	ug/L			03/04/19 15:14	1
Chlorobenzene	ND		1.0	0.14	ug/L			03/04/19 15:14	1
Chlorodibromomethane	ND		1.0	0.39	ug/L			03/04/19 15:14	1
Chloroethane	ND		1.0	0.83	ug/L			03/04/19 15:14	1
Chloroform	ND		1.0	0.13	ug/L			03/04/19 15:14	1
Chloromethane	ND		1.0	0.20	ug/L			03/04/19 15:14	1
cis-1,2-Dichloroethene	ND		1.0	0.16	ug/L			03/04/19 15:14	1
cis-1,3-Dichloropropene	ND		1.0	0.61	ug/L			03/04/19 15:14	1
Dibromomethane	ND		1.0	0.090	ug/L			03/04/19 15:14	1
Chlorobromomethane	ND		1.0	0.14	ug/L			03/04/19 15:14	1
Dichlorobromomethane	ND		1.0	0.17	ug/L			03/04/19 15:14	1
Ethylbenzene	ND		1.0	0.11	ug/L			03/04/19 15:14	1
Iodomethane	ND	*	1.0	0.23	ug/L			03/04/19 15:14	1
Methyl tert-butyl ether	ND		1.0	0.070	ug/L			03/04/19 15:14	1
Methylene Chloride	ND		5.0	2.6	ug/L			03/04/19 15:14	1
Styrene	ND		1.0	0.10	ug/L			03/04/19 15:14	1
Tetrachloroethene	ND		1.0	0.15	ug/L			03/04/19 15:14	1
Toluene	ND		1.0	0.14	ug/L			03/04/19 15:14	1
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			03/04/19 15:14	1
trans-1,3-Dichloropropene	ND		1.0	0.67	ug/L			03/04/19 15:14	1
trans-1,4-Dichloro-2-butene	ND		2.5	1.3	ug/L			03/04/19 15:14	1
Trichloroethene	ND		1.0	0.10	ug/L			03/04/19 15:14	1
Trichlorofluoromethane	ND		1.0	0.45	ug/L			03/04/19 15:14	1
Vinyl acetate	ND		2.0	0.19	ug/L			03/04/19 15:14	1
Vinyl chloride	ND		1.0	0.20	ug/L			03/04/19 15:14	1
Ethylene Dibromide	ND		1.0	0.12	ug/L			03/04/19 15:14	1

Client Sample Results

Client: Earth Data Inc
Project/Site: Dulin Landfill

TestAmerica Job ID: 240-108605-1

Client Sample ID: TRIP BLANK
Date Collected: 02/25/19 00:00
Date Received: 02/27/19 10:30

Lab Sample ID: 240-108605-2
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		70 - 123		03/04/19 15:14	1
Dibromofluoromethane (Surr)	108		75 - 128		03/04/19 15:14	1
4-Bromofluorobenzene (Surr)	103		59 - 120		03/04/19 15:14	1
1,2-Dichloroethane-d4 (Surr)	105		70 - 121		03/04/19 15:14	1

Surrogate Summary

Client: Earth Data Inc
Project/Site: Dulin Landfill

TestAmerica Job ID: 240-108605-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		TOL	DBFM	BFB	DCA
Lab Sample ID	Client Sample ID	(70-123)	(75-128)	(59-120)	(70-121)
240-108605-1	MW-1	98	109	104	105
240-108605-2	TRIP BLANK	97	108	103	105
LCS 240-370137/5	Lab Control Sample	100	107	108	103
MB 240-370137/8	Method Blank	99	106	107	107

Surrogate Legend

TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 240-370137/8
Matrix: Water
Analysis Batch: 370137

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		1.0	0.14	ug/L			03/04/19 14:12	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			03/04/19 14:12	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.13	ug/L			03/04/19 14:12	1
1,1,2-Trichloroethane	ND		1.0	0.090	ug/L			03/04/19 14:12	1
1,1-Dichloroethane	ND		1.0	0.17	ug/L			03/04/19 14:12	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			03/04/19 14:12	1
1,2,3-Trichloropropane	ND		1.0	0.24	ug/L			03/04/19 14:12	1
1,2-Dibromo-3-Chloropropane	ND		2.0	0.91	ug/L			03/04/19 14:12	1
1,2-Dichlorobenzene	ND		1.0	0.15	ug/L			03/04/19 14:12	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			03/04/19 14:12	1
1,2-Dichloropropane	ND		1.0	0.15	ug/L			03/04/19 14:12	1
1,4-Dichlorobenzene	ND		1.0	0.16	ug/L			03/04/19 14:12	1
2-Butanone (MEK)	ND		10	1.2	ug/L			03/04/19 14:12	1
2-Hexanone	ND		10	0.54	ug/L			03/04/19 14:12	1
4-Methyl-2-pentanone (MIBK)	ND		10	0.42	ug/L			03/04/19 14:12	1
Acetone	ND		10	5.4	ug/L			03/04/19 14:12	1
Acrylonitrile	ND		20	1.1	ug/L			03/04/19 14:12	1
Benzene	ND		1.0	0.13	ug/L			03/04/19 14:12	1
Bromoform	ND		1.0	0.76	ug/L			03/04/19 14:12	1
Bromomethane	ND		1.0	0.42	ug/L			03/04/19 14:12	1
Carbon disulfide	ND		1.0	0.28	ug/L			03/04/19 14:12	1
Carbon tetrachloride	ND		1.0	0.26	ug/L			03/04/19 14:12	1
Chlorobenzene	ND		1.0	0.14	ug/L			03/04/19 14:12	1
Chlorodibromomethane	ND		1.0	0.39	ug/L			03/04/19 14:12	1
Chloroethane	ND		1.0	0.83	ug/L			03/04/19 14:12	1
Chloroform	ND		1.0	0.13	ug/L			03/04/19 14:12	1
Chloromethane	ND		1.0	0.20	ug/L			03/04/19 14:12	1
cis-1,2-Dichloroethene	ND		1.0	0.16	ug/L			03/04/19 14:12	1
cis-1,3-Dichloropropene	ND		1.0	0.61	ug/L			03/04/19 14:12	1
Dibromomethane	ND		1.0	0.090	ug/L			03/04/19 14:12	1
Chlorobromomethane	ND		1.0	0.14	ug/L			03/04/19 14:12	1
Dichlorobromomethane	ND		1.0	0.17	ug/L			03/04/19 14:12	1
Ethylbenzene	ND		1.0	0.11	ug/L			03/04/19 14:12	1
Iodomethane	ND		1.0	0.23	ug/L			03/04/19 14:12	1
Methyl tert-butyl ether	ND		1.0	0.070	ug/L			03/04/19 14:12	1
Methylene Chloride	ND		5.0	2.6	ug/L			03/04/19 14:12	1
Styrene	ND		1.0	0.10	ug/L			03/04/19 14:12	1
Tetrachloroethene	ND		1.0	0.15	ug/L			03/04/19 14:12	1
Toluene	ND		1.0	0.14	ug/L			03/04/19 14:12	1
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			03/04/19 14:12	1
trans-1,3-Dichloropropene	ND		1.0	0.67	ug/L			03/04/19 14:12	1
trans-1,4-Dichloro-2-butene	ND		2.5	1.3	ug/L			03/04/19 14:12	1
Trichloroethene	ND		1.0	0.10	ug/L			03/04/19 14:12	1
Trichlorofluoromethane	ND		1.0	0.45	ug/L			03/04/19 14:12	1
Vinyl acetate	ND		2.0	0.19	ug/L			03/04/19 14:12	1
Vinyl chloride	ND		1.0	0.20	ug/L			03/04/19 14:12	1
Ethylene Dibromide	ND		1.0	0.12	ug/L			03/04/19 14:12	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 240-370137/8
Matrix: Water
Analysis Batch: 370137

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		70 - 123		03/04/19 14:12	1
Dibromofluoromethane (Surr)	106		75 - 128		03/04/19 14:12	1
4-Bromofluorobenzene (Surr)	107		59 - 120		03/04/19 14:12	1
1,2-Dichloroethane-d4 (Surr)	107		70 - 121		03/04/19 14:12	1

Lab Sample ID: LCS 240-370137/5
Matrix: Water
Analysis Batch: 370137

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	20.0	21.0		ug/L		105	80 - 124
1,1,1-Trichloroethane	20.0	21.2		ug/L		106	69 - 134
1,1,2,2-Tetrachloroethane	20.0	20.2		ug/L		101	65 - 139
1,1,2-Trichloroethane	20.0	20.5		ug/L		103	78 - 133
1,1-Dichloroethane	20.0	21.2		ug/L		106	75 - 133
1,1-Dichloroethene	20.0	22.5		ug/L		112	65 - 139
1,2,3-Trichloropropane	20.0	20.0		ug/L		100	66 - 139
1,2-Dibromo-3-Chloropropane	20.0	19.3		ug/L		96	46 - 132
1,2-Dichlorobenzene	20.0	19.3		ug/L		96	78 - 120
1,2-Dichloroethane	20.0	20.0		ug/L		100	71 - 135
1,2-Dichloropropane	20.0	22.0		ug/L		110	78 - 133
1,4-Dichlorobenzene	20.0	19.1		ug/L		95	78 - 120
2-Butanone (MEK)	40.0	43.4		ug/L		108	39 - 163
2-Hexanone	40.0	40.0		ug/L		100	43 - 148
4-Methyl-2-pentanone (MIBK)	40.0	42.8		ug/L		107	49 - 143
Acetone	40.0	39.0		ug/L		98	21 - 162
Acrylonitrile	200	225		ug/L		112	54 - 152
Benzene	20.0	21.5		ug/L		108	80 - 123
Bromoform	20.0	21.6		ug/L		108	49 - 141
Bromomethane	20.0	26.4		ug/L		132	41 - 175
Carbon disulfide	20.0	22.5		ug/L		112	60 - 138
Carbon tetrachloride	20.0	22.1		ug/L		110	63 - 140
Chlorobenzene	20.0	20.3		ug/L		101	80 - 121
Chlorodibromomethane	20.0	21.2		ug/L		106	70 - 132
Chloroethane	20.0	19.4		ug/L		97	33 - 173
Chloroform	20.0	21.4		ug/L		107	79 - 127
Chloromethane	20.0	18.2		ug/L		91	54 - 143
cis-1,2-Dichloroethene	20.0	21.1		ug/L		106	76 - 128
cis-1,3-Dichloropropene	20.0	22.5		ug/L		112	64 - 132
Dibromomethane	20.0	20.9		ug/L		105	74 - 124
Chlorobromomethane	20.0	21.9		ug/L		109	74 - 130
Dichlorobromomethane	20.0	21.0		ug/L		105	77 - 125
Ethylbenzene	20.0	20.3		ug/L		102	80 - 120
Iodomethane	20.0	44.1	E *	ug/L		221	59 - 147
Methyl tert-butyl ether	20.0	21.2		ug/L		106	51 - 133
Methylene Chloride	20.0	21.1		ug/L		105	70 - 134
Styrene	20.0	19.7		ug/L		99	79 - 120
Tetrachloroethene	20.0	21.3		ug/L		107	74 - 130

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 240-370137/5
Matrix: Water
Analysis Batch: 370137

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Toluene	20.0	20.4		ug/L		102	78 - 129
trans-1,2-Dichloroethene	20.0	22.3		ug/L		111	78 - 133
trans-1,3-Dichloropropene	20.0	20.3		ug/L		101	55 - 128
trans-1,4-Dichloro-2-butene	20.0	19.0		ug/L		95	16 - 181
Trichloroethene	20.0	21.6		ug/L		108	76 - 125
Trichlorofluoromethane	20.0	20.2		ug/L		101	51 - 164
Vinyl acetate	20.0	23.4		ug/L		117	45 - 151
Vinyl chloride	20.0	18.7		ug/L		93	58 - 143
Ethylene Dibromide	20.0	20.0		ug/L		100	77 - 123

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*70 - 123*
Dibromofluoromethane (Surr)	*107*		*75 - 128*
4-Bromofluorobenzene (Surr)	*108*		*59 - 120*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 121*

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-369756/1-A
Matrix: Water
Analysis Batch: 369965

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 369756

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.053	ug/L		02/28/19 14:00	03/01/19 15:17	1
Arsenic	ND		5.0	0.75	ug/L		02/28/19 14:00	03/01/19 15:17	1
Barium	ND		5.0	2.2	ug/L		02/28/19 14:00	03/01/19 15:17	1
Beryllium	ND		1.0	0.31	ug/L		02/28/19 14:00	03/01/19 15:17	1
Calcium	ND		1000	580	ug/L		02/28/19 14:00	03/01/19 15:17	1
Cadmium	ND		1.0	0.21	ug/L		02/28/19 14:00	03/01/19 15:17	1
Cobalt	ND		1.0	0.19	ug/L		02/28/19 14:00	03/01/19 15:17	1
Chromium	ND		2.0	0.98	ug/L		02/28/19 14:00	03/01/19 15:17	1
Copper	ND		2.0	1.7	ug/L		02/28/19 14:00	03/01/19 15:17	1
Iron	ND		100	47	ug/L		02/28/19 14:00	03/01/19 15:17	1
Potassium	ND		1000	220	ug/L		02/28/19 14:00	03/01/19 15:17	1
Magnesium	ND		1000	200	ug/L		02/28/19 14:00	03/01/19 15:17	1
Manganese	ND		5.0	2.1	ug/L		02/28/19 14:00	03/01/19 15:17	1
Sodium	ND		1000	330	ug/L		02/28/19 14:00	03/01/19 15:17	1
Nickel	ND		2.0	1.5	ug/L		02/28/19 14:00	03/01/19 15:17	1
Lead	ND		1.0	0.45	ug/L		02/28/19 14:00	03/01/19 15:17	1
Selenium	ND		5.0	0.89	ug/L		02/28/19 14:00	03/01/19 15:17	1
Vanadium	ND		5.0	0.82	ug/L		02/28/19 14:00	03/01/19 15:17	1
Zinc	ND		20	15	ug/L		02/28/19 14:00	03/01/19 15:17	1
Antimony	ND		2.0	0.57	ug/L		02/28/19 14:00	03/01/19 15:17	1
Thallium	ND		1.0	0.20	ug/L		02/28/19 14:00	03/01/19 15:17	1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 240-369756/3-A
Matrix: Water
Analysis Batch: 369965

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 369756

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	100	97.7		ug/L		98	80 - 120
Arsenic	1000	913		ug/L		91	80 - 120
Barium	1000	976		ug/L		98	80 - 120
Beryllium	1000	918		ug/L		92	80 - 120
Calcium	10000	10300		ug/L		103	80 - 120
Cadmium	1000	938		ug/L		94	80 - 120
Cobalt	1000	961		ug/L		96	80 - 120
Chromium	1000	964		ug/L		96	80 - 120
Copper	1000	952		ug/L		95	80 - 120
Iron	10000	9310		ug/L		93	80 - 120
Potassium	10000	9770		ug/L		98	80 - 120
Magnesium	10000	9510		ug/L		95	80 - 120
Manganese	1000	962		ug/L		96	80 - 120
Sodium	10000	9570		ug/L		96	80 - 120
Nickel	1000	974		ug/L		97	80 - 120
Lead	1000	995		ug/L		100	80 - 120
Selenium	1000	898		ug/L		90	80 - 120
Vanadium	1000	969		ug/L		97	80 - 120
Zinc	1000	935		ug/L		94	80 - 120
Antimony	100	94.9		ug/L		95	80 - 120
Thallium	250	244		ug/L		98	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-369776/1-A
Matrix: Water
Analysis Batch: 369906

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 369776

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		02/28/19 12:00	02/28/19 16:48	1

Lab Sample ID: LCS 240-369776/2-A
Matrix: Water
Analysis Batch: 369906

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 369776

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.78		ug/L		96	80 - 120

Method: 180.1 - Turbidity, Nephelometric

Lab Sample ID: MB 240-369661/3
Matrix: Water
Analysis Batch: 369661

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Turbidity	ND		0.50	0.16	NTU			02/27/19 16:28	1

Method: 180.1 - Turbidity, Nephelometric (Continued)

Lab Sample ID: HLCS 240-369661/6
Matrix: Water
Analysis Batch: 369661

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Turbidity	572	589		NTU		103	75 - 125

Lab Sample ID: LCS 240-369661/5
Matrix: Water
Analysis Batch: 369661

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Turbidity	52.2	55.0		NTU		105	75 - 125

Lab Sample ID: LLCS 240-369661/4
Matrix: Water
Analysis Batch: 369661

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Turbidity	5.97	6.29		NTU		105	75 - 125

Lab Sample ID: 240-108605-1 DU
Matrix: Water
Analysis Batch: 369661

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Turbidity	1.1	H	1.03		NTU		4	20

Method: 2320B-2011 - Alkalinity, Total

Lab Sample ID: MB 240-370102/4
Matrix: Water
Analysis Batch: 370102

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	ND		5.0	2.6	mg/L			03/01/19 18:28	1

Lab Sample ID: LCS 240-370102/3
Matrix: Water
Analysis Batch: 370102

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	271	260		mg/L		96	86 - 123

Lab Sample ID: 240-108605-1 DU
Matrix: Water
Analysis Batch: 370102

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	ND		ND		mg/L		NC	20

Method: 2340C-2011 - Hardness, Total

Lab Sample ID: MB 240-370536/1
Matrix: Water
Analysis Batch: 370536

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	ND		5.0	2.4	mg/L			03/06/19 11:00	1

Lab Sample ID: LCS 240-370536/2
Matrix: Water
Analysis Batch: 370536

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hardness as calcium carbonate	246	260		mg/L		106	90 - 110

Method: 2510B-2011 - Conductivity, Specific Conductance

Lab Sample ID: MB 240-370417/3
Matrix: Water
Analysis Batch: 370417

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	0.61	umhos/cm			03/05/19 16:49	1
Resistivity	4550000		1.0	0.61	ohm cm			03/05/19 16:49	1

Lab Sample ID: LCS 240-370417/4
Matrix: Water
Analysis Batch: 370417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	1410	1430		umhos/cm		101	87 - 116

Method: 2540 C-2011 - Total Dissolved Solids (Dried at 180 °C)

Lab Sample ID: MB 240-369979/1
Matrix: Water
Analysis Batch: 369979

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	7.8	mg/L			03/01/19 14:05	1

Lab Sample ID: LCS 240-369979/2
Matrix: Water
Analysis Batch: 369979

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	202	204		mg/L		101	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 240-369630/3
Matrix: Water
Analysis Batch: 369630

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.28	mg/L			02/27/19 15:39	1
Sulfate	ND		1.0	0.35	mg/L			02/27/19 15:39	1

Lab Sample ID: LCS 240-369630/4
Matrix: Water
Analysis Batch: 369630

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.2		mg/L		100	90 - 110
Sulfate	50.0	51.5		mg/L		103	90 - 110

Lab Sample ID: MB 240-369631/3
Matrix: Water
Analysis Batch: 369631

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.10	0.014	mg/L			02/27/19 15:39	1

Lab Sample ID: LCS 240-369631/4
Matrix: Water
Analysis Batch: 369631

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.50	2.60		mg/L		104	90 - 110

Lab Sample ID: MB 240-369959/14
Matrix: Water
Analysis Batch: 369959

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.28	mg/L			02/28/19 20:57	1
Sulfate	ND		1.0	0.35	mg/L			02/28/19 20:57	1

Lab Sample ID: LCS 240-369959/15
Matrix: Water
Analysis Batch: 369959

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.3		mg/L		101	90 - 110
Sulfate	50.0	51.6		mg/L		103	90 - 110

Lab Sample ID: MB 240-369960/14
Matrix: Water
Analysis Batch: 369960

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.10	0.014	mg/L			02/28/19 20:57	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 240-369960/15
Matrix: Water
Analysis Batch: 369960

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.50	2.60		mg/L		104	90 - 110

Method: 4500 NH3 D-2011 - Ammonia

Lab Sample ID: MB 240-370349/7
Matrix: Water
Analysis Batch: 370349

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.093	mg/L			03/05/19 06:33	1

Lab Sample ID: LCS 240-370349/8
Matrix: Water
Analysis Batch: 370349

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	18.0	16.9		mg/L		94	85 - 114

Method: 5220D-2011 - Chemical Oxygen Demand

Lab Sample ID: MB 240-369755/9
Matrix: Water
Analysis Batch: 369755

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	ND		10	4.1	mg/L			02/28/19 11:50	1

Lab Sample ID: LCS 240-369755/10
Matrix: Water
Analysis Batch: 369755

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chemical Oxygen Demand	68.4	68.9		mg/L		101	90 - 110

Method: 9040C - pH

Lab Sample ID: LCS 240-369596/2
Matrix: Water
Analysis Batch: 369596

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	8.46	8.5		SU		100	97 - 103

GC/MS VOA

Analysis Batch: 370137

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total/NA	Water	8260C	
240-108605-2	TRIP BLANK	Total/NA	Water	8260C	
MB 240-370137/8	Method Blank	Total/NA	Water	8260C	
LCS 240-370137/5	Lab Control Sample	Total/NA	Water	8260C	

Metals

Prep Batch: 369756

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total Recoverable	Water	3005A	
MB 240-369756/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-369756/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 369776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total/NA	Water	7470A	
MB 240-369776/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-369776/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 369906

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total/NA	Water	7470A	369776
MB 240-369776/1-A	Method Blank	Total/NA	Water	7470A	369776
LCS 240-369776/2-A	Lab Control Sample	Total/NA	Water	7470A	369776

Analysis Batch: 369965

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total Recoverable	Water	6020A	369756
MB 240-369756/1-A	Method Blank	Total Recoverable	Water	6020A	369756
LCS 240-369756/3-A	Lab Control Sample	Total Recoverable	Water	6020A	369756

General Chemistry

Analysis Batch: 369596

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total/NA	Water	9040C	
LCS 240-369596/2	Lab Control Sample	Total/NA	Water	9040C	

Analysis Batch: 369630

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total/NA	Water	300.0	
MB 240-369630/3	Method Blank	Total/NA	Water	300.0	
LCS 240-369630/4	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 369631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total/NA	Water	300.0	
MB 240-369631/3	Method Blank	Total/NA	Water	300.0	
LCS 240-369631/4	Lab Control Sample	Total/NA	Water	300.0	

General Chemistry (Continued)

Analysis Batch: 369661

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total/NA	Water	180.1	
MB 240-369661/3	Method Blank	Total/NA	Water	180.1	
HLCS 240-369661/6	Lab Control Sample	Total/NA	Water	180.1	
LCS 240-369661/5	Lab Control Sample	Total/NA	Water	180.1	
LLCS 240-369661/4	Lab Control Sample	Total/NA	Water	180.1	
240-108605-1 DU	MW-1	Total/NA	Water	180.1	

Analysis Batch: 369755

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total/NA	Water	5220D-2011	
MB 240-369755/9	Method Blank	Total/NA	Water	5220D-2011	
LCS 240-369755/10	Lab Control Sample	Total/NA	Water	5220D-2011	

Analysis Batch: 369959

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-369959/14	Method Blank	Total/NA	Water	300.0	
LCS 240-369959/15	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 369960

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1 - RA	MW-1	Total/NA	Water	300.0	
MB 240-369960/14	Method Blank	Total/NA	Water	300.0	
LCS 240-369960/15	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 369979

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total/NA	Water	2540 C-2011	
MB 240-369979/1	Method Blank	Total/NA	Water	2540 C-2011	
LCS 240-369979/2	Lab Control Sample	Total/NA	Water	2540 C-2011	

Analysis Batch: 370102

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total/NA	Water	2320B-2011	
MB 240-370102/4	Method Blank	Total/NA	Water	2320B-2011	
LCS 240-370102/3	Lab Control Sample	Total/NA	Water	2320B-2011	
240-108605-1 DU	MW-1	Total/NA	Water	2320B-2011	

Analysis Batch: 370349

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total/NA	Water	4500 NH3 D-2011	
MB 240-370349/7	Method Blank	Total/NA	Water	4500 NH3 D-2011	
LCS 240-370349/8	Lab Control Sample	Total/NA	Water	4500 NH3 D-2011	

Analysis Batch: 370417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total/NA	Water	2510B-2011	
MB 240-370417/3	Method Blank	Total/NA	Water	2510B-2011	
LCS 240-370417/4	Lab Control Sample	Total/NA	Water	2510B-2011	

General Chemistry (Continued)

Analysis Batch: 370536

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108605-1	MW-1	Total/NA	Water	2340C-2011	
MB 240-370536/1	Method Blank	Total/NA	Water	2340C-2011	
LCS 240-370536/2	Lab Control Sample	Total/NA	Water	2340C-2011	

Lab Chronicle

Client: Earth Data Inc
Project/Site: Dulin Landfill

TestAmerica Job ID: 240-108605-1

Client Sample ID: MW-1

Lab Sample ID: 240-108605-1

Date Collected: 02/25/19 12:05

Matrix: Water

Date Received: 02/27/19 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	370137	03/04/19 14:49	HMB	TAL CAN
Total Recoverable	Prep	3005A			369756	02/28/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1	369965	03/01/19 15:54	DSH	TAL CAN
Total/NA	Prep	7470A			369776	02/28/19 12:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1	369906	02/28/19 17:17	AJC	TAL CAN
Total/NA	Analysis	180.1		1	369661	02/27/19 16:36	MMM	TAL CAN
Total/NA	Analysis	2320B-2011		1	370102	03/01/19 19:36	JMB	TAL CAN
Total/NA	Analysis	2340C-2011		1	370536	03/06/19 11:15	JMB	TAL CAN
Total/NA	Analysis	2510B-2011		1	370417	03/05/19 17:07	JWW	TAL CAN
Total/NA	Analysis	2540 C-2011		1	369979	03/01/19 14:05	JMB	TAL CAN
Total/NA	Analysis	300.0		1	369630	02/27/19 21:52	ACR	TAL CAN
Total/NA	Analysis	300.0		1	369631	02/27/19 21:52	ACR	TAL CAN
Total/NA	Analysis	300.0	RA	10	369960	03/01/19 06:36	JWW	TAL CAN
Total/NA	Analysis	4500 NH3 D-2011		1	370349	03/05/19 06:54	JAS	TAL CAN
Total/NA	Analysis	5220D-2011		1	369755	02/28/19 11:59	TPH	TAL CAN
Total/NA	Analysis	9040C		1	369596	02/27/19 14:45	BLW	TAL CAN

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-108605-2

Date Collected: 02/25/19 00:00

Matrix: Water

Date Received: 02/27/19 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	370137	03/04/19 15:14	HMB	TAL CAN

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: Earth Data Inc
Project/Site: Dulin Landfill

TestAmerica Job ID: 240-108605-1

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-20
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	04-30-19 *
Kentucky (UST)	State Program	4	58	02-23-20
Kentucky (WW)	State Program	4	98016	12-31-19
Minnesota	NELAP	5	039-999-348	12-31-19 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19 *
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-20
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-20 *
West Virginia DEP	State Program	3	210	12-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone (330) 497-9396 Fax (330) 497-0772

3.2/C3.0

Chain of Custody Record

Baltimore #201

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler:	Lab PM: DelMonico, Michael	Carrier Tracking No(s):	COC No: 240-58116-24861.1
Client Contact: Jeff Chipman	Phone:	E-Mail: michael.delmonico@testamericainc.com		Page: Page 1
Company: Earth Data Inc				Job #:
Address: 131 Comet Drive	Due Date Requested:	Analysis Requested		Preservation Codes:
City: Centreville	TAT Requested (days):			
State, Zip: MD, 21617				
Phone: (410) 758-8160	PO #: 4697D			
Email: jchipman@earthdatainc.com	WO #:			
Project Name: Dolin Landfill	Project #: 24020914			
Site:	SSOW#:			

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK_175_UP - Dissolved Methane	2320B, 9040C	2340C - Total Hardness	6020A, 7470A	5220D, SM4500NH3_D	8260C - Project VOCs	180.1, 2510B, 2540C_Calcd, 300, 300.0_28D	8260C - Project VOCs - TB	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	D	D	S	A	N	A		
MW-1	2/25/19	12:05	G	Water			X	X	X	X	X	X	X	X		
Trip Blank	In Lab			Water												
				Water												
				Water												
				Water												
				Water												
				Water												
				Water												
				Water												
				Water												
				Water												

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	2/26/19 1624		[signature]	2/26/19 1624	
2	[signature]	2/26/19 1700	TA	[signature]	2-27-19 1030	TA
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 108605
Canton Facility

Client Earth Data Site Name _____ Cooler unpacked by: Ryan Crables

Cooler Received on 2-27-19 Opened on 2-27-19 1050

FedEx: 1st Grd (Exp) UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam (Plastic Bag) None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF **-0.2** °C) Observed Cooler Temp. 3.2 °C Corrected Cooler Temp. 3.0 °C
   IR GUN #36 (CF **+0.7**°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes (No)
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels be reconciled with the COC? (Yes) No
9. Were correct bottle(s) used for the test(s) indicated? (Yes) No
10. Sufficient quantity received to perform indicated analyses? (Yes) No
11. Are these work share samples? Yes (No)
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? (Yes) No NA pH Strip Lot# **HC861525**
13. Were VOAs on the COC? (Yes) No
14. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # B831701VB (Yes) No
16. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Mike D Date 2/27/19 by TB via Verbal (Voice Mail) Other

Concerning #17

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by: Ryan

No R5K vials rec'd.

18. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot #
MW-1	240-108605-E-1	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-1	240-108605-G-1	Plastic 500ml - with Sulfuric Acid	<2	_____	_____
MW-1	240-108605-H-1	Plastic 500ml - with Nitric Acid	<2	_____	_____

PHASE SEPARATION SCIENCE

6630 Baltimore National Pike
Baltimore, MD 21228
410-747-8770
800-932-9047
www.phaseonline.com

Certificate of Analysis

Project Name: Dulin Landfill
PSS Project No.: 19082703

September 13, 2019

J.P. Stokes
Earth Data, Inc
131 Comet Drive
Centreville, MD 21617

Reference: PSS Project No: **19082703**
Project Name: Dulin Landfill
Project Location: Chestertown, Maryland
Project ID.: 4697E

Dear J.P. Stokes:

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Project number(s) **19082703**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on October 1, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt, the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

PHASE SEPARATION SCIENCE

6630 Baltimore National Pike
Baltimore, MD 21228
410-747-8770
800-932-9047
www.phaseonline.com

Explanation of Qualifiers

Project Name: Dulin Landfill

PSS Project No.: 19082703

Project ID: 4697E

The following samples were received under chain of custody by Phase Separation Science (PSS) on 08/27/2019 at 08:45 am

PSS Sample ID	Sample ID	Matrix	Date/Time Collected
19082703-001	MW-1	GROUND WATER	08/26/19 13:00
19082703-002	MW-2	GROUND WATER	08/26/19 12:05
19082703-003	MW-3	GROUND WATER	08/26/19 11:55
19082703-004	MW-4	GROUND WATER	08/26/19 11:15
19082703-005	MW-5	GROUND WATER	08/26/19 10:35

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

PHASE SEPARATION SCIENCE

6630 Baltimore National Pike
Baltimore, MD 21228
410-747-8770
800-932-9047
www.phaseonline.com

Certificate of Analysis

Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-1 **Date/Time Sampled: 08/26/2019 13:00** **PSS Sample ID: 19082703-001**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Turbidity — Analytical Method: EPA 180.1

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Turbidity	**0.97**	NTU	0.50		1	0.31	08/27/19	08/27/19 15:07	1064

Total Metals (22 & Hardness) — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Antimony	ND	ug/L	5.0		1	0.72	08/28/19	08/28/19 17:54	1064
Arsenic	ND	ug/L	1.0		1	0.16	08/28/19	08/28/19 17:54	1064
Barium	**74.9**	ug/L	1.00		1	0.29	08/28/19	08/28/19 17:54	1064
Beryllium	ND	ug/L	1.0		1	0.25	08/28/19	08/28/19 17:54	1064
Cadmium	ND	ug/L	1.0		1	0.14	08/28/19	08/28/19 17:54	1064
Calcium	**15,900**	ug/L	2,000		20	720	08/28/19	08/29/19 17:41	1064
Chromium	**1.4**	ug/L	1.0		1	0.22	08/28/19	08/28/19 17:54	1064
Cobalt	**0.78**	ug/L	1.0	J	1	0.13	08/28/19	08/28/19 17:54	1064
Copper	ND	ug/L	1.0		1	0.8	08/28/19	08/28/19 17:54	1064
Iron	**23.4**	ug/L	100	J	1	21	08/28/19	08/28/19 17:54	1064
Lead	ND	ug/L	1.0		1	0.52	08/28/19	08/28/19 17:54	1064
Magnesium	**5,020**	ug/L	100		1	18	08/28/19	08/28/19 17:54	1064
Manganese	**17.1**	ug/L	1.00		1	0.4	08/28/19	08/28/19 17:54	1064
Mercury	ND	ug/L	0.20		1	0.034	08/28/19	08/28/19 17:54	1064
Nickel	**5.4**	ug/L	1.0		1	0.39	08/28/19	08/28/19 17:54	1064
Potassium	**3,180**	ug/L	100		1	37	08/28/19	08/28/19 17:54	1064
Selenium	ND	ug/L	1.0		1	0.21	08/28/19	08/28/19 17:54	1064
Silver	ND	ug/L	1.0		1	0.15	08/28/19	08/28/19 17:54	1064
Sodium	**9,850**	ug/L	2,000		20	1,440	08/28/19	08/29/19 17:41	1064
Thallium	ND	ug/L	1.0		1	0.25	08/28/19	08/28/19 17:54	1064
Vanadium	ND	ug/L	1.0		1	0.13	08/28/19	08/28/19 17:54	1064
Zinc	**30.3**	ug/L	20.0		1	9.9	08/28/19	08/28/19 17:54	1064
Hardness (Ca & Mg)	**60**	mg/L	5.4		1	1.9	08/28/19	08/28/19 17:54	1064

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-1 **Date/Time Sampled: 08/26/2019 13:00** **PSS Sample ID: 19082703-001**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Chloride, Sulfate & Nitrate — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chloride	**15**	mg/L	5.0		1	0.5	08/27/19	08/27/19 13:27	1053
Nitrate (as N)	**18**	mg/L	0.10		1	0.044	08/27/19	08/27/19 13:27	1053
Sulfate	ND	mg/L	5.0		1	1.6	08/27/19	08/27/19 13:27	1053

Alkalinity Low Level — Analytical Method: SM 2320B -11

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Alkalinity, Total (as CaCO3)	**1.1**	mg/L	1.0		1	1	08/30/19	08/30/19 14:39	1053

Conductivity — Analytical Method: SM 2510B -2011

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Conductivity	**190**	us/cm	10		1	1	08/27/19	08/27/19 14:41	1061

Total Dissolved Solids (TDS) — Analytical Method: SM 2540C -2011 — Preparation Method: SM2540C

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Total Dissolved Solids	**130**	mg/L	10		1	10	08/29/19	08/30/19 13:00	1061

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-1 **Date/Time Sampled: 08/26/2019 13:00** **PSS Sample ID: 19082703-001**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

Qualifier(s): See Sample Receipt section on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
pH	**5.6**	S.U.			1		08/27/19	08/27/19 14:56	1061

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	0.1	08/28/19	08/28/19 13:02	1053

Chemical Oxygen Demand — Analytical Method: SM 5220D -2011

Qualifier(s): See Batch 167133 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**6.0**	mg/L	5.0		1	5	08/27/19	08/27/19 14:23	1053

EDB & DBCP — Analytical Method: SW-846 8011

Qualifier(s): See Sample Receipt section on Case Narrative. See Batch 167596 on Case Narrative.

	Result	Units	RL	Flag	MDL	Prepared	Analyzed	Analyst
1,2-Dibromoethane	ND	ug/L	0.040		0.031	08/30/19	09/03/19 23:24	4003
1,2-Dibromo-3-Chloropropane	ND	ug/L	0.040		0.014	08/30/19	09/03/19 23:24	4003

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-1 **Date/Time Sampled: 08/26/2019 13:00** **PSS Sample ID: 19082703-001**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

Qualifier(s): See Batch 167153 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Vinyl chloride	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Bromomethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Chloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Acetone	ND	ug/L	10		1	5	08/27/19	08/27/19 18:58	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 18:58	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Methylene chloride	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Vinyl acetate	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
2-Butanone (MEK)	ND	ug/L	10		1	5	08/27/19	08/27/19 18:58	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Bromochloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Chloroform	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Carbon tetrachloride	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Benzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Dibromomethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Acrylonitrile	ND	ug/L	10		1	5	08/27/19	08/27/19 18:58	1011
Trichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Carbon Disulfide	ND	ug/L	10		1	5	08/27/19	08/27/19 18:58	1011
Bromodichloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 18:58	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Toluene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
2-Hexanone (MBK)	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 18:58	1011
Dibromochloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Bromoform	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 18:58	1011

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-1 **Date/Time Sampled: 08/26/2019 13:00** **PSS Sample ID: 19082703-001**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

Qualifier(s): See Batch 167153 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
trans-1,4-dichloro-2-butene	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 18:58	1011
Tetrachloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Chlorobenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Ethylbenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
m&p-Xylene	ND	ug/L	2.0		1	1	08/27/19	08/27/19 18:58	1011
Styrene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
o-Xylene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
1,2,3-Trichloropropane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 18:58	1011
Iodomethane	ND	ug/L	20		1	10	08/27/19	08/27/19 18:58	1011

Surrogate(s)	*Recovery*		*Limits*					
4-Bromofluorobenzene	*110*	*%*	*87-109*	*	*1*	*08/27/19*	*08/27/19 18:58*	*1011*
Dibromofluoromethane	*109*	*%*	*93-111*		*1*	*08/27/19*	*08/27/19 18:58*	*1011*
Toluene-D8	*102*	*%*	*91-109*		*1*	*08/27/19*	*08/27/19 18:58*	*1011*

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-2 **Date/Time Sampled: 08/26/2019 12:05** **PSS Sample ID: 19082703-002**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Turbidity — Analytical Method: EPA 180.1

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Turbidity	**0.57**	NTU	0.50		1	0.31	08/27/19	08/27/19 15:07	1064

Total Metals (22 & Hardness) — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Antimony	ND	ug/L	5.0		1	0.72	08/28/19	08/28/19 18:10	1064
Arsenic	ND	ug/L	1.0		1	0.16	08/28/19	08/28/19 18:10	1064
Barium	**26.4**	ug/L	1.00		1	0.29	08/28/19	08/28/19 18:10	1064
Beryllium	ND	ug/L	1.0		1	0.25	08/28/19	08/28/19 18:10	1064
Cadmium	ND	ug/L	1.0		1	0.14	08/28/19	08/28/19 18:10	1064
Calcium	**10,700**	ug/L	2,000		20	720	08/28/19	08/29/19 17:58	1064
Chromium	**1.1**	ug/L	1.0		1	0.22	08/28/19	08/28/19 18:10	1064
Cobalt	**0.76**	ug/L	1.0	J	1	0.13	08/28/19	08/28/19 18:10	1064
Copper	**4.4**	ug/L	1.0		1	0.8	08/28/19	08/28/19 18:10	1064
Iron	ND	ug/L	100		1	21	08/28/19	08/28/19 18:10	1064
Lead	ND	ug/L	1.0		1	0.52	08/28/19	08/28/19 18:10	1064
Magnesium	**3,290**	ug/L	100		1	18	08/28/19	08/28/19 18:10	1064
Manganese	**9.3**	ug/L	1.0		1	0.4	08/28/19	08/28/19 18:10	1064
Mercury	ND	ug/L	0.20		1	0.034	08/28/19	08/28/19 18:10	1064
Nickel	**2.8**	ug/L	1.0		1	0.39	08/28/19	08/28/19 18:10	1064
Potassium	**2,010**	ug/L	100		1	37	08/28/19	08/28/19 18:10	1064
Selenium	ND	ug/L	1.0		1	0.21	08/28/19	08/28/19 18:10	1064
Silver	ND	ug/L	1.0		1	0.15	08/28/19	08/28/19 18:10	1064
Sodium	**4,270**	ug/L	100		1	72	08/28/19	08/28/19 18:10	1064
Thallium	ND	ug/L	1.0		1	0.25	08/28/19	08/28/19 18:10	1064
Vanadium	ND	ug/L	1.0		1	0.13	08/28/19	08/28/19 18:10	1064
Zinc	**22.7**	ug/L	20.0		1	9.9	08/28/19	08/28/19 18:10	1064
Hardness (Ca & Mg)	**40**	mg/L	5.4		1	1.9	08/28/19	08/28/19 18:10	1064

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-2 **Date/Time Sampled: 08/26/2019 12:05** **PSS Sample ID: 19082703-002**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Chloride, Sulfate & Nitrate — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chloride	**11**	mg/L	5.0		1	0.5	08/27/19	08/27/19 13:52	1053
Nitrate (as N)	**11**	mg/L	0.10		1	0.044	08/27/19	08/27/19 13:52	1053
Sulfate	ND	mg/L	5.0		1	1.6	08/27/19	08/27/19 13:52	1053

Alkalinity Low Level — Analytical Method: SM 2320B -11

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Alkalinity, Total (as CaCO3)	**1.1**	mg/L	1.0		1	1	08/30/19	08/30/19 14:39	1053

Conductivity — Analytical Method: SM 2510B -2011

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Conductivity	**120**	us/cm	10		1	1	08/27/19	08/27/19 14:41	1061

Total Dissolved Solids (TDS) — Analytical Method: SM 2540C -2011 — Preparation Method: SM2540C

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Total Dissolved Solids	**110**	mg/L	10		1	10	08/29/19	08/30/19 13:00	1061

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-2 **Date/Time Sampled: 08/26/2019 12:05** **PSS Sample ID: 19082703-002**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

Qualifier(s): See Sample Receipt section on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
pH	**5.7**	S.U.			1		08/27/19	08/27/19 14:56	1061

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	0.1	08/28/19	08/28/19 13:14	1053

Chemical Oxygen Demand — Analytical Method: SM 5220D -2011

Qualifier(s): See Batch 167133 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	mg/L	5.0		1	5	08/27/19	08/27/19 14:23	1053

EDB & DBCP — Analytical Method: SW-846 8011

Qualifier(s): See Sample Receipt section on Case Narrative. See Batch 167596 on Case Narrative.

	Result	Units	RL	Flag	MDL	Prepared	Analyzed	Analyst
1,2-Dibromoethane	ND	ug/L	0.040		0.031	08/30/19	09/03/19 23:37	4003
1,2-Dibromo-3-Chloropropane	ND	ug/L	0.040		0.014	08/30/19	09/03/19 23:37	4003

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-2 **Date/Time Sampled: 08/26/2019 12:05** **PSS Sample ID: 19082703-002**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

Qualifier(s): See Batch 167153 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Vinyl chloride	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Bromomethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Chloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Acetone	ND	ug/L	10		1	5	08/27/19	08/27/19 19:21	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 19:21	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Methylene chloride	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Vinyl acetate	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
2-Butanone (MEK)	ND	ug/L	10		1	5	08/27/19	08/27/19 19:21	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Bromochloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Chloroform	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Carbon tetrachloride	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Benzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Dibromomethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Acrylonitrile	ND	ug/L	10		1	5	08/27/19	08/27/19 19:21	1011
Trichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Carbon Disulfide	ND	ug/L	10		1	5	08/27/19	08/27/19 19:21	1011
Bromodichloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 19:21	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Toluene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
2-Hexanone (MBK)	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 19:21	1011
Dibromochloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Bromoform	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 19:21	1011

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-2 **Date/Time Sampled: 08/26/2019 12:05** **PSS Sample ID: 19082703-002**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

Qualifier(s): See Batch 167153 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
trans-1,4-dichloro-2-butene	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 19:21	1011
Tetrachloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Chlorobenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Ethylbenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
m&p-Xylene	ND	ug/L	2.0		1	1	08/27/19	08/27/19 19:21	1011
Styrene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
o-Xylene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
1,2,3-Trichloropropane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:21	1011
Iodomethane	ND	ug/L	20		1	10	08/27/19	08/27/19 19:21	1011

Surrogate(s)	*Recovery*		*Limits*					
4-Bromofluorobenzene	*113*	*%*	*87-109*	*	*1*	*08/27/19*	*08/27/19 19:21*	*1011*
Dibromofluoromethane	*108*	*%*	*93-111*		*1*	*08/27/19*	*08/27/19 19:21*	*1011*
Toluene-D8	*102*	*%*	*91-109*		*1*	*08/27/19*	*08/27/19 19:21*	*1011*

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-3 **Date/Time Sampled: 08/26/2019 11:55** **PSS Sample ID: 19082703-003**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Turbidity — Analytical Method: EPA 180.1

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Turbidity	**1.2**	NTU	0.50		1	0.31	08/27/19	08/27/19 15:07	1064

Total Metals (22 & Hardness) — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Antimony	ND	ug/L	5.0		1	0.72	08/28/19	08/28/19 18:16	1064
Arsenic	ND	ug/L	1.0		1	0.16	08/28/19	08/28/19 18:16	1064
Barium	**52.1**	ug/L	1.00		1	0.29	08/28/19	08/28/19 18:16	1064
Beryllium	ND	ug/L	1.0		1	0.25	08/28/19	08/28/19 18:16	1064
Cadmium	ND	ug/L	1.0		1	0.14	08/28/19	08/28/19 18:16	1064
Calcium	**10,200**	ug/L	2,000		20	720	08/28/19	08/29/19 18:04	1064
Chromium	**1.4**	ug/L	1.0		1	0.22	08/28/19	08/28/19 18:16	1064
Cobalt	**0.59**	ug/L	1.0	J	1	0.13	08/28/19	08/28/19 18:16	1064
Copper	ND	ug/L	1.0		1	0.8	08/28/19	08/28/19 18:16	1064
Iron	**35.4**	ug/L	100	J	1	21	08/28/19	08/28/19 18:16	1064
Lead	ND	ug/L	1.0		1	0.52	08/28/19	08/28/19 18:16	1064
Magnesium	**4,090**	ug/L	100		1	18	08/28/19	08/28/19 18:16	1064
Manganese	**23.0**	ug/L	1.00		1	0.4	08/28/19	08/28/19 18:16	1064
Mercury	ND	ug/L	0.20		1	0.034	08/28/19	08/28/19 18:16	1064
Nickel	**2.0**	ug/L	1.0		1	0.39	08/28/19	08/28/19 18:16	1064
Potassium	**2,000**	ug/L	100		1	37	08/28/19	08/28/19 18:16	1064
Selenium	ND	ug/L	1.0		1	0.21	08/28/19	08/28/19 18:16	1064
Silver	ND	ug/L	1.0		1	0.15	08/28/19	08/28/19 18:16	1064
Sodium	**4,020**	ug/L	100		1	72	08/28/19	08/28/19 18:16	1064
Thallium	ND	ug/L	1.0		1	0.25	08/28/19	08/28/19 18:16	1064
Vanadium	**0.31**	ug/L	1.0	J	1	0.13	08/28/19	08/28/19 18:16	1064
Zinc	**34.3**	ug/L	20.0		1	9.9	08/28/19	08/28/19 18:16	1064
Hardness (Ca & Mg)	**42**	mg/L	5.4		1	1.9	08/28/19	08/28/19 18:16	1064

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-3 **Date/Time Sampled: 08/26/2019 11:55** **PSS Sample ID: 19082703-003**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Chloride, Sulfate & Nitrate — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chloride	**14**	mg/L	5.0		1	0.5	08/27/19	08/27/19 14:17	1053
Nitrate (as N)	**5.2**	mg/L	0.10		1	0.044	08/27/19	08/27/19 14:17	1053
Sulfate	**12**	mg/L	5.0		1	1.6	08/27/19	08/27/19 14:17	1053

Alkalinity Low Level — Analytical Method: SM 2320B -11

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Alkalinity, Total (as CaCO3)	**2.5**	mg/L	1.0		1	1	08/30/19	08/30/19 14:39	1053

Conductivity — Analytical Method: SM 2510B -2011

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Conductivity	**130**	us/cm	10		1	1	08/27/19	08/27/19 14:41	1061

Total Dissolved Solids (TDS) — Analytical Method: SM 2540C -2011 — Preparation Method: SM2540C

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Total Dissolved Solids	**87**	mg/L	10		1	10	08/29/19	08/30/19 13:00	1061

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-3 **Date/Time Sampled: 08/26/2019 11:55** **PSS Sample ID: 19082703-003**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

Qualifier(s): See Sample Receipt section on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
pH	**5.4**	S.U.			1		08/27/19	08/27/19 14:56	1061

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	0.1	08/28/19	08/28/19 13:18	1053

Chemical Oxygen Demand — Analytical Method: SM 5220D -2011

Qualifier(s): See Batch 167133 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	mg/L	5.0		1	5	08/27/19	08/27/19 14:23	1053

EDB & DBCP — Analytical Method: SW-846 8011

Qualifier(s): See Sample Receipt section on Case Narrative. See Batch 167596 on Case Narrative.

	Result	Units	RL	Flag	MDL	Prepared	Analyzed	Analyst
1,2-Dibromoethane	ND	ug/L	0.040		0.031	08/30/19	09/04/19 00:14	4003
1,2-Dibromo-3-Chloropropane	ND	ug/L	0.040		0.014	08/30/19	09/04/19 00:14	4003

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-3 **Date/Time Sampled: 08/26/2019 11:55** **PSS Sample ID: 19082703-003**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

Qualifier(s): See Batch 167153 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Vinyl chloride	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Bromomethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Chloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Acetone	ND	ug/L	10		1	5	08/27/19	08/27/19 19:44	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 19:44	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Methylene chloride	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Vinyl acetate	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
2-Butanone (MEK)	ND	ug/L	10		1	5	08/27/19	08/27/19 19:44	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Bromochloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Chloroform	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Carbon tetrachloride	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Benzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Dibromomethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Acrylonitrile	ND	ug/L	10		1	5	08/27/19	08/27/19 19:44	1011
Trichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Carbon Disulfide	ND	ug/L	10		1	5	08/27/19	08/27/19 19:44	1011
Bromodichloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 19:44	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Toluene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
2-Hexanone (MBK)	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 19:44	1011
Dibromochloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Bromoform	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 19:44	1011

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-3 **Date/Time Sampled: 08/26/2019 11:55** **PSS Sample ID: 19082703-003**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

Qualifier(s): See Batch 167153 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
trans-1,4-dichloro-2-butene	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 19:44	1011
Tetrachloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Chlorobenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Ethylbenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
m&p-Xylene	ND	ug/L	2.0		1	1	08/27/19	08/27/19 19:44	1011
Styrene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
o-Xylene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
1,2,3-Trichloropropane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 19:44	1011
Iodomethane	ND	ug/L	20		1	10	08/27/19	08/27/19 19:44	1011

Surrogate(s)	*Recovery*		*Limits*					
4-Bromofluorobenzene	*113*	*%*	*87-109*	*	*1*	*08/27/19*	*08/27/19 19:44*	*1011*
Dibromofluoromethane	*106*	*%*	*93-111*		*1*	*08/27/19*	*08/27/19 19:44*	*1011*
Toluene-D8	*101*	*%*	*91-109*		*1*	*08/27/19*	*08/27/19 19:44*	*1011*

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-4 **Date/Time Sampled: 08/26/2019 11:15** **PSS Sample ID: 19082703-004**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Turbidity — Analytical Method: EPA 180.1

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Turbidity	**0.65**	NTU	0.50		1	0.31	08/27/19	08/27/19 15:07	1064

Total Metals (22 & Hardness) — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Antimony	ND	ug/L	5.0		1	0.72	08/28/19	08/28/19 18:21	1064
Arsenic	ND	ug/L	1.0		1	0.16	08/28/19	08/28/19 18:21	1064
Barium	**36.2**	ug/L	1.00		1	0.29	08/28/19	08/28/19 18:21	1064
Beryllium	**0.25**	ug/L	1.0	J	1	0.25	08/28/19	08/28/19 18:21	1064
Cadmium	ND	ug/L	1.0		1	0.14	08/28/19	08/28/19 18:21	1064
Calcium	**11,800**	ug/L	2,000		20	720	08/28/19	08/29/19 18:09	1064
Chromium	**0.82**	ug/L	1.0	J	1	0.22	08/28/19	08/28/19 18:21	1064
Cobalt	**2.4**	ug/L	1.0		1	0.13	08/28/19	08/28/19 18:21	1064
Copper	**3.4**	ug/L	1.0		1	0.8	08/28/19	08/28/19 18:21	1064
Iron	**46.4**	ug/L	100	J	1	21	08/28/19	08/28/19 18:21	1064
Lead	ND	ug/L	1.0		1	0.52	08/28/19	08/28/19 18:21	1064
Magnesium	**2,720**	ug/L	100		1	18	08/28/19	08/28/19 18:21	1064
Manganese	**137**	ug/L	1.00		1	0.4	08/28/19	08/28/19 18:21	1064
Mercury	ND	ug/L	0.20		1	0.034	08/28/19	08/28/19 18:21	1064
Nickel	**2.6**	ug/L	1.0		1	0.39	08/28/19	08/28/19 18:21	1064
Potassium	**1,910**	ug/L	100		1	37	08/28/19	08/28/19 18:21	1064
Selenium	ND	ug/L	1.0		1	0.21	08/28/19	08/28/19 18:21	1064
Silver	ND	ug/L	1.0		1	0.15	08/28/19	08/28/19 18:21	1064
Sodium	**3,260**	ug/L	100		1	72	08/28/19	08/28/19 18:21	1064
Thallium	ND	ug/L	1.0		1	0.25	08/28/19	08/28/19 18:21	1064
Vanadium	**0.14**	ug/L	1.0	J	1	0.13	08/28/19	08/28/19 18:21	1064
Zinc	**21.3**	ug/L	20.0		1	9.9	08/28/19	08/28/19 18:21	1064
Hardness (Ca & Mg)	**41**	mg/L	5.4		1	1.9	08/28/19	08/28/19 18:21	1064

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-4 **Date/Time Sampled: 08/26/2019 11:15** **PSS Sample ID: 19082703-004**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Chloride, Sulfate & Nitrate — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chloride	**14**	mg/L	5.0		1	0.5	08/27/19	08/27/19 14:41	1053
Nitrate (as N)	**7.1**	mg/L	0.10		1	0.044	08/27/19	08/27/19 14:41	1053
Sulfate	ND	mg/L	5.0		1	1.6	08/27/19	08/27/19 14:41	1053

Alkalinity Low Level — Analytical Method: SM 2320B -11

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Alkalinity, Total (as CaCO3)	**3.2**	mg/L	1.0		1	1	08/30/19	08/30/19 14:39	1053

Conductivity — Analytical Method: SM 2510B -2011

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Conductivity	**120**	us/cm	10		1	1	08/27/19	08/27/19 14:41	1061

Total Dissolved Solids (TDS) — Analytical Method: SM 2540C -2011 — Preparation Method: SM2540C

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Total Dissolved Solids	**82**	mg/L	10		1	10	08/29/19	08/30/19 13:00	1061

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-4 **Date/Time Sampled: 08/26/2019 11:15** **PSS Sample ID: 19082703-004**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

Qualifier(s): See Sample Receipt section on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
pH	**5.4**	S.U.			1		08/27/19	08/27/19 14:56	1061

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	0.1	08/28/19	08/28/19 13:22	1053

Chemical Oxygen Demand — Analytical Method: SM 5220D -2011

Qualifier(s): See Batch 167133 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	mg/L	5.0		1	5	08/27/19	08/27/19 14:23	1053

EDB & DBCP — Analytical Method: SW-846 8011

Qualifier(s): See Sample Receipt section on Case Narrative. See Batch 167596 on Case Narrative.

	Result	Units	RL	Flag	MDL	Prepared	Analyzed	Analyst
1,2-Dibromoethane	ND	ug/L	0.040		0.031	08/30/19	09/04/19 00:27	4003
1,2-Dibromo-3-Chloropropane	ND	ug/L	0.040		0.013	08/30/19	09/04/19 00:27	4003

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-4 **Date/Time Sampled: 08/26/2019 11:15** **PSS Sample ID: 19082703-004**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

Qualifier(s): See Batch 167153 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Vinyl chloride	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Bromomethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Chloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Acetone	ND	ug/L	10		1	5	08/27/19	08/27/19 20:06	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 20:06	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Methylene chloride	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Vinyl acetate	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
2-Butanone (MEK)	ND	ug/L	10		1	5	08/27/19	08/27/19 20:06	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Bromochloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Chloroform	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Carbon tetrachloride	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Benzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Dibromomethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Acrylonitrile	ND	ug/L	10		1	5	08/27/19	08/27/19 20:06	1011
Trichloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Carbon Disulfide	ND	ug/L	10		1	5	08/27/19	08/27/19 20:06	1011
Bromodichloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 20:06	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Toluene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
2-Hexanone (MBK)	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 20:06	1011
Dibromochloromethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Bromoform	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 20:06	1011

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-4 **Date/Time Sampled: 08/26/2019 11:15** **PSS Sample ID: 19082703-004**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

Qualifier(s): See Batch 167153 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
trans-1,4-dichloro-2-butene	ND	ug/L	5.0		1	2.5	08/27/19	08/27/19 20:06	1011
Tetrachloroethene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Chlorobenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Ethylbenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
m&p-Xylene	ND	ug/L	2.0		1	1	08/27/19	08/27/19 20:06	1011
Styrene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
o-Xylene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
1,2,3-Trichloropropane	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	0.5	08/27/19	08/27/19 20:06	1011
Iodomethane	ND	ug/L	20		1	10	08/27/19	08/27/19 20:06	1011

Surrogate(s)	*Recovery*		*Limits*					
4-Bromofluorobenzene	*112*	*%*	*87-109*	*	*1*	*08/27/19*	*08/27/19 20:06*	*1011*
Dibromofluoromethane	*110*	*%*	*93-111*		*1*	*08/27/19*	*08/27/19 20:06*	*1011*
Toluene-D8	*101*	*%*	*91-109*		*1*	*08/27/19*	*08/27/19 20:06*	*1011*

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-5 **Date/Time Sampled: 08/26/2019 10:35** **PSS Sample ID: 19082703-005**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Turbidity — Analytical Method: EPA 180.1

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Turbidity	**1.7**	NTU	0.50		1	0.31	08/27/19	08/27/19 15:07	1064

Total Metals (22 & Hardness) — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Antimony	ND	ug/L	5.0		1	0.72	08/28/19	08/28/19 18:27	1064
Arsenic	ND	ug/L	1.0		1	0.16	08/28/19	08/28/19 18:27	1064
Barium	**15.1**	ug/L	1.00		1	0.29	08/28/19	08/28/19 18:27	1064
Beryllium	ND	ug/L	1.0		1	0.25	08/28/19	08/28/19 18:27	1064
Cadmium	ND	ug/L	1.0		1	0.14	08/28/19	08/28/19 18:27	1064
Calcium	**6,040**	ug/L	2,000		20	720	08/28/19	08/29/19 18:15	1064
Chromium	**3.3**	ug/L	1.0		1	0.22	08/28/19	08/28/19 18:27	1064
Cobalt	**1.2**	ug/L	1.0		1	0.13	08/28/19	08/28/19 18:27	1064
Copper	ND	ug/L	1.0		1	0.8	08/28/19	08/28/19 18:27	1064
Iron	**40.2**	ug/L	100	J	1	21	08/28/19	08/28/19 18:27	1064
Lead	ND	ug/L	1.0		1	0.52	08/28/19	08/28/19 18:27	1064
Magnesium	**2,470**	ug/L	100		1	18	08/28/19	08/28/19 18:27	1064
Manganese	**59.1**	ug/L	1.00		1	0.4	08/28/19	08/28/19 18:27	1064
Mercury	ND	ug/L	0.20		1	0.034	08/28/19	08/28/19 18:27	1064
Nickel	**1.9**	ug/L	1.0		1	0.39	08/28/19	08/28/19 18:27	1064
Potassium	**2,040**	ug/L	100		1	37	08/28/19	08/28/19 18:27	1064
Selenium	ND	ug/L	1.0		1	0.21	08/28/19	08/28/19 18:27	1064
Silver	ND	ug/L	1.0		1	0.15	08/28/19	08/28/19 18:27	1064
Sodium	**2,930**	ug/L	100		1	72	08/28/19	08/28/19 18:27	1064
Thallium	ND	ug/L	1.0		1	0.25	08/28/19	08/28/19 18:27	1064
Vanadium	**0.17**	ug/L	1.0	J	1	0.13	08/28/19	08/28/19 18:27	1064
Zinc	**24.8**	ug/L	20.0		1	9.9	08/28/19	08/28/19 18:27	1064
Hardness (Ca & Mg)	**25**	mg/L	5.4		1	1.9	08/28/19	08/28/19 18:27	1064

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-5 **Date/Time Sampled: 08/26/2019 10:35** **PSS Sample ID: 19082703-005**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Chloride, Sulfate & Nitrate — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chloride	**4.5**	mg/L	5.0	J	1	0.5	08/27/19	08/27/19 15:06	1053
Nitrate (as N)	**4.7**	mg/L	0.10		1	0.044	08/27/19	08/27/19 15:06	1053
Sulfate	ND	mg/L	5.0		1	1.6	08/27/19	08/27/19 15:06	1053

Alkalinity Low Level — Analytical Method: SM 2320B -11

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Alkalinity, Total (as CaCO3)	**9.2**	mg/L	1.0		1	1	08/30/19	08/30/19 14:39	1053

Conductivity — Analytical Method: SM 2510B -2011

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Conductivity	**82**	us/cm	10		1	1	08/27/19	08/27/19 14:41	1061

Total Dissolved Solids (TDS) — Analytical Method: SM 2540C -2011 — Preparation Method: SM2540C

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Total Dissolved Solids	**54**	mg/L	10		1	10	08/29/19	08/30/19 13:00	1061

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-5 **Date/Time Sampled: 08/26/2019 10:35** **PSS Sample ID: 19082703-005**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

Qualifier(s): See Sample Receipt section on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
pH	**5.9**	S.U.			1		08/27/19	08/27/19 14:56	1061

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	0.1	08/28/19	08/28/19 13:26	1053

Chemical Oxygen Demand — Analytical Method: SM 5220D -2011

Qualifier(s): See Batch 167133 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	mg/L	5.0		1	5	08/27/19	08/27/19 14:23	1053

EDB & DBCP — Analytical Method: SW-846 8011

Qualifier(s): See Sample Receipt section on Case Narrative. See Batch 167596 on Case Narrative.

	Result	Units	RL	Flag	MDL	Prepared	Analyzed	Analyst
1,2-Dibromoethane	ND	ug/L	0.039		0.03	08/30/19	09/04/19 00:40	4003
1,2-Dibromo-3-Chloropropane	ND	ug/L	0.039		0.013	08/30/19	09/04/19 00:40	4003

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-5 **Date/Time Sampled: 08/26/2019 10:35** **PSS Sample ID: 19082703-005**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

Qualifier(s): See Batch 167200 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Vinyl chloride	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Bromomethane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Chloroethane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Acetone	ND	ug/L	10		1	5	08/28/19	08/28/19 11:30	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	2.5	08/28/19	08/28/19 11:30	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Methylene chloride	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Methyl-t-Butyl Ether	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Vinyl acetate	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
2-Butanone (MEK)	ND	ug/L	10		1	5	08/28/19	08/28/19 11:30	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Bromochloromethane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Chloroform	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Carbon tetrachloride	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Benzene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Dibromomethane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Acrylonitrile	ND	ug/L	10		1	5	08/28/19	08/28/19 11:30	1011
Trichloroethene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Carbon Disulfide	ND	ug/L	10		1	5	08/28/19	08/28/19 11:30	1011
Bromodichloromethane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/L	5.0		1	2.5	08/28/19	08/28/19 11:30	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Toluene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
2-Hexanone (MBK)	ND	ug/L	5.0		1	2.5	08/28/19	08/28/19 11:30	1011
Dibromochloromethane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Bromoform	ND	ug/L	5.0		1	2.5	08/28/19	08/28/19 11:30	1011

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Project Name: Dulin Landfill
PSS Project No.: 19082703

Sample ID: MW-5 **Date/Time Sampled: 08/26/2019 10:35** **PSS Sample ID: 19082703-005**
Matrix: GROUND WATER **Date/Time Received: 08/27/2019 08:45**

Volatile Organic Compounds MDE List Analytical Method: SW-846 8260 B Preparation Method: 5030B

Qualifier(s): See Batch 167200 on Case Narrative.

	Result	Units	RL	Flag	Dil	MDL	Prepared	Analyzed	Analyst
trans-1,4-dichloro-2-butene	ND	ug/L	5.0		1	2.5	08/28/19	08/28/19 11:30	1011
Tetrachloroethene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Chlorobenzene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Ethylbenzene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
m&p-Xylene	ND	ug/L	2.0		1	1	08/28/19	08/28/19 11:30	1011
Styrene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
o-Xylene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
1,2,3-Trichloropropane	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	0.5	08/28/19	08/28/19 11:30	1011
Iodomethane	ND	ug/L	20		1	10	08/28/19	08/28/19 11:30	1011

Surrogate(s)	*Recovery*		*Limits*					
4-Bromofluorobenzene	*112*	*%*	*87-109*	*	*1*	*08/28/19*	*08/28/19 11:30*	*1011*
Dibromofluoromethane	*111*	*%*	*93-111*		*1*	*08/28/19*	*08/28/19 11:30*	*1011*
Toluene-D8	*100*	*%*	*91-109*		*1*	*08/28/19*	*08/28/19 11:30*	*1011*

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Project Name: Dulin Landfill

PSS Project No.: 19082703

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

19082703: Analyses associated with analyst code 4003 were performed by
Pace Analytical Svc's., LLC - Pittsburgh PA, 1638 Roseytown, Suites 2, 3 & 4, Greensburg, PA 15601 - PA 02-00282 VA 460198

Analytical:

Total Metals (22 & Hardness)

Batch: 167259
Continuing Calibration Verification (CCV) #1 exceeded acceptance limits (85% - 115%) for sodium at 83% recovery.

Analytical:

Chemical Oxygen Demand

Batch: 167133
Matrix spike (MS) and Relative Percent Difference (RPD) exceedances identified; see QC summary.

Analytical:

EDB & DBCP

Batch: 167596
No Trip blanks received with the samples.
This sample was re-extracted past holding time due to a failure in the original batch Laboratory Control Sample (LCS). The original and re-extracted results were comparable. The original, in hold, results are reported
Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

Analytical:

Volatile Organic Compounds MDE List

Batch: 167153
Laboratory control sample exceedances identified; see QC summary.
Method Blank = Surrogate exceedances identified, see QC summary.

Batch: 167200
Method Blank = Surrogate exceedances identified, see QC summary.
Laboratory control sample exceedances identified; see QC summary.

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Project Name: Dulin Landfill

PSS Project No.: 19082703

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

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Lab Chronology

Project Name: Dulin Landfill
PSS Project No.: 19082703

Method	Client Sample ID	Analysis Type	PSS Sample ID	Mtx	Prep Batch	Analytical Batch	Prepared	Analyzed
EPA 180.1	MW-1	Initial	19082703-001	W	167139	167139	08/27/2019 15:07	08/27/2019 15:07
	MW-2	Initial	19082703-002	W	167139	167139	08/27/2019 15:07	08/27/2019 15:07
	MW-3	Initial	19082703-003	W	167139	167139	08/27/2019 15:07	08/27/2019 15:07
	MW-4	Initial	19082703-004	W	167139	167139	08/27/2019 15:07	08/27/2019 15:07
	MW-5	Initial	19082703-005	W	167139	167139	08/27/2019 15:07	08/27/2019 15:07
	167139-1-BLK	BLK	167139-1-BLK	W	167139	167139	08/27/2019 15:07	08/27/2019 15:07
	MW-1 D	MD	19082703-001 D	W	167139	167139	08/27/2019 15:07	08/27/2019 15:07
EPA 200.8	MW-1	Initial	19082703-001	W	78228	167229	08/28/2019 16:00	08/28/2019 17:54
	MW-2	Initial	19082703-002	W	78228	167229	08/28/2019 16:00	08/28/2019 18:10
	MW-3	Initial	19082703-003	W	78228	167229	08/28/2019 16:00	08/28/2019 18:16
	MW-4	Initial	19082703-004	W	78228	167229	08/28/2019 16:00	08/28/2019 18:21
	MW-5	Initial	19082703-005	W	78228	167229	08/28/2019 16:00	08/28/2019 18:27
	78228-1-BKS	BKS	78228-1-BKS	W	78228	167229	08/28/2019 16:00	08/28/2019 17:26
	78228-1-BLK	BLK	78228-1-BLK	W	78228	167229	08/28/2019 16:00	08/28/2019 17:20
	MW-1 S	MS	19082703-001 S	W	78228	167229	08/28/2019 16:00	08/28/2019 17:59
	MW-1 S	Reanalysis	19082703-001 S	W	78228	167229	08/28/2019 16:00	08/28/2019 17:59
	MW-1 SD	MSD	19082703-001 S	W	78228	167229	08/28/2019 16:00	08/28/2019 18:05
	MW-1 SD	Reanalysis	19082703-001 S	W	78228	167229	08/28/2019 16:00	08/28/2019 18:05
	MW-1	Reanalysis	19082703-001	W	78228	167259	08/28/2019 16:00	08/29/2019 17:41
	MW-2	Reanalysis	19082703-002	W	78228	167259	08/28/2019 16:00	08/29/2019 17:58
	MW-3	Reanalysis	19082703-003	W	78228	167259	08/28/2019 16:00	08/29/2019 18:04
	MW-4	Reanalysis	19082703-004	W	78228	167259	08/28/2019 16:00	08/29/2019 18:09
	MW-5	Reanalysis	19082703-005	W	78228	167259	08/28/2019 16:00	08/29/2019 18:15
EPA 300.0	MW-1	Initial	19082703-001	W	78209	167157	08/27/2019 10:32	08/27/2019 13:27
	MW-2	Initial	19082703-002	W	78209	167157	08/27/2019 10:32	08/27/2019 13:52
	MW-3	Initial	19082703-003	W	78209	167157	08/27/2019 10:32	08/27/2019 14:17
	MW-4	Initial	19082703-004	W	78209	167157	08/27/2019 10:32	08/27/2019 14:41
	MW-5	Initial	19082703-005	W	78209	167157	08/27/2019 10:32	08/27/2019 15:06
	78209-1-BKS	BKS	78209-1-BKS	W	78209	167157	08/27/2019 10:32	08/27/2019 11:23
	78209-1-BLK	BLK	78209-1-BLK	W	78209	167157	08/27/2019 10:32	08/27/2019 10:58
	78209-1-BSD	BSD	78209-1-BSD	W	78209	167157	08/27/2019 10:32	08/27/2019 11:48
	Bathroom Sink S	MS	19082702-001 S	W	78209	167157	08/27/2019 10:32	08/27/2019 13:02
SM 2320B -11	MW-1	Initial	19082703-001	W	167272	167272	08/30/2019 14:39	08/30/2019 14:39
	MW-2	Initial	19082703-002	W	167272	167272	08/30/2019 14:39	08/30/2019 14:39
	MW-3	Initial	19082703-003	W	167272	167272	08/30/2019 14:39	08/30/2019 14:39
	MW-4	Initial	19082703-004	W	167272	167272	08/30/2019 14:39	08/30/2019 14:39
	MW-5	Initial	19082703-005	W	167272	167272	08/30/2019 14:39	08/30/2019 14:39
	167272-1-LCS	BKS	167272-1-LCS	W	167272	167272	08/30/2019 14:39	08/30/2019 14:39
	167272-1-BLK	BLK	167272-1-BLK	W	167272	167272	08/30/2019 14:39	08/30/2019 14:39
	MW-1 D	MD	19082703-001 D	W	167272	167272	08/30/2019 14:39	08/30/2019 14:39
SM 2510B -2011	MW-1	Initial	19082703-001	W	167134	167134	08/27/2019 14:41	08/27/2019 14:41
	MW-2	Initial	19082703-002	W	167134	167134	08/27/2019 14:41	08/27/2019 14:41
	MW-3	Initial	19082703-003	W	167134	167134	08/27/2019 14:41	08/27/2019 14:41
	MW-4	Initial	19082703-004	W	167134	167134	08/27/2019 14:41	08/27/2019 14:41

PHASE SEPARATION SCIENCE

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Lab Chronology

Project Name: Dulin Landfill
PSS Project No.: 19082703

Method	Client Sample ID	Analysis Type	PSS Sample ID	Mtx	Prep Batch	Analytical Batch	Prepared	Analyzed
SM 2510B -2011	MW-5	Initial	19082703-005	W	167134	167134	08/27/2019 14:41	08/27/2019 14:41
	167134-1-BKS	BKS	167134-1-BKS	W	167134	167134	08/27/2019 14:41	08/27/2019 14:41
	MW-1 D	MD	19082703-001 D	W	167134	167134	08/27/2019 14:41	08/27/2019 14:41
SM 2540C -2011	MW-1	Initial	19082703-001	W	78246	167265	08/29/2019 12:59	08/30/2019 13:00
	MW-2	Initial	19082703-002	W	78246	167265	08/29/2019 12:59	08/30/2019 13:00
	MW-3	Initial	19082703-003	W	78246	167265	08/29/2019 12:59	08/30/2019 13:00
	MW-4	Initial	19082703-004	W	78246	167265	08/29/2019 12:59	08/30/2019 13:00
	MW-5	Initial	19082703-005	W	78246	167265	08/29/2019 12:59	08/30/2019 13:00
	78246-1-LCS	BKS	78246-1-LCS	W	78246	167265	08/29/2019 12:59	08/30/2019 13:00
	BLK	BLK	BLK	W	78246	167265	08/29/2019 12:59	08/30/2019 13:00
	MW-1 D	MD	19082703-001 D	W	78246	167265	08/29/2019 12:59	08/30/2019 13:00
	MW 8s D	MD	19082807-005 D	W	78246	167265	08/29/2019 12:59	08/30/2019 13:00
SM 4500-H+ B -2011	MW-1	Initial	19082703-001	W	167138	167138	08/27/2019 14:56	08/27/2019 14:56
	MW-2	Initial	19082703-002	W	167138	167138	08/27/2019 14:56	08/27/2019 14:56
	MW-3	Initial	19082703-003	W	167138	167138	08/27/2019 14:56	08/27/2019 14:56
	MW-4	Initial	19082703-004	W	167138	167138	08/27/2019 14:56	08/27/2019 14:56
	MW-5	Initial	19082703-005	W	167138	167138	08/27/2019 14:56	08/27/2019 14:56
	MW-1 D	MD	19082703-001 D	W	167138	167138	08/27/2019 14:56	08/27/2019 14:56
SM 4500-NH3-F -2011	MW-1	Initial	19082703-001	W	78223	167177	08/28/2019 10:15	08/28/2019 13:02
	MW-2	Initial	19082703-002	W	78223	167177	08/28/2019 10:15	08/28/2019 13:14
	MW-3	Initial	19082703-003	W	78223	167177	08/28/2019 10:15	08/28/2019 13:18
	MW-4	Initial	19082703-004	W	78223	167177	08/28/2019 10:15	08/28/2019 13:22
	MW-5	Initial	19082703-005	W	78223	167177	08/28/2019 10:15	08/28/2019 13:26
	78223-1-BKS	BKS	78223-1-BKS	W	78223	167177	08/28/2019 10:15	08/28/2019 12:54
	78223-1-BLK	BLK	78223-1-BLK	W	78223	167177	08/28/2019 10:15	08/28/2019 12:50
	78223-1-BSD	BSD	78223-1-BSD	W	78223	167177	08/28/2019 10:15	08/28/2019 12:58
	MW-1 S	MS	19082703-001 S	W	78223	167177	08/28/2019 10:15	08/28/2019 13:06
	MW-1 SD	MSD	19082703-001 S	W	78223	167177	08/28/2019 10:15	08/28/2019 13:10
SM 5220D -2011	MW-1	Initial	19082703-001	W	167133	167133	08/27/2019 14:23	08/27/2019 14:23
	MW-2	Initial	19082703-002	W	167133	167133	08/27/2019 14:23	08/27/2019 14:23
	MW-3	Initial	19082703-003	W	167133	167133	08/27/2019 14:23	08/27/2019 14:23
	MW-4	Initial	19082703-004	W	167133	167133	08/27/2019 14:23	08/27/2019 14:23
	MW-5	Initial	19082703-005	W	167133	167133	08/27/2019 14:23	08/27/2019 14:23
	167133-1-BKS	BKS	167133-1-BKS	W	167133	167133	08/27/2019 14:23	08/27/2019 14:23
	167133-1-BLK	BLK	167133-1-BLK	W	167133	167133	08/27/2019 14:23	08/27/2019 14:23
	MW-1 S	MS	19082703-001 S	W	167133	167133	08/27/2019 14:23	08/27/2019 14:23
	MW-1 SD	MSD	19082703-001 S	W	167133	167133	08/27/2019 14:23	08/27/2019 14:23
SW-846 8011	MW-1	Initial	19082703-001	W	167596	167596	08/30/2019 00:00	09/03/2019 23:24
	MW-2	Initial	19082703-002	W	167596	167596	08/30/2019 00:00	09/03/2019 23:37
	MW-3	Initial	19082703-003	W	167596	167596	08/30/2019 00:00	09/04/2019 00:14
	MW-4	Initial	19082703-004	W	167596	167596	08/30/2019 00:00	09/04/2019 00:27
	MW-5	Initial	19082703-005	W	167596	167596	08/30/2019 00:00	09/04/2019 00:40
SW-846 8260 B	MW-1	Initial	19082703-001	W	78222	167153	08/27/2019 08:18	08/27/2019 18:58

PHASE SEPARATION SCIENCE

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Lab Chronology

Project Name: Dulin Landfill
PSS Project No.: 19082703

Method	Client Sample ID	Analysis Type	PSS Sample ID	Mtx	Prep Batch	Analytical Batch	Prepared	Analyzed
SW-846 8260 B	MW-2	Initial	19082703-002	W	78222	167153	08/27/2019 08:18	08/27/2019 19:21
	MW-3	Initial	19082703-003	W	78222	167153	08/27/2019 08:18	08/27/2019 19:44
	MW-4	Initial	19082703-004	W	78222	167153	08/27/2019 08:18	08/27/2019 20:06
	78222-1-BKS	BKS	78222-1-BKS	W	78222	167153	08/27/2019 08:18	08/27/2019 09:20
	78222-1-BLK	BLK	78222-1-BLK	W	78222	167153	08/27/2019 08:18	08/27/2019 10:51
	TW-10 S	MS	19082319-006 S	W	78222	167153	08/27/2019 08:18	08/27/2019 16:43
	TW-10 SD	MSD	19082319-006 S	W	78222	167153	08/27/2019 08:18	08/27/2019 17:05
	MW-5	Initial	19082703-005	W	78234	167200	08/28/2019 08:32	08/28/2019 11:30
	78234-1-BKS	BKS	78234-1-BKS	W	78234	167200	08/28/2019 08:32	08/28/2019 09:37
	78234-1-BLK	BLK	78234-1-BLK	W	78234	167200	08/28/2019 08:32	08/28/2019 11:08
	MW-5 S	MS	19082703-005 S	W	78234	167200	08/28/2019 08:32	08/28/2019 14:44
	MW-5 SD	MSD	19082703-005 S	W	78234	167200	08/28/2019 08:32	08/28/2019 15:07

Analytical Method: EPA 180.1
Seq Number: 167139 Matrix: Water
MB Sample Id: 167139-1-BLK

Parameter	MB Result	LOD	RL	Units	Flag
Turbidity	ND	0.3100	0.5000	NTU	

Analytical Method: EPA 180.1
Seq Number: 167139 Matrix: Ground Water
Parent Sample Id: 19082703-001 MD Sample Id: 19082703-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Flag
Turbidity	0.9700	0.9400	3	20	NTU	

Analytical Method: SM 2320B -11
Seq Number: 167272 Matrix: Water
MB Sample Id: 167272-1-LCS LCS Sample Id: 167272-1-LCS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Alkalinity, Total (as CaCO3)		6.000	5.800	97	80-120	mg/L	

Analytical Method: SM 2320B -11
Seq Number: 167272 Matrix: Ground Water
Parent Sample Id: 19082703-001 MD Sample Id: 19082703-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Flag
Alkalinity, Total (as CaCO3)	1.100	1.200	9	30	mg/L	

Analytical Method: SM 2510B -2011
Seq Number: 167134 Matrix: Ground Water
Parent Sample Id: 19082703-001 MD Sample Id: 19082703-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Flag
Conductivity	189.5	189.7	0	20	us/cm	

Analytical Method: SM 2540C -2011 Prep Method: SM2540C_Prep
Seq Number: 167265 Matrix: Water Date Prep: 08/29/19
MB Sample Id: 78246-1-LCS LCS Sample Id: 78246-1-LCS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Total Dissolved Solids		500	494	99	80-120	mg/L	

Analytical Method: SM 2540C -2011 Prep Method: SM2540C_Prep
Seq Number: 167265 Matrix: Water Date Prep: 08/29/19
MB Sample Id: BLK

Parameter	MB Result	LOD	RL	Units	Flag
Total Dissolved Solids	ND	1.000	1.000	mg/L	

Analytical Method: SM 2540C -2011 Prep Method: SM2540C_Prep
Seq Number: 167265 Matrix: Ground Water Date Prep: 08/29/19
Parent Sample Id: 19082703-001 MD Sample Id: 19082703-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Flag
Total Dissolved Solids	132	142	7	10	mg/L	

Analytical Method: SM 4500-H+ B -2011
Seq Number: 167138 Matrix: Ground Water
Parent Sample Id: 19082703-001 MD Sample Id: 19082703-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Flag
pH	5.578	5.564	0	20	S.U.	

Analytical Method: SM 4500-NH3-F -2011 Prep Method: SM4500-NH3B
Seq Number: 167177 Matrix: Water Date Prep: 08/28/19
MB Sample Id: 78223-1-BLK LCS Sample Id: 78223-1-BKS LCSD Sample Id: 78223-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
Nitrogen, Ammonia (as N)	<0.1000	2.500	2.593	104	2.518	101	85-115	3	20	mg/L	

Analytical Method: SM 4500-NH3-F -2011 Prep Method: SM4500-NH3B
Seq Number: 167177 Matrix: Ground Water Date Prep: 08/28/19
Parent Sample Id: 19082703-001 MS Sample Id: 19082703-001 S MSD Sample Id: 19082703-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
Nitrogen, Ammonia (as N)	<0.1000	2.500	2.522	101	2.554	102	80-120	1	20	mg/L	

Analytical Method: SM 5220D -2011
Seq Number: 167133 Matrix: Water
MB Sample Id: 167133-1-BLK LCS Sample Id: 167133-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Chemical Oxygen Demand	<5.000	100.4	115	115	85-115	mg/L	

Analytical Method: SM 5220D -2011

Seq Number: 167133 Matrix: Ground Water
Parent Sample Id: 19082703-001 MS Sample Id: 19082703-001 S MSD Sample Id: 19082703-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
Chemical Oxygen Demand	6.000	50.20	74.00	135	58.00	104	80-120	26	20	mg/L	XF

Analytical Method: EPA 200.8

Prep Method: E200.8_PREP
Seq Number: 167229 Matrix: Water Date Prep: 08/28/19
MB Sample Id: 78228-1-BLK LCS Sample Id: 78228-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Antimony	<0.7200	40.00	41.44	104	85-115	ug/L	
Arsenic	<0.1600	40.00	38.77	97	85-115	ug/L	
Barium	<0.2900	40.00	40.49	101	85-115	ug/L	
Beryllium	<0.2500	40.00	39.79	99	85-115	ug/L	
Cadmium	<0.1400	40.00	38.38	96	85-115	ug/L	
Calcium	<36.00	400	443.4	111	85-115	ug/L	
Chromium	<0.2200	40.00	39.65	99	85-115	ug/L	
Cobalt	<0.1300	40.00	41.43	104	85-115	ug/L	
Copper	<0.8000	40.00	40.81	102	85-115	ug/L	
Iron	<21.00	400	422.2	106	85-115	ug/L	
Lead	<0.5200	40.00	38.65	97	85-115	ug/L	
Magnesium	<18.00	400	396.3	99	85-115	ug/L	
Manganese	<0.4000	40.00	39.40	99	85-115	ug/L	
Mercury	<0.03400	1.000	0.9390	94	85-115	ug/L	
Nickel	<0.3900	40.00	38.98	97	85-115	ug/L	
Potassium	<37.00	400	401.8	100	85-115	ug/L	
Selenium	<0.2100	40.00	41.56	104	85-115	ug/L	
Silver	<0.1500	40.00	39.82	100	85-115	ug/L	
Sodium	<72.00	400	400.4	100	85-115	ug/L	
Thallium	<0.2500	40.00	38.34	96	85-115	ug/L	
Vanadium	<0.1300	40.00	38.89	97	85-115	ug/L	
Zinc	<9.900	200	199.7	100	85-115	ug/L	

Analytical Method: EPA 200.8

Prep Method: E200.8_PREP
Seq Number: 167229 Matrix: Water Date Prep: 08/28/19
MB Sample Id: 78228-1-BLK

Parameter	MB Result	LOD	RL	Units	Flag
Hardness (Ca & Mg)	ND	0.7000	0.7000	mg/L	

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QC Summary

Project Name Dulin Landfill
PSS Project No.: 19082703

Analytical Method: EPA 200.8
Prep Method: E200.8_PREP
Seq Number: 167229 Matrix: Ground Water Date Prep: 08/28/19
Parent Sample Id: 19082703-001 MS Sample Id: 19082703-001 S MSD Sample Id: 19082703-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
Antimony	<0.7200	40.00	40.65	102	40.90	102	70-130	0	25	ug/L	
Arsenic	<0.1600	40.00	38.95	97	39.09	98	70-130	1	25	ug/L	
Barium	74.90	40.00	118.8	110	114.9	100	70-130	10	25	ug/L	
Beryllium	<0.2500	40.00	42.44	106	42.30	106	70-130	0	25	ug/L	
Cadmium	<0.1400	40.00	38.67	97	38.76	97	70-130	0	25	ug/L	
Calcium	13100	400	14040	235	13270	43	70-130	138	25	ug/L	XF
Chromium	1.417	40.00	41.25	100	41.41	100	70-130	0	25	ug/L	
Cobalt	0.7820	40.00	40.38	99	40.29	99	70-130	0	25	ug/L	
Copper	<0.8000	40.00	39.15	98	39.03	98	70-130	0	25	ug/L	
Iron	23.38	400	420	99	436.8	103	70-130	4	25	ug/L	
Lead	<0.5200	40.00	38.79	97	39.20	98	70-130	1	25	ug/L	
Magnesium	5019	400	5628	152	5272	63	70-130	83	25	ug/L	XF
Manganese	17.14	40.00	57.89	102	56.76	99	70-130	3	25	ug/L	
Mercury	<0.03400	1.000	0.9790	98	0.9940	99	70-130	1	25	ug/L	
Nickel	5.359	40.00	42.97	94	42.53	93	70-130	1	25	ug/L	
Potassium	3183	400	3753	143	3449	67	70-130	72	25	ug/L	XF
Selenium	<0.2100	40.00	38.05	95	38.95	97	70-130	2	25	ug/L	
Silver	<0.1500	40.00	39.67	99	39.77	99	70-130	0	25	ug/L	
Sodium	10780	400	11590	203	10780	0	70-130	200	25	ug/L	XF
Thallium	<0.2500	40.00	39.35	98	39.26	98	70-130	0	25	ug/L	
Vanadium	<0.1300	40.00	39.53	99	39.89	100	70-130	1	25	ug/L	
Zinc	30.25	200	222.9	96	220.6	95	70-130	1	25	ug/L	

Analytical Method: EPA 300.0
Prep Method: E300.0P
Seq Number: 167157 Matrix: Water Date Prep: 08/27/19
MB Sample Id: 78209-1-BLK LCS Sample Id: 78209-1-BKS LCSD Sample Id: 78209-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
Chloride	<0.5000	50.00	50.70	101	51.43	103	90-110	2	20	mg/L	
Nitrate (as N)	<0.04400	5.000	5.253	105	5.330	107	90-110	2	20	mg/L	
Sulfate	<1.600	50.00	50.89	102	51.62	103	90-110	1	20	mg/L	

PHASE SEPARATION SCIENCE

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QC Summary

Project Name Dulin Landfill
PSS Project No.: 19082703

Analytical Method: SW-846 8260 B
Seq Number: 167153
MB Sample Id: 78222-1-BLK

Matrix: Water
LCS Sample Id: 78222-1-BKS

Prep Method: SW5030B
Date Prep: 08/27/19

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Chloromethane	<0.5000	50.00	54.17	108	59-121	ug/L	
Vinyl chloride	<0.5000	50.00	59.67	119	66-133	ug/L	
Bromomethane	<0.5000	50.00	53.17	106	45-167	ug/L	
Chloroethane	<0.5000	50.00	52.86	106	81-122	ug/L	
Acetone	<5.000	50.00	37.20	74	55-120	ug/L	
Trichlorofluoromethane	<2.500	50.00	56.64	113	85-130	ug/L	
1,1-Dichloroethene	<0.5000	50.00	46.58	93	85-123	ug/L	
Methylene chloride	<0.5000	50.00	45.79	92	85-119	ug/L	
trans-1,2-Dichloroethene	<0.5000	50.00	46.08	92	87-120	ug/L	
Methyl-t-Butyl Ether	<0.5000	50.00	48.90	98	61-130	ug/L	
1,1-Dichloroethane	<0.5000	50.00	52.34	105	85-120	ug/L	
Vinyl acetate	<0.5000	50.00	57.15	114	62-113	ug/L	H
2-Butanone (MEK)	<5.000	50.00	40.75	82	45-136	ug/L	
cis-1,2-Dichloroethene	<0.5000	50.00	47.68	95	86-126	ug/L	
Bromochloromethane	<0.5000	50.00	50.94	102	74-136	ug/L	
Chloroform	<0.5000	50.00	51.24	102	76-129	ug/L	
1,1,1-Trichloroethane	<0.5000	50.00	52.92	106	87-125	ug/L	
1,2-Dichloroethane	<0.5000	50.00	57.42	115	86-125	ug/L	
Carbon tetrachloride	<0.5000	50.00	54.00	108	79-133	ug/L	
Benzene	<0.5000	50.00	48.67	97	87-123	ug/L	
Dibromomethane	<0.5000	50.00	50.32	101	80-132	ug/L	
1,2-Dichloropropane	<0.5000	50.00	50.76	102	83-120	ug/L	
Acrylonitrile	<5.000	50.00	46.46	93	66-132	ug/L	
Trichloroethene	<0.5000	50.00	47.27	95	87-124	ug/L	
Carbon Disulfide	<5.000	50.00	46.50	93	87-123	ug/L	
Bromodichloromethane	<0.5000	50.00	52.56	105	83-125	ug/L	
cis-1,3-Dichloropropene	<0.5000	50.00	50.18	100	81-125	ug/L	
4-Methyl-2-Pentanone (MIBK)	<2.500	50.00	47.96	96	57-116	ug/L	
trans-1,3-Dichloropropene	<0.5000	50.00	50.57	101	79-121	ug/L	
1,1,2-Trichloroethane	<0.5000	50.00	48.68	97	84-127	ug/L	
Toluene	<0.5000	50.00	47.07	94	82-127	ug/L	
2-Hexanone (MBK)	<2.500	50.00	44.47	89	56-116	ug/L	
Dibromochloromethane	<0.5000	50.00	49.59	99	73-139	ug/L	
1,1,1,2-Tetrachloroethane	<0.5000	50.00	48.35	97	80-133	ug/L	
Bromoform	<2.500	50.00	42.77	86	72-129	ug/L	
trans-1,4-dichloro-2-butene	<2.500	50.00	53.17	106	56-122	ug/L	
Tetrachloroethene	<0.5000	50.00	46.20	92	85-131	ug/L	
Chlorobenzene	<0.5000	50.00	46.84	94	87-127	ug/L	
Ethylbenzene	<0.5000	50.00	49.68	99	82-128	ug/L	
m&p-Xylene	<1.000	100	96.52	97	78-126	ug/L	
Styrene	<0.5000	50.00	48.28	97	76-130	ug/L	
1,1,2,2-Tetrachloroethane	<0.5000	50.00	51.11	102	79-131	ug/L	
o-Xylene	<0.5000	50.00	48.38	97	75-130	ug/L	
1,2,3-Trichloropropane	<0.5000	50.00	50.96	102	69-130	ug/L	
1,4-Dichlorobenzene	<0.5000	50.00	47.92	96	84-129	ug/L	
1,2-Dichlorobenzene	<0.5000	50.00	47.42	95	82-129	ug/L	
Iodomethane	<10.00	50.00	41.50	83	63-113	ug/L	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units
4-Bromofluorobenzene	111	*	106		87-109	%
Dibromofluoromethane	106		109		93-111	%

PHASE SEPARATION SCIENCE

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QC Summary

Project Name Dulin Landfill
PSS Project No.: 19082703

Analytical Method: SW-846 8260 B

Prep Method: SW5030B

Seq Number: 167153 | Matrix: Water | Date Prep: 08/27/19

MB Sample Id: 78222-1-BLK | LCS Sample Id: 78222-1-BKS

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units
Toluene-D8	101		101		91-109	%

PHASE SEPARATION SCIENCE

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QC Summary

Project Name Dulin Landfill
PSS Project No.: 19082703

Analytical Method: SW-846 8260 B
Seq Number: 167200
MB Sample Id: 78234-1-BLK

Matrix: Water
LCS Sample Id: 78234-1-BKS

Prep Method: SW5030B
Date Prep: 08/28/19

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Chloromethane	<0.5000	50.00	56.45	113	59-121	ug/L	
Vinyl chloride	<0.5000	50.00	60.92	122	66-133	ug/L	
Bromomethane	<0.5000	50.00	52.09	104	45-167	ug/L	
Chloroethane	<0.5000	50.00	52.21	104	81-122	ug/L	
Acetone	<5.000	50.00	40.57	81	55-120	ug/L	
Trichlorofluoromethane	<2.500	50.00	57.58	115	85-130	ug/L	
1,1-Dichloroethene	<0.5000	50.00	45.42	91	85-123	ug/L	
Methylene chloride	<0.5000	50.00	44.75	90	85-119	ug/L	
trans-1,2-Dichloroethene	<0.5000	50.00	45.06	90	87-120	ug/L	
Methyl-t-Butyl Ether	<0.5000	50.00	48.30	97	61-130	ug/L	
1,1-Dichloroethane	<0.5000	50.00	52.44	105	85-120	ug/L	
Vinyl acetate	<0.5000	50.00	58.47	117	62-113	ug/L	H
2-Butanone (MEK)	<5.000	50.00	41.46	83	45-136	ug/L	
cis-1,2-Dichloroethene	<0.5000	50.00	46.49	93	86-126	ug/L	
Bromochloromethane	<0.5000	50.00	49.58	99	74-136	ug/L	
Chloroform	<0.5000	50.00	51.55	103	76-129	ug/L	
1,1,1-Trichloroethane	<0.5000	50.00	52.91	106	87-125	ug/L	
1,2-Dichloroethane	<0.5000	50.00	58.50	117	86-125	ug/L	
Carbon tetrachloride	<0.5000	50.00	53.33	107	79-133	ug/L	
Benzene	<0.5000	50.00	46.94	94	87-123	ug/L	
Dibromomethane	<0.5000	50.00	50.08	100	80-132	ug/L	
1,2-Dichloropropane	<0.5000	50.00	49.25	99	83-120	ug/L	
Acrylonitrile	<5.000	50.00	47.42	95	66-132	ug/L	
Trichloroethene	<0.5000	50.00	46.14	92	87-124	ug/L	
Carbon Disulfide	<5.000	50.00	45.22	90	87-123	ug/L	
Bromodichloromethane	<0.5000	50.00	52.61	105	83-125	ug/L	
cis-1,3-Dichloropropene	<0.5000	50.00	48.49	97	81-125	ug/L	
4-Methyl-2-Pentanone (MIBK)	<2.500	50.00	48.45	97	57-116	ug/L	
trans-1,3-Dichloropropene	<0.5000	50.00	50.02	100	79-121	ug/L	
1,1,2-Trichloroethane	<0.5000	50.00	47.92	96	84-127	ug/L	
Toluene	<0.5000	50.00	45.22	90	82-127	ug/L	
2-Hexanone (MBK)	<2.500	50.00	46.15	92	56-116	ug/L	
Dibromochloromethane	<0.5000	50.00	49.64	99	73-139	ug/L	
1,1,1,2-Tetrachloroethane	<0.5000	50.00	49.31	99	80-133	ug/L	
Bromoform	<2.500	50.00	42.34	85	72-129	ug/L	
trans-1,4-dichloro-2-butene	<2.500	50.00	55.86	112	56-122	ug/L	
Tetrachloroethene	<0.5000	50.00	43.56	87	85-131	ug/L	
Chlorobenzene	<0.5000	50.00	46.06	92	87-127	ug/L	
Ethylbenzene	<0.5000	50.00	49.68	99	82-128	ug/L	
m&p-Xylene	<1.000	100	95.00	95	78-126	ug/L	
Styrene	<0.5000	50.00	47.69	95	76-130	ug/L	
1,1,2,2-Tetrachloroethane	<0.5000	50.00	51.89	104	79-131	ug/L	
o-Xylene	<0.5000	50.00	48.03	96	75-130	ug/L	
1,2,3-Trichloropropane	<0.5000	50.00	51.98	104	69-130	ug/L	
1,4-Dichlorobenzene	<0.5000	50.00	47.26	95	84-129	ug/L	
1,2-Dichlorobenzene	<0.5000	50.00	46.61	93	82-129	ug/L	
Iodomethane	<10.00	50.00	40.37	81	63-113	ug/L	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units
4-Bromofluorobenzene	112	*	106		87-109	%
Dibromofluoromethane	108		110		93-111	%

PHASE SEPARATION SCIENCE

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QC Summary

Project Name Dulin Landfill
PSS Project No.: 19082703

Analytical Method: SW-846 8260 B

Prep Method: SW5030B

Seq Number: 167200 | Matrix: Water | Date Prep: 08/28/19

MB Sample Id: 78234-1-BLK | LCS Sample Id: 78234-1-BKS

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units
Toluene-D8	100		99		91-109	%

PHASE SEPARATION SCIENCE

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QC Summary

Project Name Dulin Landfill
PSS Project No.: 19082703

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 167200 Matrix: Ground Water Date Prep: 08/28/19
Parent Sample Id: 19082703-005 MS Sample Id: 19082703-005 S MSD Sample Id: 19082703-005 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
Chloromethane	<0.5000	50.00	53.56	107	54.32	109	46-143	2	25	ug/L	
Vinyl chloride	<0.5000	50.00	62.60	125	62.67	125	79-128	0	25	ug/L	
Bromomethane	<0.5000	50.00	48.42	97	49.33	99	48-166	2	25	ug/L	
Chloroethane	<0.5000	50.00	51.10	102	52.22	104	72-142	2	25	ug/L	
Acetone	<5.000	50.00	34.54	69	37.03	74	50-156	7	25	ug/L	
Trichlorofluoromethane	<2.500	50.00	57.88	116	56.14	112	80-145	4	25	ug/L	
1,1-Dichloroethene	<0.5000	50.00	43.44	87	42.37	85	74-142	2	25	ug/L	
Methylene chloride	<0.5000	50.00	43.35	87	42.52	85	73-141	2	25	ug/L	
trans-1,2-Dichloroethene	<0.5000	50.00	42.34	85	41.09	82	75-142	4	25	ug/L	
Methyl-t-Butyl Ether	<0.5000	50.00	48.19	96	47.43	95	45-143	1	25	ug/L	
1,1-Dichloroethane	<0.5000	50.00	52.58	105	50.55	101	76-139	4	25	ug/L	
Vinyl acetate	<0.5000	50.00	60.55	121	60.46	121	57-123	0	25	ug/L	
2-Butanone (MEK)	<5.000	50.00	37.99	76	39.45	79	68-127	4	25	ug/L	
cis-1,2-Dichloroethene	<0.5000	50.00	42.68	85	41.76	84	80-142	1	25	ug/L	
Bromochloromethane	<0.5000	50.00	45.22	90	43.38	87	83-133	3	25	ug/L	
Chloroform	<0.5000	50.00	50.42	101	48.66	97	81-134	4	25	ug/L	
1,1,1-Trichloroethane	<0.5000	50.00	52.95	106	50.78	102	80-143	4	25	ug/L	
1,2-Dichloroethane	<0.5000	50.00	60.67	121	58.96	118	81-139	3	25	ug/L	
Carbon tetrachloride	<0.5000	50.00	53.13	106	51.43	103	76-144	3	25	ug/L	
Benzene	<0.5000	50.00	45.57	91	44.68	89	77-143	2	25	ug/L	
Dibromomethane	<0.5000	50.00	49.39	99	48.71	97	74-146	2	25	ug/L	
1,2-Dichloropropane	<0.5000	50.00	48.91	98	48.27	97	73-138	1	25	ug/L	
Acrylonitrile	<5.000	50.00	47.48	95	46.85	94	75-128	1	25	ug/L	
Trichloroethene	<0.5000	50.00	44.87	90	43.59	87	73-148	3	25	ug/L	
Carbon Disulfide	<5.000	50.00	42.19	84	41.37	83	73-148	1	25	ug/L	
Bromodichloromethane	<0.5000	50.00	51.86	104	50.35	101	75-142	3	25	ug/L	
cis-1,3-Dichloropropene	<0.5000	50.00	47.74	95	46.44	93	64-149	2	25	ug/L	
4-Methyl-2-Pentanone (MIBK)	<2.500	50.00	51.05	102	51.71	103	61-125	1	25	ug/L	
trans-1,3-Dichloropropene	<0.5000	50.00	49.25	99	47.81	96	67-135	3	25	ug/L	
1,1,2-Trichloroethane	<0.5000	50.00	46.47	93	46.03	92	68-154	1	25	ug/L	
Toluene	<0.5000	50.00	44.25	89	42.99	86	68-152	3	25	ug/L	
2-Hexanone (MBK)	<2.500	50.00	47.41	95	47.78	96	43-147	1	25	ug/L	
Dibromochloromethane	<0.5000	50.00	46.62	93	46.06	92	81-137	1	25	ug/L	
1,1,1,2-Tetrachloroethane	<0.5000	50.00	46.15	92	45.54	91	73-148	1	25	ug/L	
Bromoform	<2.500	50.00	39.67	79	39.39	79	74-131	0	25	ug/L	
trans-1,4-dichloro-2-butene	<2.500	50.00	57.33	115	55.80	112	53-131	3	25	ug/L	
Tetrachloroethene	<0.5000	50.00	41.82	84	40.51	81	55-166	4	25	ug/L	
Chlorobenzene	<0.5000	50.00	44.69	89	43.21	86	73-150	3	25	ug/L	
Ethylbenzene	<0.5000	50.00	48.38	97	46.05	92	68-151	5	25	ug/L	
m&p-Xylene	<1.000	100	90.69	91	87.27	87	70-138	4	25	ug/L	
Styrene	<0.5000	50.00	45.85	92	44.08	88	72-135	4	25	ug/L	
1,1,2,2-Tetrachloroethane	<0.5000	50.00	51.30	103	49.98	100	70-150	3	25	ug/L	
o-Xylene	<0.5000	50.00	46.36	93	44.39	89	71-139	4	25	ug/L	
1,2,3-Trichloropropane	<0.5000	50.00	51.97	104	51.33	103	69-141	1	25	ug/L	
1,4-Dichlorobenzene	<0.5000	50.00	44.89	90	42.25	85	64-150	6	25	ug/L	
1,2-Dichlorobenzene	<0.5000	50.00	44.97	90	42.34	85	66-146	6	25	ug/L	
Iodomethane	<10.00	50.00	31.63	63	39.46	79	21-135	23	25	ug/L	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units
4-Bromofluorobenzene	111	*	109		87-109	%
Dibromofluoromethane	107		107		93-111	%

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QC Summary

Project Name Dulin Landfill
PSS Project No.: 19082703

Analytical Method: SW-846 8260 B

Seq Number: 167200 | Matrix: Ground Water | Prep Method: SW5030B
Parent Sample Id: 19082703-005 | MS Sample Id: 19082703-005 S | Date Prep: 08/28/19
MSD Sample Id: 19082703-005 SD

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units
Toluene-D8	102		102		91-109	%

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

19082703

(1) *CLIENT: Earth Data Inc. *OFFICE LOC. Centreville, MD
*PROJECT MGR: JP Stokes *PHONE NO.: (410) 758 8160
EMAIL: JPStokes@earthdatainc.com FAX NO.: (410) 758 8108
*PROJECT NAME: Dulin Landfill PROJECT NO.: 4697E
SITE LOCATION: Kent County MD, Chestertown P.O. NO.:
SAMPLER(S): J. Chapman DW CERT NO.:

PSS Work Order #: ~~19022602~~ PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C=COMP G=GRAB
1	MW1	8/26/19	1300	GW	13	G
2	MW2	8/26/19	1205	GW	13	G
3	MW3	8/26/19	1155	GW	13	G
4	MW4	8/26/19	1115	GW	13	G
5	MW5	8/26/19	1035	GW	13	G

Preservatives Used: HNO3 | H2SO4 | H2SO4 | — | — | — | — | HCL | HCL

Analysis/Method Required (3) *:
- 22 Total Metals 2008 + hardness
- COD
- Nitrogen Ammonia
- Alkalinity - low level
- TDS
- conductivity; pH Nitrate, Cl, Sulfate
- Turbidity
- VOC 8260
- VOC 8011 EDB/DBCP

REMARKS

(5)

Relinquished By:	Date	Time	Received By:
(1)	8/27/19	0715	
(2)	8/27/19	0845	Bob Welch
(3)			
(4)			

(4)

*Requested TAT (One TAT per COC): ☒ 5-Day ☐ 3-Day ☐ 2-Day ☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required: COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE: Excel, PDF, txt

STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER

# of Coolers: 1
Custody Seal: Abs
Ice Present: Pres Temp: 1.8-4.9c
Shipping Carrier: TTE

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Sample Receipt Checklist

Project Name: Dulin Landfill
PSS Project No.: 19082703

Client Name Earth Data, Inc
Disposal Date 10/01/2019

Received By Barb Weber
Date Received 08/27/2019 08:45:00 AM
Delivered By Trans Time Express
Tracking No Not Applicable
Logged In By Thomas Wingate

Shipping Container(s)
No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	4.9
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Jeff Chipman
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Holding Time

		Total No. of Samples Received	5
All Samples Received Within Holding Time(s)?	No	Total No. of Containers Received	65

Preservation

Total Metals	(pH<2)	Yes
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	Yes
TOX, TKN, NH3, Total Phos	(pH<2)	Yes
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	Yes
Do VOA vials have zero headspace?		Yes
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

PHASE SEPARATION SCIENCE

6630 Baltimore National Pike
Baltimore, MD 21228
410-747-8770
800-932-9047
www.phaseonline.com

Sample Receipt Checklist

Project Name: Dulin Landfill
PSS Project No.: 19082703

Client Name	Earth Data, Inc	**Received By**	Barb Weber
Disposal Date	10/01/2019	**Date Received**	08/27/2019 08:45:00 AM
		Delivered By	Trans Time Express
		Tracking No	Not Applicable
		Logged In By	Thomas Wingate

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Samples Inspected/Checklist Completed By: Thomas Wingate — Date: 08/27/2019

PM Review and Approval: Lynn Jackson — Date: 08/27/2019

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-117926-1
Client Project/Site: Dulin Landfill

For:
Earth Data Inc
131 Comet Drive
Centreville, Maryland 21617

Attn: JP Stokes

Authorized for release by:
9/13/2019 3:44:56 PM

Michael DelMonico, Project Manager I
(330)497-9396
michael.delmonico@testamericainc.com

Table of Contents

Definitions/Glossary

Client: Earth Data Inc
Project/Site: Dulin Landfill

Job ID: 240-117926-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC Semi VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.
H	Sample was prepped or analyzed beyond the specified holding time
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 240-117926-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: Earth Data Inc

Project: Dulin Landfill

Report Number: 240-117926-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, Canton attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The sample was received on 8/27/2019 9:40 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.5º C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Sample MW-1 (240-117926-1) was analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260C. The sample was analyzed on 08/30/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS BY MICROEXTRACTION AND GAS CHROMATOGRAPHY

Sample MW-1 (240-117926-1) was analyzed for Volatile Organic Compounds by microextraction and gas chromatography in accordance with EPA SW-846 Method 8011. The sample was prepared and analyzed on 09/03/2019.

1,1,1,2-Tetrachloroethane failed the surrogate recovery criteria high for MW-1 (240-117926-1). Refer to the QC report for details.

Surrogate recovery for the following sample was outside the upper control limit: MW-1 (240-117926-1). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

The continuing calibration verification (CCV) associated with batch 240-398771 recovered above the upper control limit for Ethylene

Job ID: 240-117926-1 (Continued)

Laboratory: Eurofins TestAmerica, Canton (Continued)

Dibromide and 1,1,1,2-Tetrachloroethane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following sample is impacted: MW-1 (240-117926-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL RECOVERABLE METALS (ICPMS)

Sample MW-1 (240-117926-1) was analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The sample was prepared on 08/28/2019 and analyzed on 08/30/2019 and 09/03/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY

Sample MW-1 (240-117926-1) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The sample was prepared and analyzed on 08/28/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TURBIDITY

Sample MW-1 (240-117926-1) was analyzed for turbidity in accordance with EPA Method 180.1. The sample was analyzed on 08/27/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ALKALINITY

Sample MW-1 (240-117926-1) was analyzed for alkalinity in accordance with SM 2320B. The sample was analyzed on 09/04/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

HARDNESS

Sample MW-1 (240-117926-1) was analyzed for hardness in accordance with SM 2340C. The sample was analyzed on 08/30/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CONDUCTIVITY

Sample MW-1 (240-117926-1) was analyzed for conductivity in accordance with SM 2510B. The sample was analyzed on 09/09/2019.

Resistivity was detected in method blank MB 240-399697/31 at a level exceeding the reporting limit. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS

Sample MW-1 (240-117926-1) was analyzed for total dissolved solids in accordance with SM 2540C. The sample was analyzed on 09/03/2019.

Oversight in lab, sample reported outside hold: MW-1 (240-117926-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS

Sample MW-1 (240-117926-1) was analyzed for anions in accordance with EPA Method 300.0. The sample was analyzed on 08/27/2019 and 08/28/2019.

Sample MW-1 (240-117926-1)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Reanalysis of the following sample was performed outside of the analytical holding time due to sample requiring a dilution: MW-1

Job ID: 240-117926-1 (Continued)

Laboratory: Eurofins TestAmerica, Canton (Continued)

(240-117926-1). Both in hold and out of hold data to be reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS

Sample MW-1 (240-117926-1) was analyzed for anions in accordance with EPA Method 300.0. The sample was analyzed on 08/27/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CHEMICAL OXYGEN DEMAND

Sample MW-1 (240-117926-1) was analyzed for chemical oxygen demand in accordance with SM 5220D. The sample was analyzed on 08/29/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PH

Sample MW-1 (240-117926-1) was analyzed for pH in accordance with EPA SW-846 Method 9040C. The sample was analyzed on 08/27/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

AMMONIA

Sample MW-1 (240-117926-1) was analyzed for ammonia in accordance with SM 4500 NH3 D. The sample was analyzed on 09/12/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: Earth Data Inc
Project/Site: Dulin Landfill

Job ID: 240-117926-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL CAN
8011	EDB, DBCP, and 1,2,3-TCP (GC)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
180.1	Turbidity, Nephelometric	MCAWW	TAL CAN
2320B-2011	Alkalinity, Total	SM	TAL CAN
2340C-2011	Hardness, Total	SM	TAL CAN
2510B-2011	Conductivity, Specific Conductance	SM	TAL CAN
2540 C-2011	Total Dissolved Solids (Dried at 180 °C)	SM	TAL CAN
300.0	Anions, Ion Chromatography	MCAWW	TAL CAN
4500 NH3 D-2011	Ammonia	SM	TAL CAN
5220D-2011	Chemical Oxygen Demand	SM	TAL CAN
9040C	pH	SW846	TAL CAN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
5030C	Purge and Trap	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN
8011	Microextraction	SW846	TAL CAN

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: Earth Data Inc
Project/Site: Dulin Landfill

Job ID: 240-117926-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-117926-1	MW-1	Water	08/26/19 13:00	08/27/19 09:40	

Detection Summary

Client: Earth Data Inc
Project/Site: Dulin Landfill

Job ID: 240-117926-1

Client Sample ID: MW-1

Lab Sample ID: 240-117926-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	0.17	J	1.0	0.11	ug/L	1		8260C	Total/NA
Xylenes, Total	0.96	J	2.0	0.15	ug/L	1		8260C	Total/NA
Barium	76		5.0	2.2	ug/L	1		6020A	Total Recoverable
Beryllium	0.53	J	1.0	0.31	ug/L	1		6020A	Total Recoverable
Calcium	14000		1000	580	ug/L	1		6020A	Total Recoverable
Cobalt	0.90	J	1.0	0.19	ug/L	1		6020A	Total Recoverable
Chromium	1.7	J	2.0	0.98	ug/L	1		6020A	Total Recoverable
Iron	130		100	47	ug/L	1		6020A	Total Recoverable
Potassium	3600		1000	220	ug/L	1		6020A	Total Recoverable
Magnesium	5200		1000	200	ug/L	1		6020A	Total Recoverable
Manganese	16		5.0	2.1	ug/L	1		6020A	Total Recoverable
Sodium	10000		1000	330	ug/L	1		6020A	Total Recoverable
Nickel	5.2		2.0	1.5	ug/L	1		6020A	Total Recoverable
Zinc	27		20	15	ug/L	1		6020A	Total Recoverable
Thallium	0.68	J	1.0	0.20	ug/L	1		6020A	Total Recoverable
Turbidity	0.80		0.50	0.16	NTU	1		180.1	Total/NA
Hardness as calcium carbonate	58		5.0	2.4	mg/L	1		2340C-2011	Total/NA
Specific Conductance	210		1.0	0.61	umhos/cm	1		2510B-2011	Total/NA
Resistivity	4800	^	1.0	0.61	ohm cm	1		2510B-2011	Total/NA
Total Dissolved Solids	180	H	10	7.8	mg/L	1		2540 C-2011	Total/NA
Chloride	14		1.0	0.28	mg/L	1		300.0	Total/NA
Nitrate as N	17	E	0.10	0.014	mg/L	1		300.0	Total/NA
pH	5.2	HF	0.1	0.1	SU	1		9040C	Total/NA
Nitrate as N - RA	17	H	0.50	0.070	mg/L	5		300.0	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Earth Data Inc
Project/Site: Dulin Landfill

Job ID: 240-117926-1

Client Sample ID: MW-1

Date Collected: 08/26/19 13:00
Date Received: 08/27/19 09:40

Lab Sample ID: 240-117926-1

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		1.0	0.14	ug/L			08/30/19 16:27	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			08/30/19 16:27	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.13	ug/L			08/30/19 16:27	1
1,1,2-Trichloroethane	ND		1.0	0.090	ug/L			08/30/19 16:27	1
1,1-Dichloroethane	ND		1.0	0.17	ug/L			08/30/19 16:27	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			08/30/19 16:27	1
1,2,3-Trichloropropane	ND		1.0	0.24	ug/L			08/30/19 16:27	1
1,2-Dichlorobenzene	ND		1.0	0.15	ug/L			08/30/19 16:27	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			08/30/19 16:27	1
1,2-Dichloropropane	ND		1.0	0.15	ug/L			08/30/19 16:27	1
1,4-Dichlorobenzene	ND		1.0	0.16	ug/L			08/30/19 16:27	1
2-Butanone (MEK)	ND		10	1.2	ug/L			08/30/19 16:27	1
2-Hexanone	ND		10	0.54	ug/L			08/30/19 16:27	1
4-Methyl-2-pentanone (MIBK)	ND		10	0.42	ug/L			08/30/19 16:27	1
Acetone	ND		10	5.4	ug/L			08/30/19 16:27	1
Acrylonitrile	ND		20	1.1	ug/L			08/30/19 16:27	1
Benzene	ND		1.0	0.13	ug/L			08/30/19 16:27	1
Bromoform	ND		1.0	0.76	ug/L			08/30/19 16:27	1
Bromomethane	ND		1.0	0.42	ug/L			08/30/19 16:27	1
Carbon disulfide	ND		1.0	0.28	ug/L			08/30/19 16:27	1
Carbon tetrachloride	ND		1.0	0.26	ug/L			08/30/19 16:27	1
Chlorobenzene	ND		1.0	0.14	ug/L			08/30/19 16:27	1
Chlorodibromomethane	ND		1.0	0.39	ug/L			08/30/19 16:27	1
Chloroethane	ND		1.0	0.83	ug/L			08/30/19 16:27	1
Chloroform	ND		1.0	0.13	ug/L			08/30/19 16:27	1
Chloromethane	ND		1.0	0.20	ug/L			08/30/19 16:27	1
cis-1,2-Dichloroethene	ND		1.0	0.16	ug/L			08/30/19 16:27	1
cis-1,3-Dichloropropene	ND		1.0	0.61	ug/L			08/30/19 16:27	1
Dibromomethane	ND		1.0	0.090	ug/L			08/30/19 16:27	1
Chlorobromomethane	ND		1.0	0.14	ug/L			08/30/19 16:27	1
Dichlorobromomethane	ND		1.0	0.17	ug/L			08/30/19 16:27	1
Ethylbenzene	**0.17**	**J**	1.0	0.11	ug/L			08/30/19 16:27	1
Iodomethane	ND		1.0	0.23	ug/L			08/30/19 16:27	1
Methyl tert-butyl ether	ND		1.0	0.070	ug/L			08/30/19 16:27	1
Methylene Chloride	ND		5.0	2.6	ug/L			08/30/19 16:27	1
Styrene	ND		1.0	0.10	ug/L			08/30/19 16:27	1
Tetrachloroethene	ND		1.0	0.15	ug/L			08/30/19 16:27	1
Toluene	ND		1.0	0.14	ug/L			08/30/19 16:27	1
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			08/30/19 16:27	1
trans-1,3-Dichloropropene	ND		1.0	0.67	ug/L			08/30/19 16:27	1
trans-1,4-Dichloro-2-butene	ND		2.5	1.3	ug/L			08/30/19 16:27	1
Trichloroethene	ND		1.0	0.10	ug/L			08/30/19 16:27	1
Trichlorofluoromethane	ND		1.0	0.45	ug/L			08/30/19 16:27	1
Vinyl acetate	ND		2.0	0.19	ug/L			08/30/19 16:27	1
Vinyl chloride	ND		1.0	0.20	ug/L			08/30/19 16:27	1
Xylenes, Total	**0.96**	**J**	2.0	0.15	ug/L			08/30/19 16:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*90*		*70 - 123*		*08/30/19 16:27*	*1*
Dibromofluoromethane (Surr)	*99*		*75 - 128*		*08/30/19 16:27*	*1*

Client Sample ID: MW-1

Date Collected: 08/26/19 13:00
Date Received: 08/27/19 09:40

Lab Sample ID: 240-117926-1

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*59 - 120*		*08/30/19 16:27*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 121*		*08/30/19 16:27*	*1*

Method: 8011 - EDB, DBCP, and 1,2,3-TCP (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylene Dibromide	ND		0.020	0.0061	ug/L		09/03/19 08:26	09/03/19 18:14	1
1,2-Dibromo-3-Chloropropane	ND		0.020	0.0031	ug/L		09/03/19 08:26	09/03/19 18:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1,2-Tetrachloroethane	*148*	*X*	*60 - 140*	*09/03/19 08:26*	*09/03/19 18:14*	*1*

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.053	ug/L		08/28/19 14:00	08/30/19 20:01	1
Arsenic	ND		5.0	0.75	ug/L		08/28/19 14:00	08/30/19 20:01	1
Barium	**76**		5.0	2.2	ug/L		08/28/19 14:00	08/30/19 20:01	1
Beryllium	**0.53**	**J**	1.0	0.31	ug/L		08/28/19 14:00	09/03/19 17:36	1
Calcium	**14000**		1000	580	ug/L		08/28/19 14:00	08/30/19 20:01	1
Cadmium	ND		1.0	0.20	ug/L		08/28/19 14:00	08/30/19 20:01	1
Cobalt	**0.90**	**J**	1.0	0.19	ug/L		08/28/19 14:00	08/30/19 20:01	1
Chromium	**1.7**	**J**	2.0	0.98	ug/L		08/28/19 14:00	08/30/19 20:01	1
Copper	ND		2.0	1.7	ug/L		08/28/19 14:00	08/30/19 20:01	1
Iron	**130**		100	47	ug/L		08/28/19 14:00	08/30/19 20:01	1
Potassium	**3600**		1000	220	ug/L		08/28/19 14:00	08/30/19 20:01	1
Magnesium	**5200**		1000	200	ug/L		08/28/19 14:00	08/30/19 20:01	1
Manganese	**16**		5.0	2.1	ug/L		08/28/19 14:00	08/30/19 20:01	1
Sodium	**10000**		1000	330	ug/L		08/28/19 14:00	08/30/19 20:01	1
Nickel	**5.2**		2.0	1.5	ug/L		08/28/19 14:00	08/30/19 20:01	1
Lead	ND		1.0	0.45	ug/L		08/28/19 14:00	08/30/19 20:01	1
Selenium	ND		5.0	0.89	ug/L		08/28/19 14:00	08/30/19 20:01	1
Vanadium	ND		5.0	0.82	ug/L		08/28/19 14:00	08/30/19 20:01	1
Zinc	**27**		20	15	ug/L		08/28/19 14:00	08/30/19 20:01	1
Antimony	ND		2.0	0.57	ug/L		08/28/19 14:00	08/30/19 20:01	1
Thallium	**0.68**	**J**	1.0	0.20	ug/L		08/28/19 14:00	08/30/19 20:01	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/28/19 12:00	08/28/19 16:20	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Turbidity	**0.80**		0.50	0.16	NTU			08/27/19 16:27	1
Alkalinity	ND		5.0	2.6	mg/L			09/04/19 22:15	1
Hardness as calcium carbonate	**58**		5.0	2.4	mg/L			08/30/19 10:50	1
Specific Conductance	**210**		1.0	0.61	umhos/cm			09/09/19 09:54	1
Resistivity	**4800**	**^**	1.0	0.61	ohm cm			09/09/19 09:54	1
Total Dissolved Solids	**180**	**H**	10	7.8	mg/L			09/03/19 10:10	1
Chloride	**14**		1.0	0.28	mg/L			08/27/19 17:43	1
Nitrate as N	**17**	**E**	0.10	0.014	mg/L			08/27/19 17:43	1
Sulfate	ND		1.0	0.35	mg/L			08/27/19 17:43	1

Client: Earth Data Inc
Project/Site: Dulin Landfill

Job ID: 240-117926-1

Client Sample ID: MW-1

Date Collected: 08/26/19 13:00
Date Received: 08/27/19 09:40

Lab Sample ID: 240-117926-1

Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.093	mg/L			09/12/19 14:48	1
Chemical Oxygen Demand	ND		10	4.1	mg/L			08/29/19 13:59	1
pH	**5.2**	**HF**	0.1	0.1	SU			08/27/19 15:18	1

General Chemistry - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	**17**	**H**	0.50	0.070	mg/L			08/28/19 22:19	5

Surrogate Summary

Client: Earth Data Inc
Project/Site: Dulin Landfill

Job ID: 240-117926-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	TOL (70-123)	DBFM (75-128)	BFB (59-120)	DCA (70-121)
240-117926-1	MW-1	90	99	97	94
LCS 240-398467/5	Lab Control Sample	97	106	101	102
LCSD 240-398467/6	Lab Control Sample Dup	95	103	98	97
MB 240-398467/9	Method Blank	89	102	91	99

Surrogate Legend

TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8011 - EDB, DBCP, and 1,2,3-TCP (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	TCEA1 (60-140)
240-117926-1	MW-1	148 X
LCS 240-398730/2-A	Lab Control Sample	129
MB 240-398730/1-A	Method Blank	138

Surrogate Legend

TCEA = 1,1,1,2-Tetrachloroethane

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 240-398467/9
Matrix: Water
Analysis Batch: 398467

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		1.0	0.14	ug/L			08/30/19 12:20	1
1,1,1-Trichloroethane	ND		1.0	0.24	ug/L			08/30/19 12:20	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.13	ug/L			08/30/19 12:20	1
1,1,2-Trichloroethane	ND		1.0	0.090	ug/L			08/30/19 12:20	1
1,1-Dichloroethane	ND		1.0	0.17	ug/L			08/30/19 12:20	1
1,1-Dichloroethene	ND		1.0	0.19	ug/L			08/30/19 12:20	1
1,2,3-Trichloropropane	ND		1.0	0.24	ug/L			08/30/19 12:20	1
1,2-Dichlorobenzene	ND		1.0	0.15	ug/L			08/30/19 12:20	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			08/30/19 12:20	1
1,2-Dichloropropane	ND		1.0	0.15	ug/L			08/30/19 12:20	1
1,4-Dichlorobenzene	ND		1.0	0.16	ug/L			08/30/19 12:20	1
2-Butanone (MEK)	ND		10	1.2	ug/L			08/30/19 12:20	1
2-Hexanone	ND		10	0.54	ug/L			08/30/19 12:20	1
4-Methyl-2-pentanone (MIBK)	ND		10	0.42	ug/L			08/30/19 12:20	1
Acetone	ND		10	5.4	ug/L			08/30/19 12:20	1
Acrylonitrile	ND		20	1.1	ug/L			08/30/19 12:20	1
Benzene	ND		1.0	0.13	ug/L			08/30/19 12:20	1
Bromoform	ND		1.0	0.76	ug/L			08/30/19 12:20	1
Bromomethane	ND		1.0	0.42	ug/L			08/30/19 12:20	1
Carbon disulfide	ND		1.0	0.28	ug/L			08/30/19 12:20	1
Carbon tetrachloride	ND		1.0	0.26	ug/L			08/30/19 12:20	1
Chlorobenzene	ND		1.0	0.14	ug/L			08/30/19 12:20	1
Chlorodibromomethane	ND		1.0	0.39	ug/L			08/30/19 12:20	1
Chloroethane	ND		1.0	0.83	ug/L			08/30/19 12:20	1
Chloroform	ND		1.0	0.13	ug/L			08/30/19 12:20	1
Chloromethane	ND		1.0	0.20	ug/L			08/30/19 12:20	1
cis-1,2-Dichloroethene	ND		1.0	0.16	ug/L			08/30/19 12:20	1
cis-1,3-Dichloropropene	ND		1.0	0.61	ug/L			08/30/19 12:20	1
Dibromomethane	ND		1.0	0.090	ug/L			08/30/19 12:20	1
Chlorobromomethane	ND		1.0	0.14	ug/L			08/30/19 12:20	1
Dichlorobromomethane	ND		1.0	0.17	ug/L			08/30/19 12:20	1
Ethylbenzene	ND		1.0	0.11	ug/L			08/30/19 12:20	1
Iodomethane	ND		1.0	0.23	ug/L			08/30/19 12:20	1
Methyl tert-butyl ether	ND		1.0	0.070	ug/L			08/30/19 12:20	1
Methylene Chloride	ND		5.0	2.6	ug/L			08/30/19 12:20	1
Styrene	ND		1.0	0.10	ug/L			08/30/19 12:20	1
Tetrachloroethene	ND		1.0	0.15	ug/L			08/30/19 12:20	1
Toluene	ND		1.0	0.14	ug/L			08/30/19 12:20	1
trans-1,2-Dichloroethene	ND		1.0	0.19	ug/L			08/30/19 12:20	1
trans-1,3-Dichloropropene	ND		1.0	0.67	ug/L			08/30/19 12:20	1
trans-1,4-Dichloro-2-butene	ND		2.5	1.3	ug/L			08/30/19 12:20	1
Trichloroethene	ND		1.0	0.10	ug/L			08/30/19 12:20	1
Trichlorofluoromethane	ND		1.0	0.45	ug/L			08/30/19 12:20	1
Vinyl acetate	ND		2.0	0.19	ug/L			08/30/19 12:20	1
Vinyl chloride	ND		1.0	0.20	ug/L			08/30/19 12:20	1
Xylenes, Total	ND		2.0	0.15	ug/L			08/30/19 12:20	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 240-398467/9
Matrix: Water
Analysis Batch: 398467

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	*89*		*70 - 123*		*08/30/19 12:20*	*1*
Dibromofluoromethane (Surr)	*102*		*75 - 128*		*08/30/19 12:20*	*1*
4-Bromofluorobenzene (Surr)	*91*		*59 - 120*		*08/30/19 12:20*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 121*		*08/30/19 12:20*	*1*

Lab Sample ID: LCS 240-398467/5
Matrix: Water
Analysis Batch: 398467

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	20.0	19.4		ug/L		97	80 - 124
1,1,1-Trichloroethane	20.0	22.2		ug/L		111	69 - 134
1,1,2,2-Tetrachloroethane	20.0	18.9		ug/L		95	65 - 139
1,1,2-Trichloroethane	20.0	19.8		ug/L		99	78 - 133
1,1-Dichloroethane	20.0	21.2		ug/L		106	75 - 133
1,1-Dichloroethene	20.0	22.2		ug/L		111	65 - 139
1,2,3-Trichloropropane	20.0	19.5		ug/L		97	66 - 139
1,2-Dichlorobenzene	20.0	19.0		ug/L		95	78 - 120
1,2-Dichloroethane	20.0	21.8		ug/L		109	71 - 135
1,2-Dichloropropane	20.0	22.7		ug/L		114	78 - 133
1,4-Dichlorobenzene	20.0	19.4		ug/L		97	78 - 120
2-Butanone (MEK)	40.0	44.6		ug/L		112	39 - 163
2-Hexanone	40.0	38.5		ug/L		96	43 - 148
4-Methyl-2-pentanone (MIBK)	40.0	44.3		ug/L		111	49 - 143
Acetone	40.0	45.4		ug/L		113	21 - 162
Acrylonitrile	200	223		ug/L		112	54 - 152
Benzene	20.0	21.9		ug/L		110	80 - 123
Bromoform	20.0	20.8		ug/L		104	49 - 141
Bromomethane	20.0	20.8		ug/L		104	41 - 175
Carbon disulfide	20.0	19.8		ug/L		99	60 - 138
Carbon tetrachloride	20.0	21.9		ug/L		110	63 - 140
Chlorobenzene	20.0	20.2		ug/L		101	80 - 121
Chlorodibromomethane	20.0	20.3		ug/L		101	70 - 132
Chloroethane	20.0	20.9		ug/L		104	33 - 173
Chloroform	20.0	21.5		ug/L		107	79 - 127
Chloromethane	20.0	18.1		ug/L		91	54 - 143
cis-1,2-Dichloroethene	20.0	22.0		ug/L		110	76 - 128
cis-1,3-Dichloropropene	20.0	22.7		ug/L		113	64 - 132
Dibromomethane	20.0	24.8		ug/L		124	74 - 124
Chlorobromomethane	20.0	20.4		ug/L		102	74 - 130
Dichlorobromomethane	20.0	22.9		ug/L		114	77 - 125
Ethylbenzene	20.0	20.0		ug/L		100	80 - 120
Iodomethane	20.0	21.8		ug/L		109	59 - 147
Methyl tert-butyl ether	20.0	20.7		ug/L		103	51 - 133
Methylene Chloride	20.0	20.2		ug/L		101	70 - 134
Styrene	20.0	20.6		ug/L		103	79 - 120
Tetrachloroethene	20.0	21.0		ug/L		105	74 - 130
Toluene	20.0	19.6		ug/L		98	78 - 129

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 240-398467/5
Matrix: Water
Analysis Batch: 398467

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
trans-1,2-Dichloroethene	20.0	21.4		ug/L		107	78 - 133
trans-1,3-Dichloropropene	20.0	18.9		ug/L		95	55 - 128
trans-1,4-Dichloro-2-butene	20.0	17.8		ug/L		89	16 - 181
Trichloroethene	20.0	22.4		ug/L		112	76 - 125
Trichlorofluoromethane	20.0	23.7		ug/L		119	51 - 164
Vinyl acetate	20.0	23.9		ug/L		119	45 - 151
Vinyl chloride	20.0	19.6		ug/L		98	58 - 143
Xylenes, Total	40.0	40.3		ug/L		101	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*97*		*70 - 123*
Dibromofluoromethane (Surr)	*106*		*75 - 128*
4-Bromofluorobenzene (Surr)	*101*		*59 - 120*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 121*

Lab Sample ID: LCSD 240-398467/6
Matrix: Water
Analysis Batch: 398467

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1,2-Tetrachloroethane	20.0	18.4		ug/L		92	80 - 124	6	35
1,1,1-Trichloroethane	20.0	21.1		ug/L		105	69 - 134	5	35
1,1,2,2-Tetrachloroethane	20.0	17.2		ug/L		86	65 - 139	10	35
1,1,2-Trichloroethane	20.0	18.0		ug/L		90	78 - 133	9	35
1,1-Dichloroethane	20.0	19.6		ug/L		98	75 - 133	8	35
1,1-Dichloroethene	20.0	20.6		ug/L		103	65 - 139	7	35
1,2,3-Trichloropropane	20.0	17.4		ug/L		87	66 - 139	11	35
1,2-Dichlorobenzene	20.0	18.0		ug/L		90	78 - 120	5	35
1,2-Dichloroethane	20.0	20.1		ug/L		101	71 - 135	8	35
1,2-Dichloropropane	20.0	20.2		ug/L		101	78 - 133	12	35
1,4-Dichlorobenzene	20.0	18.0		ug/L		90	78 - 120	7	35
2-Butanone (MEK)	40.0	38.5		ug/L		96	39 - 163	15	35
2-Hexanone	40.0	35.3		ug/L		88	43 - 148	9	35
4-Methyl-2-pentanone (MIBK)	40.0	38.4		ug/L		96	49 - 143	14	35
Acetone	40.0	36.5		ug/L		91	21 - 162	22	35
Acrylonitrile	200	193		ug/L		96	54 - 152	15	35
Benzene	20.0	19.9		ug/L		100	80 - 123	10	35
Bromoform	20.0	19.0		ug/L		95	49 - 141	9	35
Bromomethane	20.0	19.7		ug/L		99	41 - 175	5	35
Carbon disulfide	20.0	18.8		ug/L		94	60 - 138	5	35
Carbon tetrachloride	20.0	20.6		ug/L		103	63 - 140	6	35
Chlorobenzene	20.0	18.7		ug/L		93	80 - 121	8	35
Chlorodibromomethane	20.0	18.7		ug/L		94	70 - 132	8	35
Chloroethane	20.0	19.9		ug/L		99	33 - 173	5	35
Chloroform	20.0	20.0		ug/L		100	79 - 127	7	35
Chloromethane	20.0	17.7		ug/L		88	54 - 143	3	35
cis-1,2-Dichloroethene	20.0	20.4		ug/L		102	76 - 128	8	35
cis-1,3-Dichloropropene	20.0	19.9		ug/L		100	64 - 132	13	35

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 240-398467/6
Matrix: Water
Analysis Batch: 398467

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dibromomethane			20.0	22.3		ug/L		111	74 - 124	11	35
Chlorobromomethane			20.0	18.6		ug/L		93	74 - 130	9	35
Dichlorobromomethane			20.0	20.8		ug/L		104	77 - 125	10	35
Ethylbenzene			20.0	18.6		ug/L		93	80 - 120	7	35
Iodomethane			20.0	20.5		ug/L		103	59 - 147	6	35
Methyl tert-butyl ether			20.0	19.5		ug/L		97	51 - 133	6	35
Methylene Chloride			20.0	18.9		ug/L		94	70 - 134	7	35
Styrene			20.0	19.0		ug/L		95	79 - 120	8	35
Tetrachloroethene			20.0	20.0		ug/L		100	74 - 130	5	35
Toluene			20.0	18.2		ug/L		91	78 - 129	7	35
trans-1,2-Dichloroethene			20.0	19.9		ug/L		100	78 - 133	7	35
trans-1,3-Dichloropropene			20.0	16.9		ug/L		84	55 - 128	11	35
trans-1,4-Dichloro-2-butene			20.0	16.0		ug/L		80	16 - 181	11	35
Trichloroethene			20.0	20.6		ug/L		103	76 - 125	8	35
Trichlorofluoromethane			20.0	21.8		ug/L		109	51 - 164	8	35
Vinyl acetate			20.0	21.1		ug/L		106	45 - 151	12	35
Vinyl chloride			20.0	18.5		ug/L		92	58 - 143	6	35
Xylenes, Total			40.0	37.5		ug/L		94	80 - 120	7	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*95*		*70 - 123*
Dibromofluoromethane (Surr)	*103*		*75 - 128*
4-Bromofluorobenzene (Surr)	*98*		*59 - 120*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 121*

Method: 8011 - EDB, DBCP, and 1,2,3-TCP (GC)

Lab Sample ID: MB 240-398730/1-A
Matrix: Water
Analysis Batch: 398771

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 398730

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylene Dibromide	ND		0.020	0.0060	ug/L		09/03/19 08:25	09/03/19 12:27	1
1,2-Dibromo-3-Chloropropane	ND		0.020	0.0030	ug/L		09/03/19 08:25	09/03/19 12:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1,2-Tetrachloroethane	*138*		*60 - 140*	*09/03/19 08:25*	*09/03/19 12:27*	*1*

Lab Sample ID: LCS 240-398730/2-A
Matrix: Water
Analysis Batch: 398771

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 398730

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethylene Dibromide			0.100	0.136		ug/L		136	60 - 140
1,2-Dibromo-3-Chloropropane			0.100	0.122		ug/L		122	60 - 140

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,1,1,2-Tetrachloroethane	*129*		*60 - 140*

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-398034/1-A
Matrix: Water
Analysis Batch: 398747

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 398034

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.053	ug/L		08/28/19 14:00	08/30/19 19:46	1
Arsenic	ND		5.0	0.75	ug/L		08/28/19 14:00	08/30/19 19:46	1
Barium	ND		5.0	2.2	ug/L		08/28/19 14:00	08/30/19 19:46	1
Calcium	ND		1000	580	ug/L		08/28/19 14:00	08/30/19 19:46	1
Cadmium	ND		1.0	0.20	ug/L		08/28/19 14:00	08/30/19 19:46	1
Cobalt	ND		1.0	0.19	ug/L		08/28/19 14:00	08/30/19 19:46	1
Chromium	ND		2.0	0.98	ug/L		08/28/19 14:00	08/30/19 19:46	1
Copper	ND		2.0	1.7	ug/L		08/28/19 14:00	08/30/19 19:46	1
Iron	ND		100	47	ug/L		08/28/19 14:00	08/30/19 19:46	1
Potassium	ND		1000	220	ug/L		08/28/19 14:00	08/30/19 19:46	1
Magnesium	ND		1000	200	ug/L		08/28/19 14:00	08/30/19 19:46	1
Manganese	ND		5.0	2.1	ug/L		08/28/19 14:00	08/30/19 19:46	1
Sodium	ND		1000	330	ug/L		08/28/19 14:00	08/30/19 19:46	1
Nickel	ND		2.0	1.5	ug/L		08/28/19 14:00	08/30/19 19:46	1
Lead	ND		1.0	0.45	ug/L		08/28/19 14:00	08/30/19 19:46	1
Selenium	ND		5.0	0.89	ug/L		08/28/19 14:00	08/30/19 19:46	1
Vanadium	ND		5.0	0.82	ug/L		08/28/19 14:00	08/30/19 19:46	1
Zinc	ND		20	15	ug/L		08/28/19 14:00	08/30/19 19:46	1
Antimony	ND		2.0	0.57	ug/L		08/28/19 14:00	08/30/19 19:46	1
Thallium	ND		1.0	0.20	ug/L		08/28/19 14:00	08/30/19 19:46	1

Lab Sample ID: MB 240-398034/1-A
Matrix: Water
Analysis Batch: 398883

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 398034

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		1.0	0.31	ug/L		08/28/19 14:00	09/03/19 17:17	1

Lab Sample ID: LCS 240-398034/3-A
Matrix: Water
Analysis Batch: 398747

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 398034

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	100	97.7		ug/L		98	80 - 120
Arsenic	1000	1110		ug/L		111	80 - 120
Barium	1000	1040		ug/L		104	80 - 120
Calcium	25000	25800		ug/L		103	80 - 120
Cadmium	500	432		ug/L		86	80 - 120
Cobalt	500	493		ug/L		99	80 - 120
Chromium	500	484		ug/L		97	80 - 120
Copper	500	492		ug/L		98	80 - 120
Iron	5000	4590		ug/L		92	80 - 120
Potassium	25000	24000		ug/L		96	80 - 120
Magnesium	25000	23000		ug/L		92	80 - 120
Manganese	500	465		ug/L		93	80 - 120
Sodium	25000	22000		ug/L		88	80 - 120
Nickel	500	498		ug/L		100	80 - 120
Lead	500	538		ug/L		108	80 - 120
Selenium	1000	917		ug/L		92	80 - 120

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 240-398034/3-A
Matrix: Water
Analysis Batch: 398747

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 398034

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Vanadium	500	495		ug/L		99	80 - 120
Zinc	500	497		ug/L		99	80 - 120
Antimony	100	96.2		ug/L		96	80 - 120
Thallium	1000	1010		ug/L		101	80 - 120

Lab Sample ID: LCS 240-398034/3-A
Matrix: Water
Analysis Batch: 398883

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 398034

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Beryllium	500	515		ug/L		103	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-398040/1-A
Matrix: Water
Analysis Batch: 398222

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 398040

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/28/19 12:00	08/28/19 15:44	1

Lab Sample ID: LCS 240-398040/2-A
Matrix: Water
Analysis Batch: 398222

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 398040

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.80		ug/L		96	80 - 120

Method: 180.1 - Turbidity, Nephelometric

Lab Sample ID: MB 240-397935/3
Matrix: Water
Analysis Batch: 397935

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Turbidity	ND		0.50	0.16	NTU			08/27/19 16:23	1

Lab Sample ID: HLCS 240-397935/6
Matrix: Water
Analysis Batch: 397935

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Turbidity	572	556		NTU		97	75 - 125

Lab Sample ID: LCS 240-397935/5
Matrix: Water
Analysis Batch: 397935

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Turbidity	52.2	49.9		NTU		96	75 - 125

Method: 180.1 - Turbidity, Nephelometric (Continued)

Lab Sample ID: LLCS 240-397935/4
Matrix: Water
Analysis Batch: 397935

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Turbidity	5.97	5.72		NTU		96	75 - 125

Lab Sample ID: 240-117926-1 DU
Matrix: Water
Analysis Batch: 397935

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Turbidity	0.80		0.720		NTU		11	20

Method: 2320B-2011 - Alkalinity, Total

Lab Sample ID: MB 240-399437/30
Matrix: Water
Analysis Batch: 399437

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	ND		5.0	2.6	mg/L			09/04/19 21:06	1

Lab Sample ID: LCS 240-399437/29
Matrix: Water
Analysis Batch: 399437

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	161	154		mg/L		96	86 - 123

Method: 2340C-2011 - Hardness, Total

Lab Sample ID: MB 240-398524/1
Matrix: Water
Analysis Batch: 398524

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	ND		5.0	2.4	mg/L			08/30/19 10:00	1

Lab Sample ID: LCS 240-398524/2
Matrix: Water
Analysis Batch: 398524

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hardness as calcium carbonate	383	376		mg/L		98	90 - 110

Lab Sample ID: 240-117926-1 MS
Matrix: Water
Analysis Batch: 398524

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Hardness as calcium carbonate	58		200	260		mg/L		101	80 - 120

Method: 2340C-2011 - Hardness, Total (Continued)

Lab Sample ID: 240-117926-1 MSD
Matrix: Water
Analysis Batch: 398524

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hardness as calcium carbonate	58		200	260		mg/L		101	80 - 120	0	10

Method: 2510B-2011 - Conductivity, Specific Conductance

Lab Sample ID: MB 240-399697/31
Matrix: Water
Analysis Batch: 399697

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	0.61	umhos/cm			09/09/19 09:54	1
Resistivity	2780000		1.0	0.61	ohm cm			09/09/19 09:54	1

Lab Sample ID: LCS 240-399697/32
Matrix: Water
Analysis Batch: 399697

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	1410	1410		umhos/cm		100	87 - 116

Lab Sample ID: 240-117926-1 DU
Matrix: Water
Analysis Batch: 399697

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	210		209		umhos/cm			20
Resistivity	4800	^	4790		ohm cm		NC	20

Method: 2540 C-2011 - Total Dissolved Solids (Dried at 180 °C)

Lab Sample ID: MB 240-398758/1
Matrix: Water
Analysis Batch: 398758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	7.8	mg/L			09/03/19 10:10	1

Lab Sample ID: LCS 240-398758/2
Matrix: Water
Analysis Batch: 398758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	511	526		mg/L		103	80 - 120

Lab Sample ID: 240-117926-1 DU
Matrix: Water
Analysis Batch: 398758

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	180	H	157		mg/L		16	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 240-397920/3
Matrix: Water
Analysis Batch: 397920

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.28	mg/L			08/27/19 15:23	1
Sulfate	ND		1.0	0.35	mg/L			08/27/19 15:23	1

Lab Sample ID: LCS 240-397920/4
Matrix: Water
Analysis Batch: 397920

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	49.6		mg/L		99	90 - 110
Sulfate	50.0	51.1		mg/L		102	90 - 110

Lab Sample ID: 240-117926-1 MS
Matrix: Water
Analysis Batch: 397920

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	14		50.0	67.0		mg/L		105	80 - 120
Sulfate	ND		50.0	52.4		mg/L		105	80 - 120

Lab Sample ID: 240-117926-1 MSD
Matrix: Water
Analysis Batch: 397920

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	14		50.0	67.2		mg/L		106	80 - 120	0	15
Sulfate	ND		50.0	53.0		mg/L		106	80 - 120	1	15

Lab Sample ID: MB 240-397921/3
Matrix: Water
Analysis Batch: 397921

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.10	0.014	mg/L			08/27/19 15:23	1

Lab Sample ID: LCS 240-397921/4
Matrix: Water
Analysis Batch: 397921

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.50	2.61		mg/L		105	90 - 110

Lab Sample ID: 240-117926-1 MS
Matrix: Water
Analysis Batch: 397921

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	17	E	2.50	19.5	E 4	mg/L		82	80 - 120

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 240-117926-1 MSD
Matrix: Water
Analysis Batch: 397921

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	17	E	2.50	19.6	E 4	mg/L		84	80 - 120	0	15

Lab Sample ID: MB 240-398091/3
Matrix: Water
Analysis Batch: 398091

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.28	mg/L			08/28/19 12:15	1
Sulfate	ND		1.0	0.35	mg/L			08/28/19 12:15	1

Lab Sample ID: LCS 240-398091/4
Matrix: Water
Analysis Batch: 398091

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.0		mg/L		100	90 - 110
Sulfate	50.0	51.4		mg/L		103	90 - 110

Lab Sample ID: MB 240-398092/3
Matrix: Water
Analysis Batch: 398092

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.10	0.014	mg/L			08/28/19 12:15	1

Lab Sample ID: LCS 240-398092/4
Matrix: Water
Analysis Batch: 398092

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.50	2.64		mg/L		105	90 - 110

Method: 4500 NH3 D-2011 - Ammonia

Lab Sample ID: MB 240-400424/7
Matrix: Water
Analysis Batch: 400424

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.093	mg/L			09/12/19 14:33	1

Lab Sample ID: LCS 240-400424/8
Matrix: Water
Analysis Batch: 400424

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	15.2	13.2		mg/L		87	85 - 114

Client: Earth Data Inc
Project/Site: Dulin Landfill

Job ID: 240-117926-1

Method: 5220D-2011 - Chemical Oxygen Demand

Lab Sample ID: MB 240-398283/9
Matrix: Water
Analysis Batch: 398283

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	ND		10	4.1	mg/L			08/29/19 13:38	1

Lab Sample ID: LCS 240-398283/10
Matrix: Water
Analysis Batch: 398283

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chemical Oxygen Demand			68.4	69.1		mg/L		101	90 - 110		

Method: 9040C - pH

Lab Sample ID: LCS 240-397925/2
Matrix: Water
Analysis Batch: 397925

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			5.31	5.4		SU		101	97 - 103		

Lab Sample ID: 240-117926-1 DU
Matrix: Water
Analysis Batch: 397925

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	5.2	HF		5.1		SU				0.2	20

QC Association Summary

Client: Earth Data Inc
Project/Site: Dulin Landfill

Job ID: 240-117926-1

GC/MS VOA

Analysis Batch: 398467

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	8260C	
MB 240-398467/9	Method Blank	Total/NA	Water	8260C	
LCS 240-398467/5	Lab Control Sample	Total/NA	Water	8260C	
LCSD 240-398467/6	Lab Control Sample Dup	Total/NA	Water	8260C	

GC Semi VOA

Prep Batch: 398730

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	8011	
MB 240-398730/1-A	Method Blank	Total/NA	Water	8011	
LCS 240-398730/2-A	Lab Control Sample	Total/NA	Water	8011	

Analysis Batch: 398771

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	8011	398730
MB 240-398730/1-A	Method Blank	Total/NA	Water	8011	398730
LCS 240-398730/2-A	Lab Control Sample	Total/NA	Water	8011	398730

Metals

Prep Batch: 398034

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total Recoverable	Water	3005A	
MB 240-398034/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-398034/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 398040

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	7470A	
MB 240-398040/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-398040/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 398222

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	7470A	398040
MB 240-398040/1-A	Method Blank	Total/NA	Water	7470A	398040
LCS 240-398040/2-A	Lab Control Sample	Total/NA	Water	7470A	398040

Analysis Batch: 398747

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total Recoverable	Water	6020A	398034
MB 240-398034/1-A	Method Blank	Total Recoverable	Water	6020A	398034
LCS 240-398034/3-A	Lab Control Sample	Total Recoverable	Water	6020A	398034

Analysis Batch: 398883

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total Recoverable	Water	6020A	398034
MB 240-398034/1-A	Method Blank	Total Recoverable	Water	6020A	398034
LCS 240-398034/3-A	Lab Control Sample	Total Recoverable	Water	6020A	398034

General Chemistry

Analysis Batch: 397920

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	300.0	
MB 240-397920/3	Method Blank	Total/NA	Water	300.0	
LCS 240-397920/4	Lab Control Sample	Total/NA	Water	300.0	
240-117926-1 MS	MW-1	Total/NA	Water	300.0	
240-117926-1 MSD	MW-1	Total/NA	Water	300.0	

Analysis Batch: 397921

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	300.0	
MB 240-397921/3	Method Blank	Total/NA	Water	300.0	
LCS 240-397921/4	Lab Control Sample	Total/NA	Water	300.0	
240-117926-1 MS	MW-1	Total/NA	Water	300.0	
240-117926-1 MSD	MW-1	Total/NA	Water	300.0	

Analysis Batch: 397925

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	9040C	
LCS 240-397925/2	Lab Control Sample	Total/NA	Water	9040C	
240-117926-1 DU	MW-1	Total/NA	Water	9040C	

Analysis Batch: 397935

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	180.1	
MB 240-397935/3	Method Blank	Total/NA	Water	180.1	
HLCS 240-397935/6	Lab Control Sample	Total/NA	Water	180.1	
LCS 240-397935/5	Lab Control Sample	Total/NA	Water	180.1	
LLCS 240-397935/4	Lab Control Sample	Total/NA	Water	180.1	
240-117926-1 DU	MW-1	Total/NA	Water	180.1	

Analysis Batch: 398091

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-398091/3	Method Blank	Total/NA	Water	300.0	
LCS 240-398091/4	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 398092

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1 - RA	MW-1	Total/NA	Water	300.0	
MB 240-398092/3	Method Blank	Total/NA	Water	300.0	
LCS 240-398092/4	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 398283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	5220D-2011	
MB 240-398283/9	Method Blank	Total/NA	Water	5220D-2011	
LCS 240-398283/10	Lab Control Sample	Total/NA	Water	5220D-2011	

Analysis Batch: 398524

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	2340C-2011	
MB 240-398524/1	Method Blank	Total/NA	Water	2340C-2011	
LCS 240-398524/2	Lab Control Sample	Total/NA	Water	2340C-2011	

General Chemistry (Continued)

Analysis Batch: 398524 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1 MS	MW-1	Total/NA	Water	2340C-2011	
240-117926-1 MSD	MW-1	Total/NA	Water	2340C-2011	

Analysis Batch: 398758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	2540 C-2011	
MB 240-398758/1	Method Blank	Total/NA	Water	2540 C-2011	
LCS 240-398758/2	Lab Control Sample	Total/NA	Water	2540 C-2011	
240-117926-1 DU	MW-1	Total/NA	Water	2540 C-2011	

Analysis Batch: 399437

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	2320B-2011	
MB 240-399437/30	Method Blank	Total/NA	Water	2320B-2011	
LCS 240-399437/29	Lab Control Sample	Total/NA	Water	2320B-2011	

Analysis Batch: 399697

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	2510B-2011	
MB 240-399697/31	Method Blank	Total/NA	Water	2510B-2011	
LCS 240-399697/32	Lab Control Sample	Total/NA	Water	2510B-2011	
240-117926-1 DU	MW-1	Total/NA	Water	2510B-2011	

Analysis Batch: 400424

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-117926-1	MW-1	Total/NA	Water	4500 NH3 D-2011	
MB 240-400424/7	Method Blank	Total/NA	Water	4500 NH3 D-2011	
LCS 240-400424/8	Lab Control Sample	Total/NA	Water	4500 NH3 D-2011	

Lab Chronicle

Client: Earth Data Inc
Project/Site: Dulin Landfill

Job ID: 240-117926-1

Client Sample ID: MW-1

Date Collected: 08/26/19 13:00
Date Received: 08/27/19 09:40

Lab Sample ID: 240-117926-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	398467	08/30/19 16:27	HMB	TAL CAN
Total/NA	Prep	8011			398730	09/03/19 08:26	JBN	TAL CAN
Total/NA	Analysis	8011		1	398771	09/03/19 18:14	JBN	TAL CAN
Total Recoverable	Prep	3005A			398034	08/28/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	398747	08/30/19 20:01	DSH	TAL CAN
Total Recoverable	Prep	3005A			398034	08/28/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	398883	09/03/19 17:36	DSH	TAL CAN
Total/NA	Prep	7470A			398040	08/28/19 12:00	MRL	TAL CAN
Total/NA	Analysis	7470A		1	398222	08/28/19 16:20	DTN	TAL CAN
Total/NA	Analysis	180.1		1	397935	08/27/19 16:27	BLW	TAL CAN
Total/NA	Analysis	2320B-2011		1	399437	09/04/19 22:15	MMM	TAL CAN
Total/NA	Analysis	2340C-2011		1	398524	08/30/19 10:50	TPH	TAL CAN
Total/NA	Analysis	2510B-2011		1	399697	09/09/19 09:54	MMM	TAL CAN
Total/NA	Analysis	2540 C-2011		1	398758	09/03/19 10:10	JESW	TAL CAN
Total/NA	Analysis	300.0		1	397920	08/27/19 17:43	JMB	TAL CAN
Total/NA	Analysis	300.0		1	397921	08/27/19 17:43	JMB	TAL CAN
Total/NA	Analysis	300.0	RA	5	398092	08/28/19 22:19	JMB	TAL CAN
Total/NA	Analysis	4500 NH3 D-2011		1	400424	09/12/19 14:48	JWW	TAL CAN
Total/NA	Analysis	5220D-2011		1	398283	08/29/19 13:59	TPH	TAL CAN
Total/NA	Analysis	9040C		1	397925	08/27/19 15:18	BLW	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: Earth Data Inc
Project/Site: Dulin Landfill

Job ID: 240-117926-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-20
California	State Program	2927	02-23-20
Connecticut	State	PH-0590	12-31-19
Connecticut	State Program	PH-0590	12-31-19
Florida	NELAP	E87225	06-30-20
Florida	NELAP	E87225	06-30-20
Georgia	State	4062	02-23-20
Georgia	State Program	N/A	02-23-20
Illinois	NELAP	200004	07-31-20
Illinois	NELAP	004498	07-31-20
Iowa	State Program	421	06-01-21
Kansas	NELAP	E-10336	04-30-20
Kansas	NELAP	E-10336	04-30-20
Kentucky (UST)	State	112225	02-23-20
Kentucky (UST)	State Program	58	02-23-20
Kentucky (WW)	State	KY98016	12-31-19
Kentucky (WW)	State Program	98016	12-31-19
Minnesota	NELAP	039-999-348	12-31-19 *
Minnesota	NELAP	OH00048	12-31-19
Minnesota (Petrofund)	State Program	3506	07-31-21
New Jersey	NELAP	OH001	06-30-20
New Jersey	NELAP	OH001	06-30-20
New York	NELAP	10975	03-31-20
New York	NELAP	10975	03-31-20
Ohio VAP	State	CL0024	06-05-21
Ohio VAP	State Program	CL0024	06-05-21
Oregon	NELAP	4062	02-23-20
Oregon	NELAP	4062	02-23-20
Pennsylvania	NELAP	68-00340	08-31-20
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-19-11	08-31-20
Texas	NELAP	T104704517-18-10	08-31-20
USDA	Federal	P330-16-00404	12-28-19
Virginia	NELAP	460175	09-14-19 *
Virginia	NELAP	010101	09-14-19
Washington	State	C971	01-12-20
Washington	State Program	C971	01-12-20 *
West Virginia DEP	State	210	12-31-19
West Virginia DEP	State Program	210	12-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

4.4/4.5

Chain of Custody Record

383723

eurofins | Environment Test TestAmerica

Baltimore #201

Address: _____

Regulatory Program: ☐ DW ☐ NPDES ☒ RCRA ☐ Other:

TAL-82

Client Contact	Project Manager: JP Stokes	Site Contact:	Date:	COC No:
Company Name: Earth Data Inc.	Tel/Email: JPStokes@earthdatainc.com	Lab Contact: DeMonico, M.	Carrier:	1 of 1 COCs
Address: 131 Comet Drive	Analysis Turnaround Time			Sampler:
City/State/Zip: Centreville MD 21617	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 410 758 8160	TAT if different from Below Standard			Walk-in Client:
Fax: 410 758 8168	☐ 2 weeks			Lab Sampling:
Project Name: Dulin landfill	☐ 1 week			Job / SDG No.:
Site: Kent County MD, Chestertown	☐ 2 days			
PO# 4697 E	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	2320B, 9040C	2340C - Total Hardness	6010A, 7470A	5220D, SM4500 NH3-D	8260C, Project VOCs	8260C MOD Custom Subset	180.1, 2510B, 2540C calc	300, 300.0 28D	8011 EDB/DBCP VOCs	Sample Specific Notes:
MW-1	8/26/19	1300	G	GW	11	N		X	X	X	X	X	X	X	X	X	

240-117926 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____ - 4 4 3 2 2 - - 2

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: Project Quote # 24023269-2

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: _____ | Therm ID No.: _____

	Company	Date/Time		Company	Date/Time
Relinquished by:	Earth Data Inc	8/26/19 1620	Received by:	ETA	8/26/19 1620
Relinquished by:	8/26/19 17:50	Date/Time:	Received by:		Date/Time: 8/27/19 901
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 117926

Client Earth Data Site Name

Cooler Received on 8/27/19 Opened on 8/27/19

Cooler unpacked by:

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam ~~Plastic Bag~~ None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF **+0.1** °C) Observed Cooler Temp. 4.4 °C Corrected Cooler Temp. 4.5 °C
   IR GUN #36 (CF **+0.6**°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC987808**
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
16. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: JR

18. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot #
MW-1	240-117926-H-1	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-1	240-117926-J-1	Plastic 500ml - with Sulfuric Acid	<2	_____	_____
MW-1	240-117926-K-1	Plastic 500ml - with Nitric Acid	<2	_____	_____

APPENDIX D

Quarterly Gas Monitoring Field Reports
(Gas Wells, Soil Vapor Points and Gas Vents Monitoring)

Earth Data Incorporated

131 Comet Drive, Centreville, Maryland

FIELD NOTES

EDI W.O. # 4697D	**PROJECT:** Kent Co. Landfill - Dulin
DATE: February 25, 2019	**LOCATION:** Chestertown, Maryland

EDI Personnel: D. Smith-Brown, T. Trumbull

Time: 9:30-11:00 pm

Weather: Sunny 46°F

Earth Data Inc. personnel were onsite to sample the soil gas wells, gas vapor points and gas vents at the landfill. Gas vapor readings were taken from each of the four gas wells (GW-1 through G-4). Readings were also taken from the three onsite vents and eight onsite monitoring points (SV-1, 2, 3, 4, 5, 12, 13 and 14). The % LEL and % O_2 were measured using a QRAE® 3 Gas Surveyor. SV-12 was broken upon arrival. The PVC was temporarily fixed using tape. The soil vapor point will need a more permanent fix before the next sampling event in three months.

	%LEL	%O2
GW 1	0	18.7
GW 2	0	16.2
GW 3	0	18.6
GW 4	0	13.1
SV 1	0	20.9
SV 2	0	15.2
SV 3	0	16.9
SV 4	0	18.2
SV 5	0	20.9
SV 12	0	20.4
SV 13	0	15.6
SV 14	0	17.6
V 1	0	18.2
V 2	0	20.9
V 3	0	20.9

Signed: _____

Devan Smith-Brown

Earth Data Incorporated

131 Comet Drive, Centreville, Maryland

FIELD NOTES

EDI W.O. # 4697D	**PROJECT:** Kent Co. Landfill - Dulin
DATE: May 20, 2019	**LOCATION:** Chestertown, Maryland

EDI Personnel: J. Chipman J. Bram

Time: 1:00pm-1:30 pm Weather: Sunny 90°F

Earth Data Inc. personnel were onsite to sample the soil gas wells, gas vapor points and gas vents at the landfill. Gas vapor readings were taken from each of the four gas wells (GW-1 through G-4). Readings were also taken from the three onsite vents and eight onsite monitoring points (SV-1, 2, 3, 4, 5, 12, 13 and 14). The % LEL and % O_2 were measured using a QRAE® 3 Gas Surveyor.

	%LEL	%O2
GW 1	0	12.8
GW 2	0	14.2
GW 3	0	19.5
GW 4	0	13.1
SV 1	0	20.2
SV 2	0	16.0
SV 3	0	17.2
SV 4	0	17.3
SV 5	0	16.7
SV 12	13	16.2
SV 13	0	11.2
SV 14	0	13.2
V 1	90	6.5
V 2	0	14.5
V 3	50	1.2

Signed: _____

Jeff Chipman

Earth Data Incorporated

131 Comet Drive, Centreville, Maryland

FIELD NOTES

EDI W.O. # 4697E	**PROJECT:** Kent Co. Landfill - Dulin
DATE: August 26, 2019	**LOCATION:** Chestertown, Maryland

EDI Personnel: J. Chipman, A. Dunn, S. Wolf

Time: 10:00am-1:30 pm Weather: Sunny 80°F

Earth Data Inc. personnel were onsite to sample the soil gas wells, gas vapor points and gas vents at the landfill. Gas vapor readings were taken from each of the four gas wells (GW-1 through G-4). Readings were also taken from the three onsite vents and eight onsite monitoring points (SV-1, 2, 3, 4, 5, 12, 13 and 14). The % LEL and % O_2 were measured using a QRAE® 3 Gas Surveyor.

	%LEL	%O2
GW 1	0	6.7
GW 2	0	6.6
GW 3	0	16.3
GW 4	0	9.3
SV 1	0	20.2
SV 2	0	14.8
SV 3	0	15.4
SV 4	0	14.7
SV 5	0	14.2
SV 12	0	13.4
SV 13	0	15.3
SV 14	4	12.7
V 1	0	20
V 2	0	11.9
V 3	63	0

Signed: _____

Jeff Chipman

Earth Data Incorporated

131 Comet Drive, Centreville, Maryland

FIELD NOTES

EDI W.O. # 4697E	**PROJECT:** Kent Co. Landfill - Dulin
DATE: November 18, 2019	**LOCATION:** Chestertown, Maryland

EDI Personnel: J. Bram, A. Dunn

Time: 11:30am-1:00 pm

Weather: Overcast 45°F

Earth Data Inc. personnel were onsite to sample the soil gas wells, gas vapor points and gas vents at the landfill. Gas vapor readings were taken from each of the four gas wells (GW-1 through GW-4). Readings were also taken from the three onsite vents (V-1, V-2, and V-3), and eight onsite soil monitoring points (SV-1, 2, 3, 4, 5, 12, 13 and 14). The % LEL and % O_2 were measured using a QRAE® 3 Gas Surveyor.

	%LEL	%O2
GW 1	0	18.7
GW 2	0	12.9
GW 3	0	17.4
GW 4	0	14.7
SV 1	0	16.1
SV 2	0	15.4
SV 3	0	17.1
SV 4	0	16.8
SV 5	0	16.5
SV 12	0	13.1
SV 13	0	16.8
SV 14	4	16.0
V 1	100	8.8
V 2	81	5.2
V 3	100	7.1

Signed: _____

Avery Dunn

APPENDIX E

Historical Water Quality Data Tables
(VOCs, Indicator Parameters, and Total Metals)

MW-1 VOC Analytical Results

VOC Parameter	GW Standard*	2-Mar 1995	15-May 1995	22-May 1995	31-May 1995	10-Oct 1995	3-Jun 1996	20-Nov 1996	3-Jun 1997	6-Oct 1997	8-Jun 1998	26-Oct 1998	28-Jun 1999	28-Sep 1999	19-Jun 2000	13-Nov 2000	18-Jun 2001	29-Oct 2001	17-Jun 2002	7-Oct 2002	14-Jul 2003	23-Feb 2004	15-Nov 2004	10-Aug 2005	27-Feb 2006	23-Aug 2006
1,1,1,2-Tetrachloroethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	NS	NS	NS
1,1,1-Trichloroethane (ug/l)	200	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
1,1,2,2-Tetrachloroethane (ug/l)	0.076	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
1,1,2-Trichloroethane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
1,1-Dichloroethane (ug/l)	2.8	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
1,1-Dichloroethene (ug/l)	7	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	e4	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
1,2,3-Trichloropropane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	NS	NS	NS
1,2-Dibromo-3-Chloropropane (ug/l)	0.2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
1,2-Dibromoethane (EDB) (ug/l)	0.05	NS	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
1,2-Dichlorobenzene (ug/l)	600	NS	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
1,2-Dichloroethane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	e1	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
1,2-Dichloropropane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
1,4-Dichlorobenzene (ug/l)	75	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
2-Butanone (MEK) (ug/l)	560	<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	<50	<50	<50	<50	<50	<50	<50	NA	<50	<5	<5	<5	<50	<5	<5
2-Hexanone (MBK) (ug/l)		<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	<50	<50	<50	<50	<50	<50	<50	NA	<50	<5	<5	<5	<10	<5	<5
4-Methyl-2-Pentanone (MIBK) (ug/l)	630	<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	<50	<50	<50	<50	<50	<50	<50	NA	<50	<5	<5	<5	<10	<5	<5
Acetone (ug/l)	1400	<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	eb8	<50	<50	<50	<50	<50	<50	NA	<50	<25	<25	<25	<10	<5	<5
Acrylonitrile (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS
Benzene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Bromochloromethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	NS	NS	NS
Bromodichloromethane (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Bromoform (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Bromomethane (ug/l)	0.75	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Carbon Disulfide (ug/l)	81	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	<10	<10	<10
Carbon tetrachloride (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Chlorobenzene (ug/l)	100	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Chloroethane (ug/l)	2100	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Chloroform (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Chloromethane (ug/l)	19	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
cis 1,2-Dichloroethene (ug/l)	70	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
cis-1,3-Dichloropropene (ug/l)	0.44	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	NS	NS	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Dibromochloromethane (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Dibromomethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	NS	NS	NS
Dichlorodifluoromethane (ug/l)		<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Ethylbenzene (ug/l)	700	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Iodomethane (Methyl Iodide) (ug/L)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS
m&p-Xylene (ug/l)	10000	**12.5**	NS	NS	NS	<5	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	NA	<5	<10	<10	<10	<2	<2	<2
Methylene chloride (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	eb2	eb2	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Methyl-tert-Butyl Ether (MTBE) (ug/l)	20	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
o-Xylene (ug/l)	10000	<5	NS	NS	NS	<5	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Styrene (ug/l)	100	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Tetrachloroethene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Toluene (ug/l)	1000	12	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
trans-1,2-Dichloroethene (ug/l)	100	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
trans-1,3-Dichloropropene (ug/l)	0.44	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	NS	NS	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
trans-1,4-dichloro-2-butene (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS
Trichloroethene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1
Trichlorofluoromethane (ug/l)		<10	<10	<10	<10	<10	<10	<10	<10	<10	NS	NS	NS	<5	**5.2**	<5	<5	<5	NA	<5	<5	<5	<5	<5	<5	<5
Vinyl acetate (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS
Vinyl chloride (ug/l)	2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5	<1	<1	<1

* Groundwater (GW) Standard based on EPA Maxiumum Contaminant Level, EPA Secondary Drinking Water Standard, or MDE Cleanup Standard for Type I/II Aquifers

e = estimated value, less than quantitative limit; b = artifact of laboratory calibration, found in laboratory blank; NS = parameter not sampled; ND = result below detection limit; NA = not available or not sampled

J = Result is an approximate value that is less than the laboratory Reporting Limit (RL) but greater than or equal to the laboratory Method Detection Limit (MDL).

Continued on back

MW-1 VOC Analytical Results

VOC Parameter	GW Standard*	21-Feb 2007	22-Aug 2007	26-Feb 2008	20-Aug 2008	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
1,1,1,2-Tetrachloroethane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane (ug/l)	200	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane (ug/l)	0.076	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane (ug/l)	2.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene (ug/l)	7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-Chloropropane (ug/l)	0.2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<0.04
1,2-Dibromoethane (EDB) (ug/l)	0.05	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.04
1,2-Dichlorobenzene (ug/l)	600	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene (ug/l)	75	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2-Butanone (MEK) (ug/l)	560	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
2-Hexanone (MBK) (ug/l)		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone (MIBK) (ug/l)	630	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Acetone (ug/l)	1400	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Benzene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane (ug/l)		NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform (ug/l)	80	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane (ug/l)	0.75	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide (ug/l)	81	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Carbon tetrachloride (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane (ug/l)	2100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroform (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane (ug/l)	19	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis 1,2-Dichloroethene (ug/l)	70	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene (ug/l)	0.44	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane (ug/l)		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	NS
Ethylbenzene (ug/l)	700	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Iodomethane (Methyl Iodide) (ug/L)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
m&p-Xylene (ug/l)	10000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Methylene chloride (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl-tert-Butyl Ether (MTBE) (ug/l)	20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
o-Xylene (ug/l)	10000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Styrene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene (ug/l)	1000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene (ug/l)	0.44	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-dichloro-2-butene (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Trichloroethene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl acetate (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride (ug/l)	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Continued from front

MW-2 VOC Analytical Results

VOC Parameter	GW Standard*	2-Mar 1995	15-May 1995	22-May 1995	31-May 1995	10-Oct 1995	3-Jun 1996	20-Nov 1996	3-Jun 1997	6-Oct 1997	8-Jun 1998	26-Oct 1998	28-Jun 1999	28-Sep 1999	19-Jun 2000	13-Nov 2000	18-Jun 2001	29-Oct 2001	18-Jun 2002	7-Oct 2002	14-Jul 2003	23-Feb 2004	15-Nov 2004	10-Aug 2005	27-Feb 2006	23-Aug 2006
1,1,1,2-Tetrachloroethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	NS	NS
1,1,1-Trichloroethane (ug/l)	200	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
1,1,2,2-Tetrachloroethane (ug/l)	0.076	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
1,1,2-Trichloroethane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
1,1-Dichloroethane (ug/l)	2.8	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
1,1-Dichloroethene (ug/l)	7	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
1,2,3-Trichloropropane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	NS	NS
1,2-Dibromo-3-Chloropropane (ug/l)	0.2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
1,2-Dibromoethane (EDB) (ug/l)	0.05	NS	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
1,2-Dichlorobenzene (ug/l)	600	NS	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
1,2-Dichloroethane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
1,2-Dichloropropane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
1,4-Dichlorobenzene (ug/l)	75	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
2-Butanone (MEK) (ug/l)	560	<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<5	<5	<5	<50	<5	<5
2-Hexanone (MBK) (ug/l)		<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<5	<5	<5	<10	<5	<5
4-Methyl-2-Pentanone (MIBK) (ug/l)	630	<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<5	<5	<5	<10	<5	<5
Acetone (ug/l)	1400	<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	eb2	<50	<50	<50	<50	<50	<50	<50	<50	<25	<25	<25	<10	<5	<5
Acrylonitrile (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Benzene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Bromochloromethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	NS	NS
Bromodichloromethane (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Bromoform (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Bromomethane (ug/l)	0.75	<10	<10	<10	<10	<10	<10	<10	NS	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Carbon Disulfide (ug/l)	81	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<10	<10	<10
Carbon tetrachloride (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Chlorobenzene (ug/l)	100	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Chloroethane (ug/l)	2100	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Chloroform (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Chloromethane (ug/l)	19	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
cis 1,2-Dichloroethene (ug/l)	70	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<1	<1	<1
cis-1,3-Dichloropropene (ug/l)	0.44	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	NS	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Dibromochloromethane (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Dibromomethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	NS	NS
Dichlorodifluoromethane (ug/l)		<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Ethylbenzene (ug/l)	700	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Iodomethane (Methyl Iodide) (ug/L)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
m&p-Xylene (ug/l)	10000	<5	NS	NS	NS	<5	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	<5	<10	<10	<10	<2	<2	<2
Methylene chloride (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	eb2	eb2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Methyl-tert-Butyl Ether (MTBE) (ug/l)	20	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
o-Xylene (ug/l)	10000	<5	NS	NS	NS	<5	NS	<5	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Styrene (ug/l)	100	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Tetrachloroethene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Toluene (ug/l)	1000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
trans-1,2-Dichloroethene (ug/l)	100	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<1	<1	<1
trans-1,3-Dichloropropene (ug/l)	0.44	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<1	<1	<1
trans-1,4-dichloro-2-butene (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Trichloroethene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1
Trichlorofluoromethane (ug/l)		<10	<10	<10	<10	<10	<10	<10	<10	<10	NS	NS	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl acetate (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Vinyl chloride (ug/l)	2	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1

* Groundwater (GW) Standard based on EPA Maxiumum Contaminant Level, EPA Secondary Drinking Water Standard, or MDE Cleanup Standard for Type I/II Aquifers

e = estimated value, less than quantitative limit; b = artifact of laboratory calibration, found in laboratory blank; NS = parameter not sampled; ND = result below detection limit; NA = not available or not sampled

J = Result is an approximate value that is less than the laboratory Reporting Limit (RL) but greater than or equal to the laboratory Method Detection Limit (MDL).

Continued on back

MW-2 VOC Analytical Results

VOC Parameter	GW Standard*	21-Feb 2007	22-Aug 2007	27-Feb 2008	20-Aug 2008	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
1,1,1,2-Tetrachloroethane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane (ug/l)	200	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane (ug/l)	0.076	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane (ug/l)	2.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene (ug/l)	7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-Chloropropane (ug/l)	0.2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<0.04
1,2-Dibromoethane (EDB) (ug/l)	0.05	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.04
1,2-Dichlorobenzene (ug/l)	600	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene (ug/l)	75	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2-Butanone (MEK) (ug/l)	560	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
2-Hexanone (MBK) (ug/l)		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone (MIBK) (ug/l)	630	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Acetone (ug/l)	1400	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Benzene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane (ug/l)		NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform (ug/l)	80	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane (ug/l)	0.75	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide (ug/l)	81	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Carbon tetrachloride (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane (ug/l)	2100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroform (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane (ug/l)	19	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis 1,2-Dichloroethene (ug/l)	70	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene (ug/l)	0.44	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane (ug/l)		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	NS
Ethylbenzene (ug/l)	700	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Iodomethane (Methyl Iodide) (ug/L)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
m&p-Xylene (ug/l)	10000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Methylene chloride (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl-tert-Butyl Ether (MTBE) (ug/l)	20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
o-Xylene (ug/l)	10000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Styrene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene (ug/l)	1000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene (ug/l)	0.44	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-dichloro-2-butene (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Trichloroethene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl acetate (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride (ug/l)	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Continued from front

MW-3 VOC Analytical Results

VOC Parameter	GW Standard*	2-Mar 1995	15-May 1995	22-May 1995	31-May 1995	10-Oct 1995	3-Jun 1996	20-Nov 1996	3-Jun 1997	6-Oct 1997	8-Jun 1998	26-Oct 1998	28-Jun 1999	28-Oct 1999	19-Jun 2000	15-Nov 2000	18-Jun 2001	29-Oct 2001	17-Jun 2002	7-Oct 2002	27-Feb 2006	23-Aug 2006	21-Feb 2007	22-Aug 2007	27-Feb 2008	20-Aug 2008
1,1,1,2-Tetrachloroethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	NS	NS	NS	NS	NS	NS
1,1,1-Trichloroethane (ug/l)	200	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane (ug/l)	0.076	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane (ug/l)	2.8	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene (ug/l)	7	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	NS	NS	NS	NS	NS	NS
1,2-Dibromo-3-Chloropropane (ug/l)	0.2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<10	<10	<10	<10
1,2-Dibromoethane (EDB) (ug/l)	0.05	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene (ug/l)	600	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene (ug/l)	75	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
2-Butanone (MEK) (ug/l)	560	<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	<50	<50	<50	<50	<50	<50	<50	<50	DRY	<5	<5	<10	<10	<10	<10
2-Hexanone (MBK) (ug/l)		<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	<50	<50	<50	<50	<50	<50	<50	<50	DRY	<5	<5	<10	<10	<10	<10
4-Methyl-2-Pentanone (MIBK) (ug/l)	630	<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	<50	<50	<50	<50	<50	<50	<50	<50	DRY	<5	<5	<5	<5	<5	<5
Acetone (ug/l)	1400	<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	<50	<50	<50	<50	<50	<50	<50	<50	DRY	<5	<5	<10	<10	<10	<10
Acrylonitrile (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Benzene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Bromochloromethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	NS	NS	NS	NS	NS	<1
Bromodichloromethane (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Bromoform (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<5	<5
Bromomethane (ug/l)	0.75	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Carbon Disulfide (ug/l)	81	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	<10	<10	<10	<10	<10	<10
Carbon tetrachloride (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Chlorobenzene (ug/l)	100	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Chloroethane (ug/l)	2100	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Chloroform (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Chloromethane (ug/l)	19	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
cis 1,2-Dichloroethene (ug/l)	70	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene (ug/l)	0.44	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Dibromochloromethane (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Dibromomethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	NS	NS	NS	NS	NS	NS
Dichlorodifluoromethane (ug/l)		<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Ethylbenzene (ug/l)	700	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Iodomethane (Methyl Iodide) (ug/L)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
m&p-Xylene (ug/l)	10000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	<5	DRY	<2	<2	<2	<2	<2	<2
Methylene chloride (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	eb2	eb3	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Methyl-tert-Butyl Ether (MTBE) (ug/l)	20	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
o-Xylene (ug/l)	10000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Styrene (ug/l)	100	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Tetrachloroethene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Toluene (ug/l)	1000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene (ug/l)	100	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene (ug/l)	0.44	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
trans-1,4-dichloro-2-butene (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Trichloroethene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane (ug/l)		<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<5	<5	<5
Vinyl acetate (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Vinyl chloride (ug/l)	2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	DRY	<1	<1	<1	<1	<1	<1

* Groundwater (GW) Standard based on EPA Maxiumum Contaminant Level, EPA Secondary Drinking Water Standard, or MDE Cleanup Standard for Type I/II Aquifers

e = estimated value, less than quantitative limit; b = artifact of laboratory calibration, found in laboratory blank; NS = parameter not sampled; ND = result below detection limit; NA = not available or not sampled

J = Result is an approximate value that is less than the laboratory Reporting Limit (RL) but greater than or equal to the laboratory Method Detection Limit (MDL).

Continued on back

MW-3 VOC Analytical Results

VOC Parameter	GW Standard*	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
1,1,1,2-Tetrachloroethane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane (ug/l)	200	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane (ug/l)	0.076	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane (ug/l)	2.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene (ug/l)	7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-Chloropropane (ug/l)	0.2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<0.04
1,2-Dibromoethane (EDB) (ug/l)	0.05	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.04
1,2-Dichlorobenzene (ug/l)	600	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene (ug/l)	75	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2-Butanone (MEK) (ug/l)	560	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
2-Hexanone (MBK) (ug/l)		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone (MIBK) (ug/l)	630	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Acetone (ug/l)	1400	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Benzene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane (ug/l)		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane (ug/l)	0.75	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide (ug/l)	81	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Carbon tetrachloride (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane (ug/l)	2100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroform (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane (ug/l)	19	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis 1,2-Dichloroethene (ug/l)	70	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene (ug/l)	0.44	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane (ug/l)		<1	<1	<1	<1	<1	<1	<1	<1	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	NS
Ethylbenzene (ug/l)	700	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Iodomethane (Methyl Iodide) (ug/L)		NS	NS	NS	NS	NS	NS	NS	NS	NS	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
m&p-Xylene (ug/l)	10000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Methylene chloride (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl-tert-Butyl Ether (MTBE) (ug/l)	20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
o-Xylene (ug/l)	10000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Styrene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene (ug/l)	1000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene (ug/l)	0.44	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-dichloro-2-butene (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Trichloroethene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl acetate (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride (ug/l)	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Continued from front

MW-4 VOC Analytical Results

VOC Parameter	GW Standard*	6-Mar 1995	15-May 1995	22-May 1995	31-May 1995	10-Oct 1995	3-Jun 1996	21-Nov 1996	3-Jun 1997	6-Oct 1997	26-Oct 1998	28-Jun 1999	28-Sep 1999	21-Jun 2000	15-Nov 2000	18-Jun 2001	29-Oct 2001	18-Jun 2002	7-Oct 2002	14-Jul 2003	23-Feb 2004	15-Nov 2004	10-Aug 2005	27-Feb 2006	23-Aug 2006	21-Feb 2007
1,1,1,2-Tetrachloroethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	NS	NS	NS	NS
1,1,1-Trichloroethane (ug/l)	200	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane (ug/l)	0.076	<10	<5	<5	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<1	<1	<1	<1
1,1,2-Trichloroethane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
1,1-Dichloroethane (ug/l)	2.8	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
1,1-Dichloroethene (ug/l)	7	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
1,2,3-Trichloropropane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	NS	NS	NS	NS
1,2-Dibromo-3-Chloropropane (ug/l)	0.2	<10	<5	<5	<5	<10	<5	<5	<10	<10	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<1	<1	<1	<10
1,2-Dibromoethane (EDB) (ug/l)	0.05	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<1	<1	<1	<1
1,2-Dichlorobenzene (ug/l)	600	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
1,2-Dichloroethane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
1,2-Dichloropropane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
1,4-Dichlorobenzene (ug/l)	75	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
2-Butanone (MEK) (ug/l)	560	<20	<5	<20	<20	<20	<20	<20	<20	<50	<50	<50	<50	<50	<50	NS	<50	<50	<50	<5	<5	<5	<50	<5	<5	<10
2-Hexanone (MBK) (ug/l)		<20	<5	<20	<20	<20	<20	<20	<20	<50	<50	<50	<50	<50	<50	NS	<50	<50	<50	<5	<5	<5	<10	<5	<5	<10
4-Methyl-2-Pentanone (MIBK) (ug/l)	630	<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	<50	<5	<50	<50	NS	<50	<50	<50	<5	<5	<5	<10	<5	<5	<5
Acetone (ug/l)	1400	<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	<50	<25	<50	<50	NS	<50	<50	<50	<25	<25	<25	<10	<10	<10	<10
Acrylonitrile (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Benzene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Bromochloromethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	NS	NS	NS	NS
Bromodichloromethane (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Bromoform (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Bromomethane (ug/l)	0.75	<10	<5	<5	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	NS	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Carbon Disulfide (ug/l)	81	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<10	<10	<10	<10
Carbon tetrachloride (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Chlorobenzene (ug/l)	100	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Chloroethane (ug/l)	2100	<10	<5	<5	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	NS	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Chloroform (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Chloromethane (ug/l)	19	<10	<5	<5	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	NS	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
cis 1,2-Dichloroethene (ug/l)	70	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
cis-1,3-Dichloropropene (ug/l)	0.44	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<1	<1	<1	<1
Dibromochloromethane (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Dibromomethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	NS	NS	NS	NS
Dichlorodifluoromethane (ug/l)		<10	<5	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	NS	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Ethylbenzene (ug/l)	700	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Iodomethane (Methyl Iodide) (ug/L)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
m&p-Xylene (ug/l)	10000	<5	NS	NS	NS	<5	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	NS	<5	<5	<10	<10	<10	<2	<2	<2	<2
Methylene chloride (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	eb2	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Methyl-tert-Butyl Ether (MTBE) (ug/l)	20	<5	<20	<5	<5	<5	<20	<20	<20	<20	<50	<50	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<1	<1	<1	<1
o-Xylene (ug/l)	10000	<5	NS	NS	NS	<5	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Styrene (ug/l)	100	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Tetrachloroethene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Toluene (ug/l)	1000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
trans-1,2-Dichloroethene (ug/l)	100	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
trans-1,3-Dichloropropene (ug/l)	0.44	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<5	<1	<1	<1	<1
trans-1,4-dichloro-2-butene (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Trichloroethene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1
Trichlorofluoromethane (ug/l)		<10	<5	<5	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	NS	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl acetate (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Vinyl chloride (ug/l)	2	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	NS	<5	<5	<5	<5	<5	<1	<1	<1	<1

* Groundwater (GW) Standard based on EPA Maxiumum Contaminant Level, EPA Secondary Drinking Water Standard, or MDE Cleanup Standard for Type I/II Aquifers

e = estimated value, less than quantitative limit; b = artifact of laboratory calibration, found in laboratory blank; NS = parameter not sampled; ND = result below detection limit; NA = not available or not sampled

J = Result is an approximate value that is less than the laboratory Reporting Limit (RL) but greater than or equal to the laboratory Method Detection Limit (MDL).

Continued on back

MW-4 VOC Analytical Results

VOC Parameter	GW Standard*	22-Aug 2007	27-Feb 2008	20-Aug 2008	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
1,1,1,2-Tetrachloroethane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane (ug/l)	200	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane (ug/l)	0.076	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane (ug/l)	2.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene (ug/l)	7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-Chloropropane (ug/l)	0.2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<0.04
1,2-Dibromoethane (EDB) (ug/l)	0.05	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.04
1,2-Dichlorobenzene (ug/l)	600	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene (ug/l)	75	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2-Butanone (MEK) (ug/l)	560	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
2-Hexanone (MBK) (ug/l)		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone (MIBK) (ug/l)	630	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Acetone (ug/l)	1400	<10	<10	<10	**21**	**21**	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Benzene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane (ug/l)		NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform (ug/l)	80	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane (ug/l)	0.75	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide (ug/l)	81	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Carbon tetrachloride (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane (ug/l)	2100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroform (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane (ug/l)	19	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis 1,2-Dichloroethene (ug/l)	70	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene (ug/l)	0.44	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane (ug/l)		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	NS
Ethylbenzene (ug/l)	700	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Iodomethane (Methyl Iodide) (ug/L)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
m&p-Xylene (ug/l)	10000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Methylene chloride (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl-tert-Butyl Ether (MTBE) (ug/l)	20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
o-Xylene (ug/l)	10000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Styrene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene (ug/l)	1000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene (ug/l)	0.44	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-dichloro-2-butene (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Trichloroethene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl acetate (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride (ug/l)	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Continued from front

MW-5 VOC Analytical Results

VOC Parameter	GW Standard*	6-Mar 1995	15-May 1995	23-May 1995	31-May 1995	11-Oct 1995	3-Jun 1996	20-Nov 1996	3-Jun 1997	6-Oct 1997	8-Jun 1998	26-Oct 1998	28-Jun 1999	28-Sep 1999	21-Jun 2000	15-Nov 2000	20-Jun 2001	31-Oct 2001	19-Jun 2002	10-Oct 2002	14-Jul 2003	23-Feb 2004	15-Nov 2004	10-Aug 2005	27-Feb 2006	23-Aug 2006
1,1,1,2-Tetrachloroethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	NS	NS	NS
1,1,1-Trichloroethane (ug/l)	200	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
1,1,2,2-Tetrachloroethane (ug/l)	0.076	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
1,1,2-Trichloroethane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
1,1-Dichloroethane (ug/l)	2.8	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
1,1-Dichloroethene (ug/l)	7	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
1,2,3-Trichloropropane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	NS	NS	NS
1,2-Dibromo-3-Chloropropane (ug/l)	0.2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
1,2-Dibromoethane (EDB) (ug/l)	0.05	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
1,2-Dichlorobenzene (ug/l)	600	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
1,2-Dichloroethane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
1,2-Dichloropropane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
1,4-Dichlorobenzene (ug/l)	75	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
2-Butanone (MEK) (ug/l)	560	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<100	<50	<50	<50	<50	<50	<50	DRY	<5	<5	<5	<50	<5	<5
2-Hexanone (MBK) (ug/l)		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<100	<50	<50	<50	<50	<50	<50	DRY	<5	<5	<5	<10	<5	<5
4-Methyl-2-Pentanone (MIBK) (ug/l)	630	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<100	<50	<50	<50	<50	<50	<50	DRY	<5	<5	<5	<10	<5	<5
Acetone (ug/l)	1400	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<100	<50	<50	<50	<50	<50	<50	DRY	<25	<25	<25	<10	<10	<10
Acrylonitrile (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Benzene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Bromochloromethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	NS	NS	NS
Bromodichloromethane (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Bromoform (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Bromomethane (ug/l)	0.75	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Carbon Disulfide (ug/l)	81	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	<10	<10	<10
Carbon tetrachloride (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Chlorobenzene (ug/l)	100	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Chloroethane (ug/l)	2100	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Chloroform (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Chloromethane (ug/l)	19	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
cis 1,2-Dichloroethene (ug/l)	70	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
cis-1,3-Dichloropropene (ug/l)	0.44	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Dibromochloromethane (ug/l)	80	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Dibromomethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	NS	NS	NS
Dichlorodifluoromethane (ug/l)		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Ethylbenzene (ug/l)	700	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Iodomethane (Methyl Iodide) (ug/L)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
m&p-Xylene (ug/l)	10000	NS	NS	NS	NS	<5	NS	NS	NS	NS	NS	NS	<10	<5	<5	<5	<5	<5	<5	DRY	<10	<10	<10	<2	<2	<2
Methylene chloride (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Methyl-tert-Butyl Ether (MTBE) (ug/l)	20	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
o-Xylene (ug/l)	10000	NS	NS	NS	NS	<5	NS	NS	NS	NS	NS	NS	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Styrene (ug/l)	100	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Tetrachloroethene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Toluene (ug/l)	1000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
trans-1,2-Dichloroethene (ug/l)	100	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
trans-1,3-Dichloropropene (ug/l)	0.44	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
trans-1,4-dichloro-2-butene (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Trichloroethene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1
Trichlorofluoromethane (ug/l)		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<5	<5	<5
Vinyl acetate (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Vinyl chloride (ug/l)	2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	DRY	<5	<5	<5	<1	<1	<1

* Groundwater (GW) Standard based on EPA Maxiumum Contaminant Level, EPA Secondary Drinking Water Standard, or MDE Cleanup Standard for Type I/II Aquifers

e = estimated value, less than quantitative limit; b = artifact of laboratory calibration, found in laboratory blank; NS = parameter not sampled; ND = result below detection limit; NA = not available or not sampled

J = Result is an approximate value that is less than the laboratory Reporting Limit (RL) but greater than or equal to the laboratory Method Detection Limit (MDL).

Continued on back

MW-5 VOC Analytical Results

VOC Parameter	GW Standard*	21-Feb 2007	22-Aug 2007	26-Feb 2008	20-Aug 2008	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
1,1,1,2-Tetrachloroethane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane (ug/l)	200	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane (ug/l)	0.076	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane (ug/l)	2.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene (ug/l)	7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-Chloropropane (ug/l)	0.2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<0.039
1,2-Dibromoethane (EDB) (ug/l)	0.05	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.039
1,2-Dichlorobenzene (ug/l)	600	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene (ug/l)	75	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2-Butanone (MEK) (ug/l)	560	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
2-Hexanone (MBK) (ug/l)		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5
4-Methyl-2-Pentanone (MIBK) (ug/l)	630	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Acetone (ug/l)	1400	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acrylonitrile (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Benzene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane (ug/l)		NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform (ug/l)	80	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane (ug/l)	0.75	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide (ug/l)	81	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Carbon tetrachloride (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane (ug/l)	2100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroform (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane (ug/l)	19	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis 1,2-Dichloroethene (ug/l)	70	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene (ug/l)	0.44	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane (ug/l)	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane (ug/l)		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	NS
Ethylbenzene (ug/l)	700	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Iodomethane (Methyl Iodide) (ug/L)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
m&p-Xylene (ug/l)	10000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Methylene chloride (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl-tert-Butyl Ether (MTBE) (ug/l)	20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
o-Xylene (ug/l)	10000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Styrene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene (ug/l)	1000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene (ug/l)	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene (ug/l)	0.44	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-dichloro-2-butene (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Trichloroethene (ug/l)	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane (ug/l)		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl acetate (ug/l)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride (ug/l)	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Continued from front

MW-1 Indicator Analytical Results

Parameter	GW* Standard	2-Mar 1995	15-May 1995	22-May 1995	31-May 1995	10-Oct 1995	3-Jun 1996	20-Nov 1996	3-Jun 1997	6-Oct 1997	8-Jun 1998	26-Oct 1998	28-Jun 1999	28-Sep 1999	19-Jun 2000	13-Nov 2000	18-Jun 2001	29-Oct 2001	17-Jun 2002	7-Oct 2002	14-Jul 2003	23-Feb 2004	15-Nov 2004	10-Aug 2005	27-Feb 2006	23-Aug 2006
Alkalinity (mg/l)	-	4	4	4	5	5	22	6	9	3	5	6	7	7	11	5	5	4	NA	4	43	4	3	<5	<5	<1
Ammonia (mg/l)	-	<0.2	<0.2	<0.2	<0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.2	NA	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chemical Oxygen Demand (COD) (mg/l)	-	10	10	10	10	10	10	10	30	10	10	10	10	10	10	10	10	10	NA	<10	<10	<10	<10	<20	<20	<20
Chloride (mg/l)	250	11	11	11	9	10	58	12	97	10	12	10	10	10	10	10	10	10	NA	<10	<10	<10	<10	7	8.1	6.5
Dissolved Solids (mg/l)	500	61	84	78	122	52	364	70	492	58	68	47	65	44	76	39	54	19	NA	24	117	40	47	51	57	51
Hardness (mg/l)	-	19	17	13	35	30	165	18	186	15	28	67	27	29	18	27	33	14	NA	11	54	11	10	17	20	16
Nitrate (mg/l)	10	4.9	4.9	5.1	12.2	3.8	6.5	5.8	8.5	4.8	5.7	3.7	4.3	3.7	3.9	3	3.7	3.1	NA	2.9	6.4	3.2	3.6	4.5	5.9	5
pH (S.U.)	6.0 - 8.5	5.8	5.2	4.9	4.9	5.1	5.1	7.4	6.5	7.3	6.3	6.4	5.1	5.7	5.5	6	5.8	5.9	NA	5.4	5.8	5.7	5.8	5.1	5	5.6
Specific Conductance (us/cm)	-	56	106	61	63	59	81	72	59	61	70	57	59	NS	53	47	36	51	NA	46	109	47	47	87	95.7	87.6
Sulfate (mg/l)	250	2	3.7	2	2	2	NS	NS	NS	NS	NS	NS	NS	NS	NS	10	10	10	NA	<10	19.9	<10	<10	<1	<1	<1
Turbidity (NTU)	5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2	10.3	<1

MW-1 Metals Analytical Results

Parameter	GW* Standard	2-Mar 1995	15-May 1995	22-May 1995	31-May 1995	10-Oct 1995	3-Jun 1996	20-Nov 1996	3-Jun 1997	6-Oct 1997	8-Jun 1998	26-Oct 1998	28-Jun 1999	28-Sep 1999	19-Jun 2000	13-Nov 2000	18-Jun 2001	29-Oct 2001	17-Jun 2002	7-Oct 2002	14-Jul 2003	23-Feb 2004	15-Nov 2004	10-Aug 2005	27-Feb 2006	23-Aug 2006
Antimony (mg/l)	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS
Arsenic (mg/l)	0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005	<0.005
Barium (mg/l)	2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	30	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NA	<0.5	<0.5	<0.05	<0.05	0.026	0.028	0.23
Beryllium (mg/l)	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS
Cadmium (mg/l)	0.005	<0.1	<0.05	<0.005	<0.005	<0.05	<0.05	<0.05	<0.1	<0.1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005
Calcium (mg/l)		3.9	3.7	3.6	7	3.5	7.3	5.5	4.1	3.6	4.9	3.6	4.01	3.96	3.66	3.12	13.5	2.84	NA	2.81	19.6	2.98	3.36	4.2	4.8	4
Chromium (mg/l)	0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005
Cobalt (mg/l)	0.073	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS
Copper (mg/l)	1.3	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<5	<0.1	<0.1	<0.1	<0.1	<0.14	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005
Iron (mg/l)	1.4	1.5	7.59	0.85	0.11	4.42	0.76	0.28	<0.5	<0.5	<0.5	1.39	1	0.91	<0.5	1.35	3.75	0.79	NA	<1	4.87	<0.5	<0.5	<0.1	0.64	0.21
Lead (mg/l)	0.015	<0.5	<0.5	<0.05	0.006	<0.5	<0.25	<0.25	<0.25	<0.25	<5	<0.25	<0.25	<0.25	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005
Magnesium (mg/l)		1.5	2	1.6	3.1	1.5	3	2.1	3	1.3	1.9	1.5	1.59	1.61	1.45	1.33	6.04	1.16	NA	1.09	7.51	1.19	1.3	1.7	2	1.5
Manganese (mg/l)	0.043	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS
Mercury (mg/l)	0.002	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	NA	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001
Nickel (mg/l)	0.039	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS
Potassium (mg/l)		2.2	3.6	2.16	2.39	3	2.2	3.3	2.2	2	2.4	1.7	2.5	<1	1.82	1.88	3.27	1.16	NA	1.73	4.68	1.63	1.8	2	2.1	1.8
Selenium (mg/l)	0.05	<0.05	<0.01	<0.01	<0.05	<0.025	<0.05	<0.05	<0.05	<0.05	<5	<0.059	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005	<0.005
Silver (mg/l)	0.0094	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS
Sodium (mg/l)		5.8	5.5	6	5.7	4.9	9.2	6.9	6.4	5.3	7.2	5.2	5.14	5.12	5.41	4.56	13	4.72	NA	4.44	5.82	4.45	5.06	5.3	5.7	5
Thallium (mg/l)	0.002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS
Vanadium (mg/l)	0.0086	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS
Zinc (mg/l)	0.6	<0.5	<0.5	<0.5	<0.1	<0.05	0.23	<0.1	0.23	<0.5	15	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NA	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05

* Groundwater (GW) Standard based on EPA Maxiumum Contaminant Level, EPA Secondary Drinking Water Standard, or MDE Cleanup Standard for Type I/II Aquifers
NS = parameter not sampled; ND = result below detection limit; NA = not available or not sampled
J = Result is an approximate value that is less than the laboratory Reporting Limit (RL) but greater than or equal to the laboratory Method Detection Limit (MDL).

Continued on back

MW-1 Indicator Analytical Results

Parameter	GW* Standard	21-Feb 2007	22-Aug 2007	26-Feb 2008	20-Aug 2008	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
Alkalinity (mg/l)	-	<5	<5	<5	5	<5	<5	3.5	5	4	3	4	5	4	2	2.7	2.8	2.6	3.1	3.2	1.4	1.1	1.6	1	1.2	1.1
Ammonia (mg/l)	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chemical Oxygen Demand (COD) (mg/l)	-	<20	<20	<20	<10	<20	<20	<10	<5	5	<5	<5	<5	<5	<5	<5	<5	<5	5	<5	<5	<5	<5	<5	<5	6
Chloride (mg/l)	250	7.5	7.1	8.8	7.2	7.5	8.2	7.6	8.3	8.6	8.5	8.2	11	9.6	10	8.9	11	10	11	12	12	13	13	13	14	15
Dissolved Solids (mg/l)	500	73	73	81	81	64	60	100	110	60	67	91	64	100	90	89	68	92	73	120	110	140	110	170	130	130
Hardness (mg/l)	-	17	18	NS	17	19	21	20	29	21	24	24	29	28	35	33	36	38	40	41	49	47	47	48	81	60
Nitrate (mg/l)	10	5.7	5.5	6.3	5.8	6.1	6.5	6.9	6.1	6.6	6.3	6.5	8.3	8.2	9.3	8.2	9.6	10	11	13	13	14	15	16	16	18
pH (S.U.)	6.0 - 8.5	5.7	5.9	4.9	5	5	5	5.4	4.9	5.3	6.4	4.8	5.6	5.4	5.9	5.5	5.4	5.2	5.3	5.2	6.5	5.3	5.5	5.3	5.5	5.6
Specific Conductance (us/cm)	-	83	85.9	101	83	84.3	96.6	93	105	81	130	95	120	120	130	130	130	140	160	170	160	160	180	180	180	190
Sulfate (mg/l)	250	<1	<0.1	<0.1	0.1	<0.2	1.2	<0.2	2	0.3	1.6	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Turbidity (NTU)	5	0.7	3.3	3.1	1.4	4.8	41	0.9	71	1.5	0.74	1.2	0.73	0.57	0.76	0.87	0.6	0.63	1.1	0.75	1.1	<0.5	<0.5	1	<0.5	0.97

MW-1 Metals Analytical Results

Parameter	GW* Standard	21-Feb 2007	22-Aug 2007	26-Feb 2008	20-Aug 2008	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
Antimony (mg/l)	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (mg/l)	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (mg/l)	2	0.026	0.026	0.032	0.028	0.028	0.031	0.029	0.038	0.03	0.032	0.03	0.042	0.038	0.055	0.046	0.05	0.056	0.0509	0.0652	0.0618	0.0678	0.0701	0.0688	0.0735	0.0749
Beryllium (mg/l)	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Calcium (mg/l)		4.4	4.5	4.8	4	4.5	4.8	4.7	7.2	5	6	6.3	7.2	6.8	8.9	8.1	8.6	9	10.2	9.78	12.2	11	11.5	12	24	15.9
Chromium (mg/l)	0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.0097	0.0018	0.0088	0.0018	0.0018	0.0018	0.0014	0.0017	0.002	0.0017	0.0017	0.0017	0.0021	0.0015	0.0015	0.0015	0.0018	0.0015	0.0016	0.0014
Cobalt (mg/l)	0.073	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	J0.00078
Copper (mg/l)	1.3	<0.005	<0.005	<0.005	<0.005	<0.005	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (mg/l)	1.4	0.042	<0.1	0.16	<0.1	0.28	1.8	<0.1	1.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	J0.0234
Lead (mg/l)	0.015	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (mg/l)		1.4	1.7	2.2	1.7	1.8	2.1	2.1	2.8	2.1	2.2	2.1	2.8	2.6	3.2	3	3.6	3.7	3.62	3.93	4.5	4.68	4.5	4.43	5.11	5.02
Manganese (mg/l)	0.043	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0093	0.012	0.011	0.012	0.014	0.0129	0.0148	0.0142	0.0159	0.0169	0.0162	0.0181	0.0171
Mercury (mg/l)	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel (mg/l)	0.039	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0025	0.0031	0.003	0.0013	0.0036	0.0039	0.0037	0.0042	0.0045	0.0044	0.0045	0.0051	0.0054
Potassium (mg/l)		1.7	1.9	2.2	1.9	2	2.4	2	2.6	2.1	2.2	2.2	2.4	2.3	2.7	2.5	2.7	2.6	2.69	2.76	2.88	3.35	3.13	3.05	3.34	3.18
Selenium (mg/l)	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver (mg/l)	0.0094	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sodium (mg/l)		4.2	5.4	6	5.5	5.6	5.9	5.8	7.4	6.5	6.5	6.9	7.6	6.3	7.5	7.7	7.2	8.6	8.34	10	11.3	8.71	10.4	9.92	11.5	9.85
Thallium (mg/l)	0.002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0101	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium (mg/l)	0.0086	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (mg/l)	0.6	<0.05	<0.05	<0.02	<0.02	<0.02	0.028	<0.02	<0.02	<0.02	0.021	0.023	0.022	<0.02	0.03	0.026	0.029	0.024	0.0263	0.0276	0.0282	0.0303	0.0348	0.0277	0.0269	0.0303

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Appendix E. Summary of groundwater quality data (Indicator Parameters, Total Metals and VOCs), Dulin Rubble Landfill, Kent County, Maryland

MW-2 Indicator Analytical Results

Parameter	GW* Standard	2-Mar 1995	15-May 1995	22-May 1995	31-May 1995	10-Oct 1995	3-Jun 1996	20-Nov 1996	3-Jun 1997	6-Oct 1997	8-Jun 1998	26-Oct 1998	28-Jun 1999	28-Sep 1999	19-Jun 2000	13-Nov 2000	18-Jun 2001	29-Oct 2001	17-Jun 2002	7-Oct 2002	14-Jul 2003	23-Feb 2004	15-Nov 2004	10-Aug 2005	27-Feb 2006	23-Aug 2006
Alkalinity (mg/l)	-	4	4	4	4	4	6	5	4	3	4	104	7	7	5	5	6	3	NS	4	42	4	3	<5	<5	<5
Ammonia (mg/l)	-	<0.2	<0.2	<0.2	<0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.02	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2
Chemical Oxygen Demand (COD) (mg/l)	-	10	10	10	10	10	10	10	10	10	10	10	10	<10	<10	10	<10	<10	<10	<10	<10	<10	<10	<20	<20	<20
Chloride (mg/l)	250	11	10	10	16	9	11	11	11	10	13	82	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	7.7	8.1	7.9
Dissolved Solids (mg/l)	500	103	116	122	138	106	102	72	62	74	142	492	46	50	54	42	56	80	99	78	118	104	100	99	102	119
Hardness (mg/l)	-	39	34	33	35	44	36	16	24	15	38	18	20	20	20	18	27	54	33	39	54	33	37	39	39	37
Nitrate (mg/l)	10	12	11.4	11.8	11	11.4	7.2	5.8	4.6	4.8	14.2	3.7	4.3	3.8	3.9	3.1	4.1	13	13.4	9.8	6.4	11.5	10.3	12.1	10.7	11.2
pH (S.U.)	6.0 - 8.5	5.7	4.9	4.9	5.3	4.9	4.9	7.1	7.8	7.5	5.9	6.3	5.2	5.6	5.3	6.4	6	6.1	5.5	5.6	5.9	5.6	5.7	5.1	4.8	5.4
Specific Conductance (us/cm)	-	107	102	100	105	112	127	128	119	123	126	123	113	NS	117	118	109	119	111	112	123	118	102	148	139	138
Sulfate (mg/l)	250	2	2	2	2	2	NS	NS	NS	NS	NS	NS	NS	NS	NS	10	10	10	<10	<10	19.9	<10	<10	<1	<1	<1
Turbidity (NTU)	5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1.5	2.4	<1

MW-2 Metals Analytical Results

Parameter	GW* Standard	2-Mar 1995	15-May 1995	22-May 1995	31-May 1995	10-Oct 1995	3-Jun 1996	20-Nov 1996	3-Jun 1997	6-Oct 1997	8-Jun 1998	26-Oct 1998	28-Jun 1999	28-Sep 1999	19-Jun 2000	13-Nov 2000	18-Jun 2001	29-Oct 2001	17-Jun 2002	7-Oct 2002	14-Jul 2003	23-Feb 2004	15-Nov 2004	10-Aug 2005	27-Feb 2006	23-Aug 2006
Antimony (mg/l)	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic (mg/l)	0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005	<0.005
Barium (mg/l)	2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	35	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	0.03	0.027	0.026
Beryllium (mg/l)	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cadmium (mg/l)	0.005	<0.1	<0.05	<0.005	<0.005	<0.05	<0.05	<0.05	<0.1	<0.1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005
Calcium (mg/l)		18.6	10.9	8.2	11.4	9.5	5.8	12.9	16.1	3.9	11	3.4	4.4	4.37	3.71	3.22	18.3	9.15	9.63	8.48	19.6	9.62	9.68	9.4	9.4	9
Chromium (mg/l)	0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005
Cobalt (mg/l)	0.073	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Copper (mg/l)	1.3	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<5	<0.1	<0.1	<0.1	<0.1	0.14	<0.1	<0.1	6.45	<0.1	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005
Iron (mg/l)	1.4	<0.5	0.25	2.93	<0.05	3.16	1.65	<0.1	<0.5	<0.5	<0.5	0.73	3.1	0.65	<0.5	<0.5	2.5	<0.5	<0.5	<1	3.74	<0.5	<0.5	<0.1	0.21	<0.1
Lead (mg/l)	0.015	<0.5	<0.5	<0.05	<0.005	<0.5	<0.25	<0.25	<0.25	<0.25	<5	<0.25	<0.25	<0.25	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005
Magnesium (mg/l)		3.6	4.2	4	4.8	3.6	2.2	5	5.9	1.4	4.4	1.3	1.79	1.73	1.41	1.23	8	3.79	3.64	3.78	7.45	3.82	3.94	3.8	3.8	3.4
Manganese (mg/l)	0.043	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Mercury (mg/l)	0.002	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001
Nickel (mg/l)	0.039	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Potassium (mg/l)		4.4	2.7	2.88	2.5	3.1	2.4	4	3.03	1.8	2.6	1.4	2.03	1.49	1.79	1.69	3.6	2.17	2.32	2.12	4.48	2.31	2.53	2.5	2.3	2.1
Selenium (mg/l)	0.05	<0.05	<0.01	<0.01	<0.05	<0.025	<0.05	<0.05	<0.05	<0.05	<5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005	<0.005
Silver (mg/l)	0.0094	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sodium (mg/l)		5.7	5.7	7.5	8.9	5.2	7.2	6.6	7.6	5.4	6.7	4.8	5.34	5.43	5.2	4.48	16.3	6.86	6.45	6.27	5.76	6.23	6.61	5.8	5.5	5.1
Thallium (mg/l)	0.002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Vanadium (mg/l)	0.0086	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Zinc (mg/l)	0.6	<0.5	<0.5	0.13	<0.1	<0.05	<0.1	<0.1	<0.5	<0.5	26	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05

* Groundwater (GW) Standard based on EPA Maxiumum Contaminant Level, EPA Secondary Drinking Water Standard, or MDE Cleanup Standard for Type I/II Aquifers
NS = parameter not sampled; ND = result below detection limit; NA = not available or not sampled
J = Result is an approximate value that is less than the laboratory Reporting Limit (RL) but greater than or equal to the laboratory Method Detection Limit (MDL).

Continued on back

MW-2 Indicator Analytical Results

Parameter	GW* Standard	21-Feb 2007	22-Aug 2007	27-Feb 2008	20-Aug 2008	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
Alkalinity (mg/l)	-	<5	<5	<5	<5	<5	<5	3.5	3	4	3	5	5	4	4	3.6	6.2	3.3	4.5	3.9	1.5	1.6	2.7	2.2	2.2	1.1
Ammonia (mg/l)	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chemical Oxygen Demand (COD) (mg/l)	-	<20	<20	<20	<10	<20	<20	<10	<5	<5	<5	6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloride (mg/l)	250	8	7.7	7.4	7.2	7.7	6.2	8.2	7	10	7.5	8.6	7.6	7.1	5.4	6.6	<5	7.3	6	6.9	7.3	7.2	8.7	8.4	8.1	11
Dissolved Solids (mg/l)	500	108	116	90	117	120	60	120	94	80	74	73	58	87	59	74	35	67	41	67	63	80	98	70	77	110
Hardness (mg/l)	-	35	40	NS	33	35	31	39	37	37	29	34	28	30	30	28	39	29	25	29	29	30	31	30	31	40
Nitrate (mg/l)	10	9.3	10	10	10	10	8.8	12	8.6	8.8	6.9	7.3	6.2	7	4.7	5.4	2.4	6.6	5.6	7.1	6.6	6.9	8	7.8	7.7	11
pH (S.U.)	6.0 - 8.5	5.1	5.1	5.1	5	4.7	5.1	5	4.6	5	6.3	5	5.8	5.3	5.6	5.5	5.3	5.2	5.4	5.2	5.7	5.3	5.4	5.4	5.7	5.7
Specific Conductance (us/cm)	-	131	127	130	129	113	116	134	125	110	110	100	90	100	77	95	99	100	95	96	88	89	100	99	100	120
Sulfate (mg/l)	250	3.8	0.1	1.3	0.7	<2	3	0.3	0.7	0.4	2	<1	<5	<5	<5	<5	20	<5	<5	<5	<5	<5	<5	<5	<5	<5
Turbidity (NTU)	5	3	0.3	0.3	0.6	1.3	0.4	0.4	53	0.9	0.36	0.52	0.62	0.26	0.43	1.2	3.5	0.37	0.56	0.38	<0.5	<0.5	<0.5	<0.5	<0.5	0.57

MW-2 Metals Analytical Results

Parameter	GW* Standard	21-Feb 2007	22-Aug 2007	27-Feb 2008	20-Aug 2008	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
Antimony (mg/l)	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (mg/l)	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (mg/l)	2	0.027	0.027	0.025	0.027	0.025	0.021	0.028	0.025	0.026	0.02	0.024	0.018	0.02	0.023	0.019	0.043	0.022	0.0179	0.0215	0.0202	0.0209	0.0214	0.0214	0.0221	0.0264
Beryllium (mg/l)	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Calcium (mg/l)		8.9	10	7.9	7.9	8.8	7.5	10	9.2	9.5	7.5	8.5	7	7.5	7.8	7	9.3	7.3	6.4	7.05	7.54	7.28	7.57	7.64	7.41	10.7
Chromium (mg/l)	0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.0012	<0.001	0.0088	0.001	0.0011	0.0011	0.0011	0.0011	0.0018	0.0011	0.002	<0.001	0.0017	0.0012	0.0011	0.0011	0.0012	0.0012	0.0012	0.0011
Cobalt (mg/l)	0.073	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	J0.00076
Copper (mg/l)	1.3	<0.005	<0.005	<0.005	<0.005	<0.005	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0044
Iron (mg/l)	1.4	0.075	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.19	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead (mg/l)	0.015	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (mg/l)		3.2	3.5	3.3	3.2	3.1	3	3.4	3.4	3.2	2.6	3	2.5	2.7	2.6	2.5	3.9	2.7	2.23	2.69	2.57	2.81	2.93	2.64	3.11	3.29
Manganese (mg/l)	0.043	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0074	0.0078	0.0072	0.018	0.0082	0.008	0.0077	0.0069	0.0075	0.0089	0.0078	0.0106	0.0093
Mercury (mg/l)	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel (mg/l)	0.039	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0019	0.0016	0.0018	<0.001	0.0019	0.0021	0.0015	0.0017	0.0017	0.0017	0.0017	0.0018	0.0028
Potassium (mg/l)		2	2.2	2.1	2.2	2	1.9	2.2	2.4	2.2	2	2	1.8	1.8	1.9	1.7	1.7	1.8	1.73	1.95	1.86	2.05	2.02	1.89	2.1	2.01
Selenium (mg/l)	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver (mg/l)	0.0094	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sodium (mg/l)		3.9	4.8	4.6	4.7	4.6	4.1	5.3	4.7	5.1	4.5	4.9	4.4	3.9	3	3.3	3.3	3.4	2.88	4.32	3.6	2.76	4.23	3.97	3.93	4.27
Thallium (mg/l)	0.002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium (mg/l)	0.0086	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (mg/l)	0.6	<0.05	<0.05	<0.02	<0.02	<0.02	0.022	0.021	<0.02	<0.02	<0.02	0.023	<0.02	<0.02	0.055	<0.02	0.022	<0.02	0.0216	<0.02	0.0202	<0.02	0.0202	<0.02	<0.02	0.0227

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Appendix E. Summary of groundwater quality data (Indicator Parameters, Total Metals and VOCs), Dulin Rubble Landfill, Kent County, Maryland

MW-3 Indicator Analytical Results

Parameter	GW* Standard	2-Mar 1995	15-May 1995	22-May 1995	31-May 1995	10-Oct 1995	3-Jun 1996	20-Nov 1996	3-Jun 1997	6-Oct 1997	8-Jun 1998	26-Oct 1998	28-Jun 1999	28-Sep 1999	19-Jun 2000	13-Nov 2000	18-Jun 2001	29-Oct 2001	17-Jun 2002	7-Oct 2002	27-Feb 2006	23-Aug 2006	21-Feb 2007	22-Aug 2007	27-Feb 2008	20-Aug 2008
Alkalinity (mg/l)	-	4	4	4	3	4	5	6	4	6	5	6	6	10	5	4	6	82	NS	DRY	<5	<5	<5	5.5	<5	<5
Ammonia (mg/l)	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7	<0.2	DRY	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chemical Oxygen Demand (COD) (mg/l)	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	14	<10	DRY	<20	<20	<20	<20	<20	<10
Chloride (mg/l)	250	24	17	16	26	15	11	11	13	76	14	<10	<10	<10	<10	<10	<10	40	<10	DRY	6.5	8.6	8.2	8.2	6.5	8.9
Dissolved Solids (mg/l)	500	150	134	136	332	134	154	104	130	23	131	48	98	48	60	42	64	260	223	DRY	115	78	114	91	110	88
Hardness (mg/l)	-	35	40	37	142	57	56	18	48	23	32	16	43	23	68	16	25	152	18	DRY	59	41	44	38	NS	34
Nitrate (mg/l)	10	9.2	11.4	11.4	18.3	14.5	13.8	9	12	4.9	11.8	3.7	12.6	3.7	3.8	3.1	4.3	15.2	4.5	DRY	10.5	6.9	8.6	5.3	9.2	6.1
pH (S.U.)	6.0 - 8.5	5.7	4.9	4.9	4.7	4.9	5	7.2	7.6	7.4	6.2	6.4	5	5.7	5.6	5.8	5.8	5.8	5.5	DRY	4.8	5.1	5	4.8	4.8	5
Specific Conductance (us/cm)	-	106	106	113	114	119	123	109	117	125	109	121	110	NS	110	76	102	47	115	DRY	193	144	154	133	160	133
Sulfate (mg/l)	250	<2	<2	5.1	132	2	NS	NS	NS	NS	NS	NS	NS	NS	NS	10	10	65.6	71.3	DRY	20.9	17.8	17.9	15	26	18
Turbidity (NTU)	5	NS	78	5.9	25	105	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	3.4	<1	2	2.5	67	3.6

MW-3 Metals Analytical Results

Parameter	GW* Standard	2-Mar 1995	15-May 1995	22-May 1995	31-May 1995	10-Oct 1995	3-Jun 1996	20-Nov 1996	3-Jun 1997	6-Oct 1997	8-Jun 1998	26-Oct 1998	28-Jun 1999	28-Sep 1999	19-Jun 2000	13-Nov 2000	18-Jun 2001	29-Oct 2001	17-Jun 2002	7-Oct 2002	27-Feb 2006	23-Aug 2006	21-Feb 2007	22-Aug 2007	27-Feb 2008	20-Aug 2008
Antimony (mg/l)	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Arsenic (mg/l)	0.01	<0.05	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	DRY	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium (mg/l)	2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	33	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	DRY	0.064	0.053	0.053	0.043	0.061	0.049
Beryllium (mg/l)	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Cadmium (mg/l)	0.005	<0.1	<0.05	<0.005	0.0005	<0.05	<0.05	<0.05	<0.1	<0.1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	DRY	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003
Calcium (mg/l)		14	<0.05	7.9	15.8	10.6	11.2	10.4	15.4	3.5	8.5	3.8	<0.1	<0.1	<0.1	55.8	3.5	<0.1	3.59	DRY	13	9.8	11	8.6	11	6.8
Chromium (mg/l)	0.1	0.29	0.5	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	8.5	<0.1	<0.1	<0.1	<0.1	<0.12	<0.1	<0.1	<0.1	DRY	<0.005	<0.005	<0.005	<0.005	0.015	<0.005
Cobalt (mg/l)	0.073	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Copper (mg/l)	1.3	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	DRY	<0.005	<0.005	<0.005	0.05	<0.005	0.078
Iron (mg/l)	1.4	59.6	7.34	1.33	0.79	6.06	0.36	<0.1	<0.5	<0.5	<0.5	5.85	1	4.86	<0.5	19.6	2.04	11.5	<0.5	DRY	0.29	0.3	0.11	0.14	3.4	<0.1
Lead (mg/l)	0.015	<0.5	0.5	<0.05	0.012	<0.5	0.25	<0.25	<0.25	<0.25	<5	<0.25	<0.25	<0.25	<0.1	<0.1	<0.1	<0.1	<0.1	DRY	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium (mg/l)		7.7	4.4	3.9	9	5.1	4.4	4.4	5.7	1.4	3.5	1.7	4.07	5.34	3.9	22.6	1.76	16	1.3	DRY	6.4	4.1	4.2	4.1	6.3	4.2
Manganese (mg/l)	0.043	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Mercury (mg/l)	0.002	<0.0002	<0.0005	<0.0005	<0.005	<0.005	<0.1	<0.002	<0.1	<0.1	<5	<0.002	NS	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	DRY	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel (mg/l)	0.039	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Potassium (mg/l)		17.8	4.5	2.22	1.8	4.5	1.8	3.7	2.57	2.1	1.8	2.6	2.47	3.93	2.4	7.62	2.12	6.83	1.74	DRY	2.1	2.8	1.9	1.6	2.2	1.6
Selenium (mg/l)	0.05	<0.05	<0.01	<0.1	<0.05	<0.025	<0.05	<0.05	<0.05	<0.05	<5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	DRY	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silver (mg/l)	0.0094	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Sodium (mg/l)		6.7	6.7	7.9	20.9	6.8	6.3	6.7	7.2	5.4	<5	4.6	6.6	8.6	6.9	22.6	5.36	25	5.01	DRY	4.3	4.4	3.7	4.4	4.4	4
Thallium (mg/l)	0.002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Vanadium (mg/l)	0.0086	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Zinc (mg/l)	0.6	<0.5	<0.5	0.69	0.23	<0.05	0.81	<0.01	<0.5	<0.5	26	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	DRY	<0.05	<0.05	<0.05	0.082	0.036	0.022

* Groundwater (GW) Standard based on EPA Maxiumum Contaminant Level, EPA Secondary Drinking Water Standard, or MDE Cleanup Standard for Type I/II Aquifers
NS = parameter not sampled; ND = result below detection limit; NA = not available or not sampled
J = Result is an approximate value that is less than the laboratory Reporting Limit (RL) but greater than or equal to the laboratory Method Detection Limit (MDL).

Continued on back

MW-3 Indicator Analytical Results

Parameter	GW* Standard	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
Alkalinity (mg/l)	-	<5	<5	6	6	4	6	6	6	6	6	6.3	3.6	5.9	5.6	5.6	1.8	3.4	3	11	4.4	2.5
Ammonia (mg/l)	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chemical Oxygen Demand (COD) (mg/l)	-	<20	<20	<10	<5	<5	<5	<5	<5	<5	<5	6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloride (mg/l)	250	9.4	2.4	4.3	2.9	7.5	6.3	6.9	<5	5.2	<5	<5	6.6	<5	<5	5.7	12	<5	<5	6.8	<5	14
Dissolved Solids (mg/l)	500	110	130	89	87	110	92	59	90	80	170	71	10	61	40	110	92	130	100	110	83	87
Hardness (mg/l)	-	42	73	30	56	38	40	40	52	36	51	30	29	33	45	44	26	49	55	47	40	42
Nitrate (mg/l)	10	7.7	18	2.5	8	4.8	4.1	3.7	7.7	3.9	8.3	2.5	5.3	2.4	5.9	7.4	5.8	10	12	9	6.5	5.2
pH (S.U.)	6.0 - 8.5	4.6	5	5	4.8	5	6.4	4.7	5.9	5.3	5.6	5.5	5.3	5.2	5.3	5.2	5.5	5.2	5.3	5.3	5.9	5.4
Specific Conductance (us/cm)	-	119	89.1	101	152	110	120	110	130	110	140	100	84	100	130	140	130	140	140	140	120	130
Sulfate (mg/l)	250	13	19	20	16	17	22	19	15	14	18	11	<5	15	20	15	13	16	17	14	17	12
Turbidity (NTU)	5	46	2.2	6.4	3.7	40	4.9	46	36	4.9	100	5.4	0.35	4.8	2.7	2.2	17	3	17	2.1	1.6	1.2

MW-3 Metals Analytical Results

Parameter	GW* Standard	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
Antimony (mg/l)	0.006	NS	NS	NS	NS	NS	NS	NS	NS	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (mg/l)	0.01	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.0021	<0.001	<0.001	0.0028	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (mg/l)	2	0.055	0.072	0.036	0.049	0.041	0.046	0.055	0.061	0.044	0.079	0.041	0.02	0.05	0.0471	0.0735	0.052	0.0713	0.0775	0.0703	0.0551	0.0521
Beryllium (mg/l)	0.004	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Calcium (mg/l)		8.4	18	7.2	13	8.5	9.5	8	11	7.7	11	7	7.3	7.4	10.9	10.3	10.5	10.5	12.9	10.9	9.73	10.2
Chromium (mg/l)	0.1	0.014	0.001	0.0023	0.002	0.0089	0.0024	0.023	0.0091	0.0039	0.029	0.0028	0.0013	0.0028	0.0015	0.0016	0.005	0.0019	0.005	0.0019	<0.001	0.0014
Cobalt (mg/l)	0.073	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	0.0013	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001	<0.001	J0.00059
Copper (mg/l)	1.3	<0.005	<0.001	<0.001	<0.001	0.012	<0.001	0.0018	0.0013	<0.001	0.0015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (mg/l)	1.4	3.3	<0.1	0.24	0.24	1.6	0.32	5	2.2	0.58	7.3	0.53	<0.1	0.34	0.116	0.164	0.973	0.225	1.04	0.184	<0.1	J0.0354
Lead (mg/l)	0.015	<0.005	<0.001	<0.001	<0.001	0.0026	<0.001	0.0018	<0.001	<0.001	0.0018	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (mg/l)		5.2	6.8	2.8	5.8	4	3.9	4.9	6	4.1	5.7	3.1	2.7	3.6	4.42	4.47	6.44	5.58	5.59	4.72	3.78	4.09
Manganese (mg/l)	0.043	NS	NS	NS	NS	NS	NS	NS	NS	0.024	0.046	0.017	0.0081	0.026	0.0222	0.0355	0.0335	0.0322	0.0289	0.0262	0.0202	0.023
Mercury (mg/l)	0.002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel (mg/l)	0.039	NS	NS	NS	NS	NS	NS	NS	NS	0.0021	0.0033	0.0013	<0.001	0.0016	0.0015	0.0016	0.0032	0.0024	0.002	0.0021	0.001	0.002
Potassium (mg/l)		2.1	2.5	1.8	1.7	2.1	2.1	2.1	1.9	1.6	2.8	2	2	2.7	1.71	2.89	1.74	2.77	2.28	2.58	2.2	2
Selenium (mg/l)	0.05	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver (mg/l)	0.0094	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sodium (mg/l)		4.1	4.2	3.4	3.7	4.2	3.9	4.1	3.8	3.6	3.6	3.4	3.6	3.8	3.16	4.13	3.74	3.3	3.4	4.15	3.34	4.02
Thallium (mg/l)	0.002	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium (mg/l)	0.0086	NS	NS	NS	NS	NS	NS	NS	NS	0.0019	0.027	0.0017	<0.001	0.0013	<0.001	<0.001	0.0031	<0.001	0.0036	<0.001	<0.001	J0.00031
Zinc (mg/l)	0.6	0.02	0.032	<0.02	<0.02	0.077	0.024	0.042	0.035	<0.02	0.033	0.022	0.023	0.038	0.0223	0.0311	0.0306	0.0258	0.0378	0.0272	0.0566	0.0343

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Appendix E. Summary of groundwater quality data (Indicator Parameters, Total Metals and VOCs), Dulin Rubble Landfill, Kent County, Maryland

MW-4 Indicator Analytical Results

Parameter	GW* Standard	2-Mar 1995	15-May 1995	22-May 1995	31-May 1995	10-Oct 1995	3-Jun 1996	20-Nov 1996	3-Jun 1997	6-Oct 1997	26-Oct 1998	28-Jun 1999	28-Sep 1999	19-Jun 2000	13-Nov 2000	18-Jun 2001	29-Oct 2001	17-Jun 2002	7-Oct 2002	14-Jul 2003	23-Feb 2004	15-Nov 2004	10-Aug 2005	27-Feb 2006	23-Aug 2006	21-Feb 2007
Alkalinity (mg/l)	-	5	6	6	5	5	5	5	4	2	3	4	168	4	3	43	NA	c	3	42	4	7	<5	<5	<5	<5
Ammonia (mg/l)	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	NA	<0.2	err	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chemical Oxygen Demand (COD) (mg/l)	-	<10	<10	<10	10	<10	<10	<10	<10	10	<10	<10	13	<10	<10	<10	NA	<10	<10	<10	<10	<10	<20	<20	<20	<20
Chloride (mg/l)	250	19	17	14	15	14	7	14	15	15	14	15	29	18	18	1	NA	2.5	26	<10	27	29	29.9	32.9	23.9	28
Dissolved Solids (mg/l)	500	85	104	106	108	98	78	114	144	128	156	166	304	205	205	166	NA	297	86	112	254	268	255	217	136	215
Hardness (mg/l)	-	25	26	16	29	32	22	36	41	46	59	61	184	150	150	80	NA	132	141	50	134	39	97	86	70	68
Nitrate (mg/l)	10	7.5	8.2	7.8	7.8	7.9	5.6	11	12.2	13.6	16.5	19	4.4	19.5	19.5	6.2	NA	31	34.8	6.3	31.3	26.8	21.9	17.6	13.4	18.1
pH (S.U.)	6.0 - 8.5	5.1	5.1	5	5.1	4.9	5.3	6.4	8.1	7.7	5.8	5.3	5.5	5.4	6.1	5.9	NA	5.4	5.5	5.7	5.9	5.7	5	4.8	5.4	4.9
Specific Conductance (us/cm)	-	610	920	920	93	100	62	90	94	99	174	173	NS	179	214	193	NA	175	330	157	186	149	316	283	227	256
Sulfate (mg/l)	250	<2	2.6	2.7	2	2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	<10	19.4	<10	<10	<1	<1	<1	<1
Turbidity (NTU)	5	NS	1100	NS	3.5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	3.2	10.9	10.8	0.7

MW-4 Metals Analytical Results

Parameter	GW* Standard	2-Mar 1995	15-May 1995	22-May 1995	31-May 1995	10-Oct 1995	3-Jun 1996	20-Nov 1996	3-Jun 1997	6-Oct 1997	26-Oct 1998	28-Jun 1999	28-Sep 1999	19-Jun 2000	13-Nov 2000	18-Jun 2001	29-Oct 2001	17-Jun 2002	7-Oct 2002	14-Jul 2003	23-Feb 2004	15-Nov 2004	10-Aug 2005	27-Feb 2006	23-Aug 2006	21-Feb 2007
Antimony (mg/l)	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic (mg/l)	0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005	0.0051	<0.005
Barium (mg/l)	2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NA	<0.5	0.5	<0.5	<0.05	<0.05	0.074	0.062	0.058	0.051
Beryllium (mg/l)	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cadmium (mg/l)	0.005	<0.1	<0.05	<0.0005	<0.05	<0.05	<0.05	<0.05	<0.1	0.1	<0.1	<0.1	<0.1	0.01	<0.5	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005	<0.003
Calcium (mg/l)		10.6	6.1	4.8	10.7	15.7	4.1	8.1	11.6	11.2	16.4	18.1	52.1	17.4	222	16.9	NA	31.4	38.1	19.6	26.1	33.8	26	23	18	20
Chromium (mg/l)	0.1	<0.23	<0.05	0.07	0.08	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<0.1	NA	<0.1	0.1	<0.1	<0.1	<0.1	<0.005	<0.005	0.065	<0.005
Cobalt (mg/l)	0.073	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS
Copper (mg/l)	1.3	<0.1	<0.05	<0.05	<0.05	<0.05	0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005	<0.005
Iron (mg/l)	1.4	88.5	6.88	30.47	33.95	5.11	1.98	0.1	3.17	<0.5	<0.5	4.62	6.6	2.02	2	1.35	NA	6.64	33.4	5.74	1.7	0.55	0.19	1.6	32	0.093
Lead (mg/l)	0.015	<0.5	<0.5	<0.5	0.027	<0.5	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005	<0.005
Magnesium (mg/l)		6.1	2.6	2.7	6	5.7	1.3	2.1	3.2	2.9	4.2	5.06	17.5	4.91	6.23	7.75	NA	8.89	11.7	7.58	7.36	7.63	7.7	7	5.9	4.7
Manganese (mg/l)	0.043	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS
Mercury (mg/l)	0.002	<0.1	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.1	<0.1	<0.0002	<0.002	NA	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001
Nickel (mg/l)	0.039	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS
Potassium (mg/l)		15.6	4	6.43	6.6	3.7	1.5	3.5	3.18	2.7	2.5	2.94	7.38	3.35	3.34	3.46	NA	4.47	8.02	4.89	4.42	4.98	3.4	3.3	5.6	2.5
Selenium (mg/l)	0.05	<0.05	<0.01	<0.01	<0.05	<0.0005	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005	<0.005	<0.005
Silver (mg/l)	0.0094	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sodium (mg/l)		7.9	7.3	8.9	14.9	8.3	5.8	8.1	11.9	10.6	9.4	9.1	18.5	9.69	10.6	16.2	NA	8.63	7.58	5.92	9.39	7.72	9	11	12	10
Thallium (mg/l)	0.002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS
Vanadium (mg/l)	0.0086	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS
Zinc (mg/l)	0.6	<0.5	<0.5	0.1	<0.1	<0.05	0.07	<0.1	<0.05	0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	0.095	<0.05

* Groundwater (GW) Standard based on EPA Maxiumum Contaminant Level, EPA Secondary Drinking Water Standard, or MDE Cleanup Standard for Type I/II Aquifers
NS = parameter not sampled; ND = result below detection limit; NA = not available or not sampled
J = Result is an approximate value that is less than the laboratory Reporting Limit (RL) but greater than or equal to the laboratory Method Detection Limit (MDL).

Continued on back

Appendix E. Summary of groundwater quality data (Indicator Parameters, Total Metals and VOCs), Dulin Rubble Landfill, Kent County, Maryland

MW-4 Indicator Analytical Results

Parameter	GW* Standard	22-Aug 2007	27-Feb 2008	20-Aug 2008	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
Alkalinity (mg/l)	-	<5	<5	7	113	<5	6.5	6	9	9	8	5	8	3	5.2	5.4	5.4	4.9	5.8	2.8	3.7	2.5	2.2	1.1	3.2
Ammonia (mg/l)	-	<0.2	<0.2	0.38	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chemical Oxygen Demand (COD) (mg/l)	-	<20	<20	26	<20	<20	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5	<5	<5	<5	<5
Chloride (mg/l)	250	25	24	25	21	12	23	19	23	22	20	16	17	12	16	17	15	11	13	13	12	10	11	10	14
Dissolved Solids (mg/l)	500	266	190	272	200	81	230	120	160	150	170	110	160	96	140	96	130	79	110	92	110	94	110	99	82
Hardness (mg/l)	-	91	NS	73	67	38	82	70	68	73	73	50	55	44	52	52	51	40	42	45	38	38	39	37	41
Nitrate (mg/l)	10	19	18	19	18	14	21	16	16	16	14	9.6	12	11	10	9.7	8.9	8.5	9.7	7.7	8.6	11	9.7	10	7.1
pH (S.U.)	6.0 - 8.5	4.7	4.6	4.9	4.6	5	4.8	4.6	5.3	6.5	4.7	6	5.1	5.4	5.2	5	4.9	5.1	5	6.2	5.1	5.2	5.2	5.5	5.4
Specific Conductance (us/cm)	-	283	240	280	194	173	267	243	210	250	210	160	180	150	180	160	170	150	150	130	120	130	130	130	120
Sulfate (mg/l)	250	0.5	<0.1	0.4	<0.2	0.3	<0.2	<0.2	0.4	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Turbidity (NTU)	5	2	1.7	1700	31	2	2.3	2.9	1.8	1.5	2.9	4.5	0.5	0.47	1.3	0.66	0.37	1	0.47	1.6	<0.5	0.71	0.77	<0.5	0.65

MW-4 Metals Analytical Results

Parameter	GW* Standard	22-Aug 2007	27-Feb 2008	20-Aug 2008	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
Antimony (mg/l)	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (mg/l)	0.01	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (mg/l)	2	0.061	0.051	0.094	0.056	0.028	0.078	0.066	0.066	0.065	0.068	0.041	0.051	0.038	0.051	0.05	0.053	0.0307	0.0399	0.041	0.0359	0.0299	0.0308	0.0278	0.0362
Beryllium (mg/l)	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	J0.00025
Cadmium (mg/l)	0.005	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Calcium (mg/l)		25	19	19	18	10	22	19	20	20	20	14	15	12	14	14	14	11.1	11.5	11.9	10.5	10.3	10.7	9.68	11.8
Chromium (mg/l)	0.1	<0.005	<0.005	0.005	<0.005	0.0016	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0011	0.0016	J0.00082
Cobalt (mg/l)	0.073	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0037	0.0013	0.0043	0.0037	0.0048	0.0016	0.0021	0.0025	0.0017	<0.001	0.0012	<0.001	0.0024
Copper (mg/l)	1.3	<0.005	0.013	0.056	<0.005	0.0025	0.0025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0034
Iron (mg/l)	1.4	<0.1	0.12	0.44	1.7	0.11	<0.1	<0.1	<0.1	<0.1	<0.1	0.15	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.168	<0.1	<0.1	J0.0464
Lead (mg/l)	0.015	<0.005	<0.005	0.0075	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (mg/l)		6.7	5.2	5.9	5.1	3.2	6.4	5.3	4.7	5.6	5.6	3.6	4.2	3.4	4.1	4.2	3.9	3.03	3.34	3.67	2.87	3.09	2.93	3.05	2.72
Manganese (mg/l)	0.043	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.2	0.064	0.21	0.19	0.22	0.0698	0.0973	0.146	0.0953	0.0411	0.0593	0.0302	0.137
Mercury (mg/l)	0.002	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel (mg/l)	0.039	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0018	0.0022	0.0019	<0.001	0.0019	0.0019	0.0019	0.0015	0.0015	0.002	0.002	0.0022	0.0026
Potassium (mg/l)		3.1	2.8	2.9	2.8	2.2	2.6	2.8	2.8	2.7	2.7	2.3	2.4	2.4	2.4	2.7	2.6	1.95	2.27	2.23	2.38	2.29	2.16	2.24	1.91
Selenium (mg/l)	0.05	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver (mg/l)	0.0094	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sodium (mg/l)		10	11	9.2	9.5	12	8.5	10	4.8	8.7	8	8.7	6.4	8.2	6.8	6	5.5	5.55	5.91	4.47	4.01	6.03	5.25	5.64	3.26
Thallium (mg/l)	0.002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium (mg/l)	0.0086	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	J0.00014
Zinc (mg/l)	0.6	<0.05	0.037	0.07	0.021	0.041	0.028	<0.02	<0.02	0.023	<0.02	<0.02	<0.02	0.029	0.026	0.027	0.026	0.0211	0.0255	<0.02	0.0203	0.0249	0.023	0.0231	0.0213

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Appendix E. Summary of groundwater quality data (Indicator Parameters, Total Metals and VOCs), Dulin Rubble Landfill, Kent County, Maryland

MW-5 Indicator Analytical Results

Parameter	GW* Standard	2-Mar 1995	15-May 1995	22-May 1995	31-May 1995	10-Oct 1995	4-Jun 1996	20-Nov 1996	3-Jun 1997	6-Oct 1997	8-Jun 1998	26-Oct 1998	28-Jun 1999	28-Sep 1999	19-Jun 2000	13-Nov 2000	18-Jun 2001	29-Oct 2001	17-Jun 2002	7-Oct 2002	14-Jul 2003	23-Feb 2004	15-Nov 2004	10-Aug 2005	27-Feb 2006	23-Aug 2006
Alkalinity (mg/l)	-	2	2	2	2	3	49	8	47	81	165	100	54	160	84	122	38	82	NS	DRY	42	48	39	28	30.5	30
Ammonia (mg/l)	-	<0.2	<0.2	<0.2	<0.2	<0.2	0.5	<0.2	0.2	0.7	0.8	0.5	0.4	1	1.6	0.5	0.3	0.7	0.5	DRY	0.3	<0.2	<0.2	0.2	0.42	0.21
Chemical Oxygen Demand (COD) (mg/l)	-	<10	<10	<10	<10	<10	39	22	800	61	28	27	208	64	280	26	10	10	<10	DRY	<10	<10	<10	<20	<20	<20
Chloride (mg/l)	250	23	26	25	27	29	134	21	31	86	57	78	15	30	33	42	10	39	<10	DRY	<10	<10	38	8.6	7.3	6.3
Dissolved Solids (mg/l)	500	426	360	324	356	280	892	162	136	628	448	474	142	308	236	346	162	258	218	DRY	112	112	112	101	91	106
Hardness (mg/l)	-	165	143	134	148	133	460	32	34	300	238	256	69	244	30	212	94	166	134	DRY	49	86	123	62	55	47
Nitrate (mg/l)	10	17.2	20	19	18.3	16.8	5.6	11.7	<0.2	6.7	10.6	6.3	0.4	4.7	3.9	4	6.6	2.9	5	DRY	6.2	5.8	6.9	7.4	4.4	3.5
pH (S.U.)	6.0 - 8.5	4.6	4.5	4.9	4.4	4.6	5.2	5.6	7.4	7.2	NS	6.7	6.1	5.9	5.9	6	5.9	5.9	5.6	DRY	5.8	5.9	5.8	5.8	5.5	6
Specific Conductance (us/cm)	-	572	510	493	265	395	1096	687	325	745	NS	655	426	NS	310	462	223	260	421	DRY	155	184	134	176	155	143
Sulfate (mg/l)	250	184.6	139	123	142.9	92	NS	NS	NS	NS	NS	NS	NS	NS	NS	73.4	34.3	64	68.2	DRY	18.9	12.5	<10	6.9	8	8.4
Turbidity (NTU)	5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	0.7	33.1	1.5

MW-5 Metals Analytical Results

Parameter	GW* Standard	2-Mar 1995	15-May 1995	22-May 1995	31-May 1995	10-Oct 1995	4-Jun 1996	20-Nov 1996	3-Jun 1997	6-Oct 1997	8-Jun 1998	26-Oct 1998	28-Jun 1999	28-Sep 1999	19-Jun 2000	13-Nov 2000	18-Jun 2001	29-Oct 2001	17-Jun 2002	7-Oct 2002	14-Jul 2003	23-Feb 2004	15-Nov 2004	10-Aug 2005	27-Feb 2006	23-Aug 2006
Antimony (mg/l)	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Arsenic (mg/l)	0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	DRY	<0.05	<0.05	<0.05	<0.005	<0.005	<0.005
Barium (mg/l)	2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	DRY	<0.5	<0.05	<0.05	0.034	0.024	0.023
Beryllium (mg/l)	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Cadmium (mg/l)	0.005	<0.1	<0.05	<0.0005	<0.005	<0.05	<0.05	<0.05	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	DRY	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005
Calcium (mg/l)		53.9	27.8	23.6	4.6	29.8	88.9	42.5	6.5	66.2	60.5	60.5	29.5	60.9	38.9	55.6	26.5	43	34.1	DRY	19.8	17.8	17.4	14	13	11
Chromium (mg/l)	0.1	0.11	0.06	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.39	DRY	<0.1	<0.1	<0.1	0.0066	0.0059	0.016
Cobalt (mg/l)	0.073	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Copper (mg/l)	1.3	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	DRY	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005
Iron (mg/l)	1.4	23.5	14.7	8.83	3.48	7.67	0.38	10.3	9.71	7.1	2.3	2.6	13.2	2.05	0.88	3.12	1.68	4.34	84.6	DRY	<0.5	1.1	4.81	<0.1	0.23	2.8
Lead (mg/l)	0.015	0.05	<0.5	0.065	0.024	<0.5	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.1	<0.1	<0.1	<0.1	<0.1	DRY	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005
Magnesium (mg/l)		14.3	14.8	14.1	2.8	15.8	38.7	21.6	3.8	29.4	24.6	38.7	9.93	18.7	13.6	21.5	7.58	16.1	17.4	DRY	7.34	7.13	7.15	6.5	5.3	4.5
Manganese (mg/l)	0.043	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Mercury (mg/l)	0.002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.002	NS	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	DRY	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001
Nickel (mg/l)	0.039	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Potassium (mg/l)		10.7	10.5	6.72	3.6	9.5	6.4	11.6	1.8	9.1	5.8	6.4	3.68	7.71	5.51	5.34	3.42	5.61	19.4	DRY	3.89	3.22	4.48	3.2	3.1	3.2
Selenium (mg/l)	0.05	<0.05	<0.01	<0.01	<0.05	<0.025	<0.25	<0.05	<0.05	<0.05	<0.05	<0.05	NS	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	DRY	<0.05	<0.05	<0.05	<0.005	<0.005	<0.005
Silver (mg/l)	0.0094	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Sodium (mg/l)		4.94	32.9	35.8	8.8	29.4	107.7	5.82	23.9	23.9	48	48	14.5	7.71	11.2	22.6	17.6	25.5	22.2	DRY	5.89	4.26	4.73	4	3.6	3.3
Thallium (mg/l)	0.002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Vanadium (mg/l)	0.0086	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DRY	NS	NS	NS	NS	NS	NS
Zinc (mg/l)	0.6	0.19	<0.5	0.19	<0.1	0.16	0.5	0.17	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	DRY	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05

* Groundwater (GW) Standard based on EPA Maxiumum Contaminant Level, EPA Secondary Drinking Water Standard, or MDE Cleanup Standard for Type I/II Aquifers
NS = parameter not sampled; ND = result below detection limit; NA = not available or not sampled
J = Result is an approximate value that is less than the laboratory Reporting Limit (RL) but greater than or equal to the laboratory Method Detection Limit (MDL).

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MW-5 Indicator Analytical Results

Parameter	GW* Standard	21-Feb 2007	22-Aug 2007	26-Feb 2008	20-Aug 2008	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
Alkalinity (mg/l)	-	27	20.5	22.5	20	5	19	18	16	17	13	17	18	18	13	15	14.9	14.9	12.8	13.3	12	10	14	12	7.7	9.2
Ammonia (mg/l)	-	<0.2	<0.2	<0.2	0.23	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chemical Oxygen Demand (COD) (mg/l)	-	<20	<20	<20	10	<20	<20	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloride (mg/l)	250	7.1	7.8	6.3	6.4	4.4	5.3	5.3	4	5.6	4.8	4.2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5.6	<5	<5	J4.5
Dissolved Solids (mg/l)	500	91	83	86	87	75	94	93	76	53	90	19	<10	62	39	43	30	29	<10	52	48	79	41	69	46	54
Hardness (mg/l)	-	40	46	NS	34	34	38	31	33	30	28	28	27	24	26	21	22	22	20	24	22	25	25	24	23	25
Nitrate (mg/l)	10	4.6	4.4	4.5	4.9	4.3	5.5	4.4	3	3	3.2	2.8	3	2.4	2.5	1.3	1.7	1.3	1.7	3.4	2.8	3.2	3.8	4.1	4.5	4.7
pH (S.U.)	6.0 - 8.5	5.5	5.7	5.1	5.4	5.2	5.6	5.3	5.3	6.4	6.8	5.2	6.4	5.6	5.8	5.8	5.6	5.6	5.6	5.6	6.6	5.6	5.5	5.7	6	5.9
Specific Conductance (us/cm)	-	132	132	122	113	92.9	119	103	94.3	79	92	80	80	74	71	67	61	64	68	79	72	73	43	76	75	82
Sulfate (mg/l)	250	6	5.7	5	5.2	4	4.5	3.4	1.9	3.1	4.1	2.7	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Turbidity (NTU)	5	0.2	0.9	2.5	6.3	1	1.2	6.1	12	2.8	1.7	2.4	3.1	1.1	1	1.5	1.9	1.7	2.2	2.5	3.8	2.3	1.1	2.4	1	1.7

MW-5 Metals Analytical Results

Parameter	GW* Standard	21-Feb 2007	22-Aug 2007	26-Feb 2008	20-Aug 2008	11-Aug 2009	22-Mar 2010	17-Aug 2010	22-Feb 2011	10-Aug 2011	29-Feb 2012	14-Aug 2012	19-Feb 2013	15-Aug 2013	25-Feb 2014	26-Aug 2014	23-Feb 2015	19-Aug 2015	22-Feb 2016	6-Sep 2016	6-Mar 2017	8-Aug 2017	26-Feb 2018	29-Aug 2018	25-Feb 2019	26-Aug 2019
Antimony (mg/l)	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (mg/l)	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (mg/l)	2	0.022	0.022	0.021	0.021	0.017	0.018	0.028	0.061	0.015	0.014	0.015	0.013	0.013	0.015	0.012	0.013	0.011	0.01	0.0128	0.0125	0.0154	0.0138	0.0145	0.0146	0.0151
Beryllium (mg/l)	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium (mg/l)	0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.001	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Calcium (mg/l)		9.5	11	9.8	7.6	8.3	9.2	4	7.8	7.1	6.7	6.4	6.7	5.7	6.3	4.8	5	5	4.88	5.5	4.88	5.48	5.84	5.66	4.85	6.04
Chromium (mg/l)	0.1	<0.005	0.005	<0.005	0.0054	<0.005	0.0038	<0.005	0.0067	0.0034	0.0038	0.0046	0.0044	0.0039	0.0035	0.0035	0.0044	0.0045	0.0038	0.0046	0.0043	0.004	0.0035	0.0047	0.0034	0.0033
Cobalt (mg/l)	0.073	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0013	0.0013	0.0013	0.0012	0.0011	0.0012	0.0013	0.0012	0.0013	0.0012	0.0012	0.0012	0.0012
Copper (mg/l)	1.3	<0.005	<0.005	<0.005	0.0094	<0.005	0.0055	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (mg/l)	1.4	0.015	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.51	<0.1	<0.1	<0.1	0.16	<0.1	<0.1	<0.1	0.13	0.11	0.109	0.195	0.235	0.203	<0.1	0.295	<0.1	J0.0402
Lead (mg/l)	0.015	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (mg/l)		3.8	4.5	4.2	3.6	3.3	3.6	1.7	3.3	3	2.8	2.9	2.5	2.4	2.4	2.1	2.3	2.2	1.92	2.45	2.4	2.64	2.56	2.5	2.67	2.47
Manganese (mg/l)	0.043	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.06	0.084	0.057	0.052	0.052	0.0499	0.0549	0.0521	0.0566	0.0537	0.0564	0.0647	0.0591
Mercury (mg/l)	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel (mg/l)	0.039	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0016	0.0017	0.0014	<0.001	0.0013	0.0015	0.0015	0.0017	0.002	0.0019	0.002	0.0021	0.0019
Potassium (mg/l)		2.4	2.8	2.8	2.2	2.3	2.8	1.9	2.6	2.4	2.3	2.2	2.1	2.1	2.3	2	2.2	2.2	1.83	2.27	2.06	2.46	2.32	2.23	2.15	2.04
Selenium (mg/l)	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver (mg/l)	0.0094	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sodium (mg/l)		2.8	3.6	3.6	3.3	3.1	3.5	5.5	3.4	3.6	3.4	3.5	2.9	2.9	2.7	2.3	2.6	2.5	2.18	3.04	2.5	2.78	2.88	2.87	3.16	2.93
Thallium (mg/l)	0.002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium (mg/l)	0.0086	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	J0.00017
Zinc (mg/l)	0.6	<0.05	<0.05	0.024	0.038	0.024	0.031	<0.02	0.033	<0.02	0.023	0.026	<0.02	0.021	0.026	0.023	0.026	0.021	0.0203	0.0246	0.0235	0.0266	0.0236	0.0235	0.0211	0.0248

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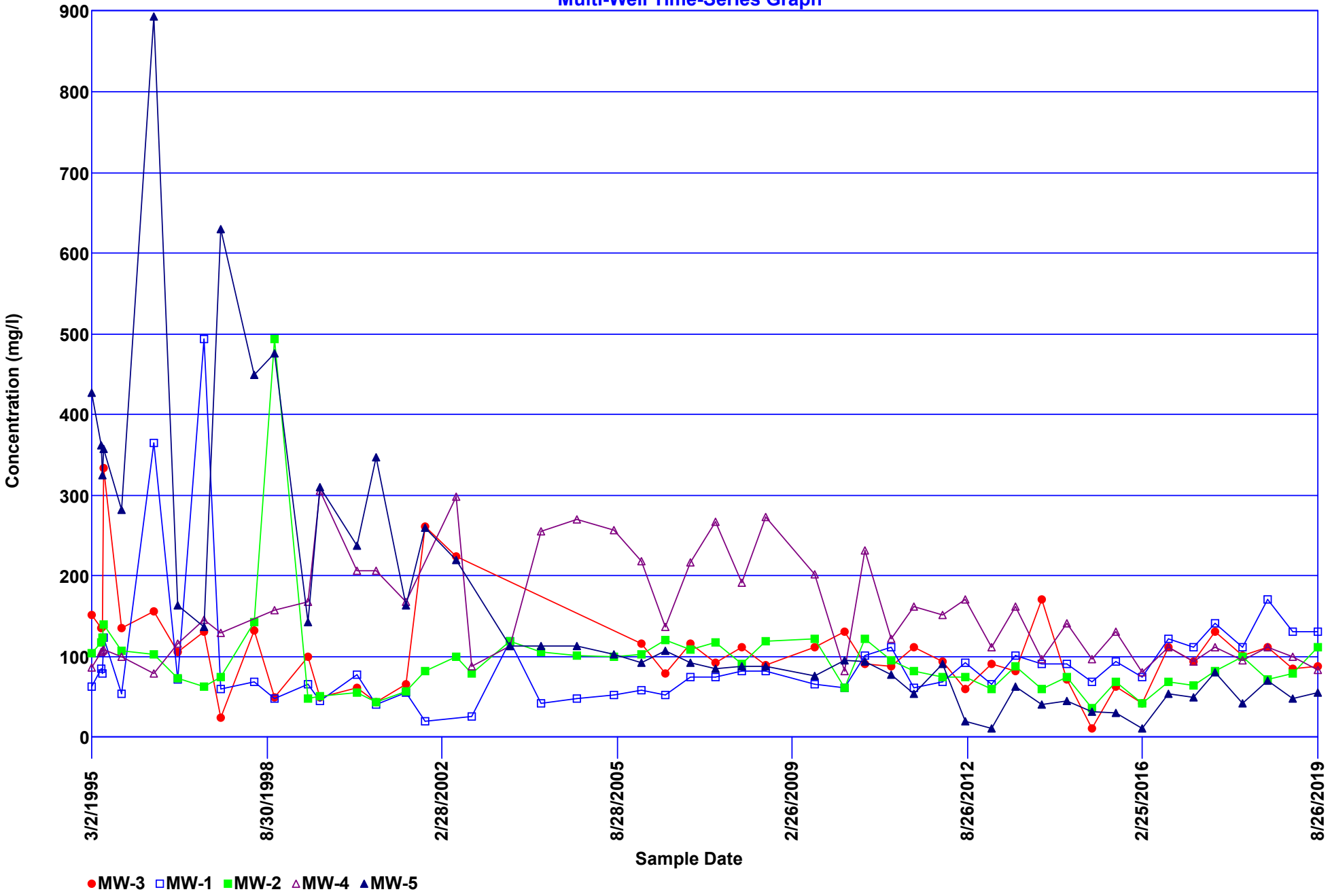
Appendix E. Summary of groundwater quality data (Indicator Parameters, Total Metals and VOCs), Dulin Rubble Landfill, Kent County, Maryland

APPENDIX F

Statistical Analysis Report

Dissolved Solids

Multi-Well Time-Series Graph



Mann-Kendall Trend Analysis

Parameter: Dissolved Solids

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
134	150	-16	0	1
136	150	-14	0	2
332	150	182	1	2
134	150	-16	1	3
154	150	4	2	3
104	150	-46	2	4
130	150	-20	2	5
23	150	-127	2	6
131	150	-19	2	7
48	150	-102	2	8
98	150	-52	2	9
48	150	-102	2	10
60	150	-90	2	11
42	150	-108	2	12
64	150	-86	2	13
260	150	110	3	13
223	150	73	4	13
115	150	-35	4	14
78	150	-72	4	15
114	150	-36	4	16
91	150	-59	4	17
110	150	-40	4	18
88	150	-62	4	19
110	150	-40	4	20
130	150	-20	4	21
89	150	-61	4	22
87	150	-63	4	23
110	150	-40	4	24
92	150	-58	4	25
59	150	-91	4	26
90	150	-60	4	27
80	150	-70	4	28
170	150	20	5	28
71	150	-79	5	29
10	150	-140	5	30
61	150	-89	5	31
40	150	-110	5	32
110	150	-40	5	33
92	150	-58	5	34
130	150	-20	5	35
100	150	-50	5	36
110	150	-40	5	37
83	150	-67	5	38
87	150	-63	5	39
136	134	2	6	39
332	134	198	7	39
134	134	0	7	39
154	134	20	8	39
104	134	-30	8	40
130	134	-4	8	41
23	134	-111	8	42

87	110	-23	369	589
130	92	38	370	589
100	92	8	371	589
110	92	18	372	589
83	92	-9	372	590
87	92	-5	372	591
100	130	-30	372	592
110	130	-20	372	593
83	130	-47	372	594
87	130	-43	372	595
110	100	10	373	595
83	100	-17	373	596
87	100	-13	373	597
83	110	-27	373	598
87	110	-23	373	599
87	83	4	374	599

S Statistic = 374 - 599 = -225

Tied Group	Value	Members
1	134	2
2	130	3
3	48	2
4	110	5
5	87	2
6	92	2

Time Period	Observations
3/2/1995	1
5/15/1995	1
5/22/1995	1
5/31/1995	1
10/10/1995	1
6/3/1996	1
11/20/1996	1
6/3/1997	1
10/6/1997	1
6/8/1998	1
10/26/1998	1
6/28/1999	1
9/28/1999	1
6/19/2000	1
11/13/2000	1
6/18/2001	1
10/29/2001	1
6/17/2002	1
2/27/2006	1
8/23/2006	1
2/21/2007	1
8/22/2007	1
2/27/2008	1
8/20/2008	1
8/11/2009	1
3/22/2010	1
8/17/2010	1
2/22/2011	1
8/10/2011	1

2/29/2012	1
8/14/2012	1
2/19/2013	1
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1
3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 438
B = 0
C = 66
D = 0
E = 34
F = 0
a = 188100
b = 766260
c = 3960
Group Variance = 10425.7
Z-Score = -2.1938
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-2.1938 < -1.65463 indicating a downward trend

Mann-Kendall Trend Analysis

Parameter: Dissolved Solids

Location: MW-1

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
84	61	23	1	0
78	61	17	2	0
122	61	61	3	0
52	61	-9	3	1
364	61	303	4	1
70	61	9	5	1
492	61	431	6	1
58	61	-3	6	2
68	61	7	7	2
47	61	-14	7	3
65	61	4	8	3
44	61	-17	8	4
76	61	15	9	4
39	61	-22	9	5
54	61	-7	9	6
19	61	-42	9	7
24	61	-37	9	8
117	61	56	10	8
40	61	-21	10	9
47	61	-14	10	10
51	61	-10	10	11
57	61	-4	10	12
51	61	-10	10	13
73	61	12	11	13
73	61	12	12	13
81	61	20	13	13
81	61	20	14	13
64	61	3	15	13
60	61	-1	15	14
100	61	39	16	14
110	61	49	17	14
60	61	-1	17	15
67	61	6	18	15
91	61	30	19	15
64	61	3	20	15
100	61	39	21	15
90	61	29	22	15
89	61	28	23	15
68	61	7	24	15
92	61	31	25	15
73	61	12	26	15
120	61	59	27	15
110	61	49	28	15
140	61	79	29	15
110	61	49	30	15
170	61	109	31	15
130	61	69	32	15
130	61	69	33	15
78	84	-6	33	16
122	84	38	34	16
52	84	-32	34	17

140	110	30	760	390
110	110	0	760	390
170	110	60	761	390
130	110	20	762	390
130	110	20	763	390
110	140	-30	763	391
170	140	30	764	391
130	140	-10	764	392
130	140	-10	764	393
170	110	60	765	393
130	110	20	766	393
130	110	20	767	393
130	170	-40	767	394
130	170	-40	767	395
130	130	0	767	395

S Statistic = 767 - 395 = 372

Tied Group	Value	Members
1	68	2
2	47	2
3	51	2
4	73	3
5	81	2
6	64	2
7	60	2
8	100	2
9	110	3
10	130	2

Time Period	Observations
3/2/1995	1
5/15/1995	1
5/22/1995	1
5/31/1995	1
10/10/1995	1
6/3/1996	1
11/20/1996	1
6/3/1997	1
10/6/1997	1
6/8/1998	1
10/26/1998	1
6/28/1999	1
9/28/1999	1
6/19/2000	1
11/13/2000	1
6/18/2001	1
10/29/2001	1
10/7/2002	1
7/14/2003	1
2/23/2004	1
11/15/2004	1
8/10/2005	1
2/27/2006	1
8/23/2006	1
2/21/2007	1
8/22/2007	1
2/26/2008	1

8/20/2008	1
8/11/2009	1
3/22/2010	1
8/17/2010	1
2/22/2011	1
8/10/2011	1
2/29/2012	1
8/14/2012	1
2/19/2013	1
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1
3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 276
B = 0
C = 12
D = 0
E = 28
F = 0
a = 242256
b = 994896
c = 4704
Group Variance = 13443.3
Z-Score = 3.19978
Comparison Level at 95% confidence level = 1.65463 (upward trend)
3.19978 > 1.65463 indicating an upward trend

Mann-Kendall Trend Analysis

Parameter: Dissolved Solids

Location: MW-2

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
116	103	13	1	0
122	103	19	2	0
138	103	35	3	0
106	103	3	4	0
102	103	-1	4	1
72	103	-31	4	2
62	103	-41	4	3
74	103	-29	4	4
142	103	39	5	4
492	103	389	6	4
46	103	-57	6	5
50	103	-53	6	6
54	103	-49	6	7
42	103	-61	6	8
56	103	-47	6	9
80	103	-23	6	10
99	103	-4	6	11
78	103	-25	6	12
118	103	15	7	12
104	103	1	8	12
100	103	-3	8	13
99	103	-4	8	14
102	103	-1	8	15
119	103	16	9	15
108	103	5	10	15
116	103	13	11	15
90	103	-13	11	16
117	103	14	12	16
120	103	17	13	16
60	103	-43	13	17
120	103	17	14	17
94	103	-9	14	18
80	103	-23	14	19
74	103	-29	14	20
73	103	-30	14	21
58	103	-45	14	22
87	103	-16	14	23
59	103	-44	14	24
74	103	-29	14	25
35	103	-68	14	26
67	103	-36	14	27
41	103	-62	14	28
67	103	-36	14	29
63	103	-40	14	30
80	103	-23	14	31
98	103	-5	14	32
70	103	-33	14	33
77	103	-26	14	34
110	103	7	15	34
122	116	6	16	34
138	116	22	17	34

77	70	7	491	721
110	70	40	492	721
110	77	33	493	721

S Statistic = 493 - 721 = -228

Tied Group	Value	Members
1	116	2
2	102	2
3	74	3
4	80	3
5	99	2
6	120	2
7	67	2

Time Period	Observations
3/2/1995	1
5/15/1995	1
5/22/1995	1
5/31/1995	1
10/10/1995	1
6/3/1996	1
11/20/1996	1
6/3/1997	1
10/6/1997	1
6/8/1998	1
10/26/1998	1
6/28/1999	1
9/28/1999	1
6/19/2000	1
11/13/2000	1
6/18/2001	1
10/29/2001	1
6/17/2002	1
10/7/2002	1
7/14/2003	1
2/23/2004	1
11/15/2004	1
8/10/2005	1
2/27/2006	1
8/23/2006	1
2/21/2007	1
8/22/2007	1
2/27/2008	1
8/20/2008	1
8/11/2009	1
3/22/2010	1
8/17/2010	1
2/22/2011	1
8/10/2011	1
2/29/2012	1
8/14/2012	1
2/19/2013	1
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1

3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 222
B = 0
C = 12
D = 0
E = 22
F = 0
a = 257250
b = 1.0584e+006
c = 4900
Group Variance = 14279.3
Z-Score = -1.89964
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-1.89964 < -1.65463 indicating a downward trend

Mann-Kendall Trend Analysis

Parameter: Dissolved Solids

Location: MW-4

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
104	85	19	1	0
106	85	21	2	0
108	85	23	3	0
98	85	13	4	0
78	85	-7	4	1
114	85	29	5	1
144	85	59	6	1
128	85	43	7	1
156	85	71	8	1
166	85	81	9	1
304	85	219	10	1
205	85	120	11	1
205	85	120	12	1
166	85	81	13	1
297	85	212	14	1
86	85	1	15	1
112	85	27	16	1
254	85	169	17	1
268	85	183	18	1
255	85	170	19	1
217	85	132	20	1
136	85	51	21	1
215	85	130	22	1
266	85	181	23	1
190	85	105	24	1
272	85	187	25	1
200	85	115	26	1
81	85	-4	26	2
230	85	145	27	2
120	85	35	28	2
160	85	75	29	2
150	85	65	30	2
170	85	85	31	2
110	85	25	32	2
160	85	75	33	2
96	85	11	34	2
140	85	55	35	2
96	85	11	36	2
130	85	45	37	2
79	85	-6	37	3
110	85	25	38	3
92	85	7	39	3
110	85	25	40	3
94	85	9	41	3
110	85	25	42	3
99	85	14	43	3
82	85	-3	43	4
106	104	2	44	4
108	104	4	45	4
98	104	-6	45	5
78	104	-26	45	6

110	79	31	474	620
92	79	13	475	620
110	79	31	476	620
94	79	15	477	620
110	79	31	478	620
99	79	20	479	620
82	79	3	480	620
92	110	-18	480	621
110	110	0	480	621
94	110	-16	480	622
110	110	0	480	622
99	110	-11	480	623
82	110	-28	480	624
110	92	18	481	624
94	92	2	482	624
110	92	18	483	624
99	92	7	484	624
82	92	-10	484	625
94	110	-16	484	626
110	110	0	484	626
99	110	-11	484	627
82	110	-28	484	628
110	94	16	485	628
99	94	5	486	628
82	94	-12	486	629
99	110	-11	486	630
82	110	-28	486	631
82	99	-17	486	632

S Statistic = 486 - 632 = -146

Tied Group	Value	Members
1	166	2
2	205	2
3	160	2
4	110	4
5	96	2

Time Period	Observations
3/2/1995	1
5/15/1995	1
5/22/1995	1
5/31/1995	1
10/10/1995	1
6/3/1996	1
11/20/1996	1
6/3/1997	1
10/6/1997	1
10/26/1998	1
6/28/1999	1
9/28/1999	1
6/19/2000	1
11/13/2000	1
6/18/2001	1
6/17/2002	1
10/7/2002	1

7/14/2003	1
2/23/2004	1
11/15/2004	1
8/10/2005	1
2/27/2006	1
8/23/2006	1
2/21/2007	1
8/22/2007	1
2/27/2008	1
8/20/2008	1
8/11/2009	1
3/22/2010	1
8/17/2010	1
2/22/2011	1
8/10/2011	1
2/29/2012	1
8/14/2012	1
2/19/2013	1
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1
3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 228
B = 0
C = 24
D = 0
E = 20
F = 0
a = 227856
b = 933984
c = 4512
Group Variance = 12646
Z-Score = -1.28941
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-1.28941| <= 1.97737 indicating no evidence of a trend

Mann-Kendall Trend Analysis

Parameter: Dissolved Solids

Location: MW-5

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
360	426	-66	0	1
324	426	-102	0	2
356	426	-70	0	3
280	426	-146	0	4
892	426	466	1	4
162	426	-264	1	5
136	426	-290	1	6
628	426	202	2	6
448	426	22	3	6
474	426	48	4	6
142	426	-284	4	7
308	426	-118	4	8
236	426	-190	4	9
346	426	-80	4	10
162	426	-264	4	11
258	426	-168	4	12
218	426	-208	4	13
112	426	-314	4	14
112	426	-314	4	15
112	426	-314	4	16
101	426	-325	4	17
91	426	-335	4	18
106	426	-320	4	19
91	426	-335	4	20
83	426	-343	4	21
86	426	-340	4	22
87	426	-339	4	23
75	426	-351	4	24
94	426	-332	4	25
93	426	-333	4	26
76	426	-350	4	27
53	426	-373	4	28
90	426	-336	4	29
19	426	-407	4	30
ND<10	426	-416	4	31
62	426	-364	4	32
39	426	-387	4	33
43	426	-383	4	34
30	426	-396	4	35
29	426	-397	4	36
ND<10	426	-416	4	37
52	426	-374	4	38
48	426	-378	4	39
79	426	-347	4	40
41	426	-385	4	41
69	426	-357	4	42
46	426	-380	4	43
54	426	-372	4	44
324	360	-36	4	45
356	360	-4	4	46
280	360	-80	4	47

79	48	31	149	1007
41	48	-7	149	1008
69	48	21	150	1008
46	48	-2	150	1009
54	48	6	151	1009
41	79	-38	151	1010
69	79	-10	151	1011
46	79	-33	151	1012
54	79	-25	151	1013
69	41	28	152	1013
46	41	5	153	1013
54	41	13	154	1013
46	69	-23	154	1014
54	69	-15	154	1015
54	46	8	155	1015

S Statistic = 155 - 1015 = -860

Tied Group	Value	Members
1	162	2
2	112	3
3	91	2
4	10	2

Time Period	Observations
3/2/1995	1
5/15/1995	1
5/22/1995	1
5/31/1995	1
10/10/1995	1
6/4/1996	1
11/20/1996	1
6/3/1997	1
10/6/1997	1
6/8/1998	1
10/26/1998	1
6/28/1999	1
9/28/1999	1
6/19/2000	1
11/13/2000	1
6/18/2001	1
10/29/2001	1
6/17/2002	1
7/14/2003	1
2/23/2004	1
11/15/2004	1
8/10/2005	1
2/27/2006	1
8/23/2006	1
2/21/2007	1
8/22/2007	1
2/26/2008	1
8/20/2008	1
8/11/2009	1
3/22/2010	1
8/17/2010	1
2/22/2011	1
8/10/2011	1

2/29/2012	1
8/14/2012	1
2/19/2013	1
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1
3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 120
B = 0
C = 6
D = 0
E = 12
F = 0
a = 242256
b = 994896
c = 4704
Group Variance = 13452
Z-Score = -7.40627
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-7.40627 < -1.65463 indicating a downward trend

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Dissolved Solids

Location: MW-1

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0
Non detect rank is 1.5

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-3	3/2/1995	150	86
	5/15/1995	134	82
	5/22/1995	136	84
	5/31/1995	332	92
	10/10/1995	134	83
	6/3/1996	154	87
	11/20/1996	104	62
	6/3/1997	130	76
	10/6/1997	23	3
	6/8/1998	131	81
	10/26/1998	48	12
	6/28/1999	98	58
	9/28/1999	48	13
	6/19/2000	60	21
	11/13/2000	42	8
	6/18/2001	64	26
	10/29/2001	260	91
	6/17/2002	223	90
	2/27/2006	115	72
	8/23/2006	78	39
	2/21/2007	114	71
	8/22/2007	91	53
	2/27/2008	110	63
	8/20/2008	88	48
	8/11/2009	110	64
	3/22/2010	130	77
	8/17/2010	89	49
	2/22/2011	87	46
	8/10/2011	110	65
	2/29/2012	92	55
	8/14/2012	59	20
	2/19/2013	90	51
	8/15/2013	80	41
	2/25/2014	170	88
	8/26/2014	71	34
	2/23/2015	10	1
	8/19/2015	61	24
	2/22/2016	40	6
	9/6/2016	110	66
	3/6/2017	92	56
	8/8/2017	130	78
	2/26/2018	100	59
	8/29/2018	110	67
	2/25/2019	83	44
	8/26/2019	87	47
MW-1	3/2/1995	61	25
	5/15/1995	84	45
	5/22/1995	78	40
	5/31/1995	122	75

10/10/1995	52	16
6/3/1996	364	93
11/20/1996	70	33
6/3/1997	492	94
10/6/1997	58	19
6/8/1998	68	31
10/26/1998	47	10
6/28/1999	65	29
9/28/1999	44	9
6/19/2000	76	38
11/13/2000	39	5
6/18/2001	54	17
10/29/2001	19	2
10/7/2002	24	4
7/14/2003	117	73
2/23/2004	40	7
11/15/2004	47	11
8/10/2005	51	14
2/27/2006	57	18
8/23/2006	51	15
2/21/2007	73	35
8/22/2007	73	36
2/26/2008	81	42
8/20/2008	81	43
8/11/2009	64	27
3/22/2010	60	22
8/17/2010	100	60
2/22/2011	110	68
8/10/2011	60	23
2/29/2012	67	30
8/14/2012	91	54
2/19/2013	64	28
8/15/2013	100	61
2/25/2014	90	52
8/26/2014	89	50
2/23/2015	68	32
8/19/2015	92	57
2/22/2016	73	37
9/6/2016	120	74
3/6/2017	110	69
8/8/2017	140	85
2/26/2018	110	70
8/29/2018	170	89
2/25/2019	130	79
8/26/2019	130	80

The Wilcoxon Statistic is 801
The Expected value is is 1102.5
The Standard Deviation is 132.122
The Z Score is -2.28576
The Standard Deviation adjusted for ties is 132.122
The Z Score adjusted for ties is -2.28576
-2.28576 < 2.326 indicating no statistical significance at 1% level
-2.28576 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Dissolved Solids

Location: MW-2

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0
Non detect rank is 1.5

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-3	3/2/1995	150	89
	5/15/1995	134	84
	5/22/1995	136	86
	5/31/1995	332	94
	10/10/1995	134	85
	6/3/1996	154	90
	11/20/1996	104	60
	6/3/1997	130	80
	10/6/1997	23	2
	6/8/1998	131	83
	10/26/1998	48	9
	6/28/1999	98	51
	9/28/1999	48	10
	6/19/2000	60	17
	11/13/2000	42	6
	6/18/2001	64	22
	10/29/2001	260	93
	6/17/2002	223	92
	2/27/2006	115	71
	8/23/2006	78	33
	2/21/2007	114	70
	8/22/2007	91	47
	2/27/2008	110	64
	8/20/2008	88	43
	8/11/2009	110	65
	3/22/2010	130	81
	8/17/2010	89	44
	2/22/2011	87	40
	8/10/2011	110	66
	2/29/2012	92	48
	8/14/2012	59	15
	2/19/2013	90	45
	8/15/2013	80	35
	2/25/2014	170	91
	8/26/2014	71	26
	2/23/2015	10	1
	8/19/2015	61	19
	2/22/2016	40	4
	9/6/2016	110	67
	3/6/2017	92	49
	8/8/2017	130	82
	2/26/2018	100	55
	8/29/2018	110	68
	2/25/2019	83	39
	8/26/2019	87	41
MW-2	3/2/1995	103	59
	5/15/1995	116	72
	5/22/1995	122	79
	5/31/1995	138	87

10/10/1995	106	62
6/3/1996	102	57
11/20/1996	72	27
6/3/1997	62	20
10/6/1997	74	29
6/8/1998	142	88
10/26/1998	492	95
6/28/1999	46	8
9/28/1999	50	11
6/19/2000	54	12
11/13/2000	42	7
6/18/2001	56	13
10/29/2001	80	36
6/17/2002	99	53
10/7/2002	78	34
7/14/2003	118	75
2/23/2004	104	61
11/15/2004	100	56
8/10/2005	99	54
2/27/2006	102	58
8/23/2006	119	76
2/21/2007	108	63
8/22/2007	116	73
2/27/2008	90	46
8/20/2008	117	74
8/11/2009	120	77
3/22/2010	60	18
8/17/2010	120	78
2/22/2011	94	50
8/10/2011	80	37
2/29/2012	74	30
8/14/2012	73	28
2/19/2013	58	14
8/15/2013	87	42
2/25/2014	59	16
8/26/2014	74	31
2/23/2015	35	3
8/19/2015	67	23
2/22/2016	41	5
9/6/2016	67	24
3/6/2017	63	21
8/8/2017	80	38
2/26/2018	98	52
8/29/2018	70	25
2/25/2019	77	32
8/26/2019	110	69

The Wilcoxon Statistic is 923
The Expected value is is 1125
The Standard Deviation is 134.164
The Z Score is -1.50935
The Standard Deviation adjusted for ties is 134.164
The Z Score adjusted for ties is -1.50935
-1.50935 < 2.326 indicating no statistical significance at 1% level
-1.50935 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Dissolved Solids

Location: MW-4

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0
Non detect rank is 1.5

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-3	3/2/1995	150	67
	5/15/1995	134	61
	5/22/1995	136	63
	5/31/1995	332	93
	10/10/1995	134	62
	6/3/1996	154	69
	11/20/1996	104	37
	6/3/1997	130	56
	10/6/1997	23	2
	6/8/1998	131	60
	10/26/1998	48	5
	6/28/1999	98	33
	9/28/1999	48	6
	6/19/2000	60	8
	11/13/2000	42	4
	6/18/2001	64	10
	10/29/2001	260	87
	6/17/2002	223	83
	2/27/2006	115	53
	8/23/2006	78	12
	2/21/2007	114	51
	8/22/2007	91	26
	2/27/2008	110	41
	8/20/2008	88	23
	8/11/2009	110	42
	3/22/2010	130	57
	8/17/2010	89	24
	2/22/2011	87	21
	8/10/2011	110	43
	2/29/2012	92	27
	8/14/2012	59	7
	2/19/2013	90	25
	8/15/2013	80	15
	2/25/2014	170	75
	8/26/2014	71	11
	2/23/2015	10	1
	8/19/2015	61	9
	2/22/2016	40	3
	9/6/2016	110	44
	3/6/2017	92	28
	8/8/2017	130	58
	2/26/2018	100	36
	8/29/2018	110	45
	2/25/2019	83	18
	8/26/2019	87	22
MW-4	3/2/1995	85	19
	5/15/1995	104	38
	5/22/1995	106	39
	5/31/1995	108	40

10/10/1995	98	34
6/3/1996	78	13
11/20/1996	114	52
6/3/1997	144	66
10/6/1997	128	55
10/26/1998	156	70
6/28/1999	166	73
9/28/1999	304	92
6/19/2000	205	79
11/13/2000	205	80
6/18/2001	166	74
6/17/2002	297	91
10/7/2002	86	20
7/14/2003	112	50
2/23/2004	254	85
11/15/2004	268	89
8/10/2005	255	86
2/27/2006	217	82
8/23/2006	136	64
2/21/2007	215	81
8/22/2007	266	88
2/27/2008	190	77
8/20/2008	272	90
8/11/2009	200	78
3/22/2010	81	16
8/17/2010	230	84
2/22/2011	120	54
8/10/2011	160	71
2/29/2012	150	68
8/14/2012	170	76
2/19/2013	110	46
8/15/2013	160	72
2/25/2014	96	31
8/26/2014	140	65
2/23/2015	96	32
8/19/2015	130	59
2/22/2016	79	14
9/6/2016	110	47
3/6/2017	92	29
8/8/2017	110	48
2/26/2018	94	30
8/29/2018	110	49
2/25/2019	99	35
8/26/2019	82	17

The Wilcoxon Statistic is 1572
The Expected value is is 1080
The Standard Deviation is 130.077
The Z Score is 3.77853
The Standard Deviation adjusted for ties is 130.077
The Z Score adjusted for ties is 3.77853
3.77853 > 2.326 indicating statistical significance at 1% level
3.77853 > 2.326 indicating statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Dissolved Solids

Location: MW-5

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 2
Non detect rank is 1.5

Wilcoxon Ranks

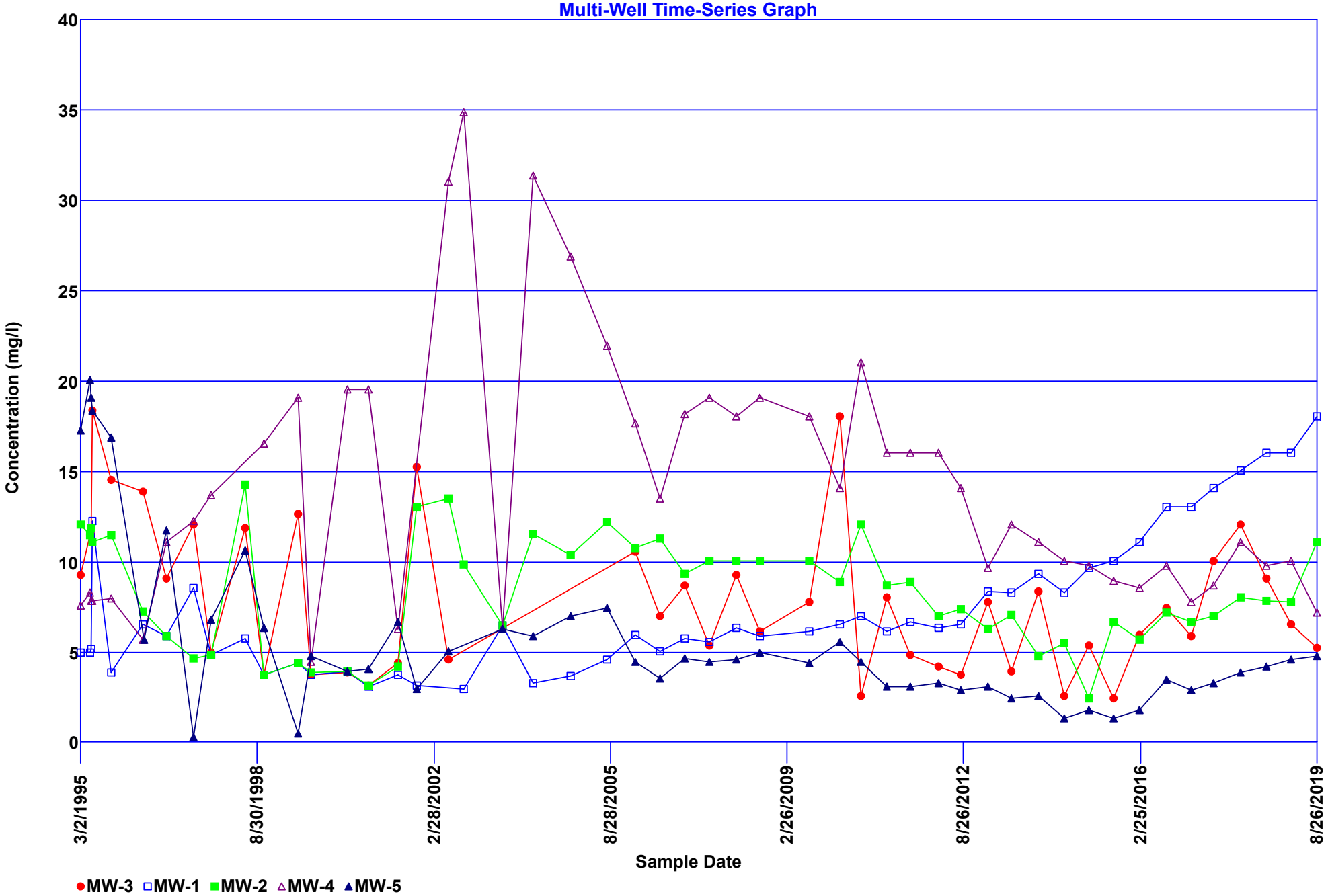
Location	Date	Conc.	Rank
MW-3	3/2/1995	150	73
	5/15/1995	134	68
	5/22/1995	136	70
	5/31/1995	332	86
	10/10/1995	134	69
	6/3/1996	154	74
	11/20/1996	104	52
	6/3/1997	130	64
	10/6/1997	23	5
	6/8/1998	131	67
	10/26/1998	48	14
	6/28/1999	98	49
	9/28/1999	48	15
	6/19/2000	60	21
	11/13/2000	42	11
	6/18/2001	64	24
	10/29/2001	260	82
	6/17/2002	223	79
	2/27/2006	115	63
	8/23/2006	78	29
	2/21/2007	114	62
	8/22/2007	91	42
	2/27/2008	110	54
	8/20/2008	88	38
	8/11/2009	110	55
	3/22/2010	130	65
	8/17/2010	89	39
	2/22/2011	87	35
	8/10/2011	110	56
	2/29/2012	92	45
	8/14/2012	59	20
	2/19/2013	90	40
	8/15/2013	80	31
	2/25/2014	170	77
	8/26/2014	71	26
	2/23/2015	10	3
	8/19/2015	61	22
	2/22/2016	40	9
	9/6/2016	110	57
	3/6/2017	92	46
	8/8/2017	130	66
	2/26/2018	100	50
	8/29/2018	110	58
	2/25/2019	83	32
	8/26/2019	87	36
MW-5	3/2/1995	426	90
	5/15/1995	360	89
	5/22/1995	324	85
	5/31/1995	356	88

10/10/1995	280	83
6/4/1996	892	94
11/20/1996	162	75
6/3/1997	136	71
10/6/1997	628	93
6/8/1998	448	91
10/26/1998	474	92
6/28/1999	142	72
9/28/1999	308	84
6/19/2000	236	80
11/13/2000	346	87
6/18/2001	162	76
10/29/2001	258	81
6/17/2002	218	78
7/14/2003	112	59
2/23/2004	112	60
11/15/2004	112	61
8/10/2005	101	51
2/27/2006	91	43
8/23/2006	106	53
2/21/2007	91	44
8/22/2007	83	33
2/26/2008	86	34
8/20/2008	87	37
8/11/2009	75	27
3/22/2010	94	48
8/17/2010	93	47
2/22/2011	76	28
8/10/2011	53	18
2/29/2012	90	41
8/14/2012	19	4
2/19/2013	ND<10	1.5
8/15/2013	62	23
2/25/2014	39	8
8/26/2014	43	12
2/23/2015	30	7
8/19/2015	29	6
2/22/2016	ND<10	1.5
9/6/2016	52	17
3/6/2017	48	16
8/8/2017	79	30
2/26/2018	41	10
8/29/2018	69	25
2/25/2019	46	13
8/26/2019	54	19

The Wilcoxon Statistic is 1161
The Expected value is is 1102.5
The Standard Deviation is 132.122
The Z Score is 0.438988
The Standard Deviation adjusted for ties is 132.122
The Z Score adjusted for ties is 0.438989
0.438988 < 2.326 indicating no statistical significance at 1% level
0.438989 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

Nitrate

Multi-Well Time-Series Graph



Mann-Kendall Trend Analysis

Parameter: Nitrate

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
11.4	9.2	2.2	1	0
11.4	9.2	2.2	2	0
18.3	9.2	9.1	3	0
14.5	9.2	5.3	4	0
13.8	9.2	4.6	5	0
9	9.2	-0.2	5	1
12	9.2	2.8	6	1
4.9	9.2	-4.3	6	2
11.8	9.2	2.6	7	2
3.7	9.2	-5.5	7	3
12.6	9.2	3.4	8	3
3.7	9.2	-5.5	8	4
3.8	9.2	-5.4	8	5
3.1	9.2	-6.1	8	6
4.3	9.2	-4.9	8	7
15.2	9.2	6	9	7
4.5	9.2	-4.7	9	8
10.5	9.2	1.3	10	8
6.9	9.2	-2.3	10	9
8.6	9.2	-0.6	10	10
5.3	9.2	-3.9	10	11
9.2	9.2	0	10	11
6.1	9.2	-3.1	10	12
7.7	9.2	-1.5	10	13
18	9.2	8.8	11	13
2.5	9.2	-6.7	11	14
8	9.2	-1.2	11	15
4.8	9.2	-4.4	11	16
4.1	9.2	-5.1	11	17
3.7	9.2	-5.5	11	18
7.7	9.2	-1.5	11	19
3.9	9.2	-5.3	11	20
8.3	9.2	-0.9	11	21
2.5	9.2	-6.7	11	22
5.3	9.2	-3.9	11	23
2.4	9.2	-6.8	11	24
5.9	9.2	-3.3	11	25
7.4	9.2	-1.8	11	26
5.8	9.2	-3.4	11	27
10	9.2	0.8	12	27
12	9.2	2.8	13	27
9	9.2	-0.2	13	28
6.5	9.2	-2.7	13	29
5.2	9.2	-4	13	30
11.4	11.4	0	13	30
18.3	11.4	6.9	14	30
14.5	11.4	3.1	15	30
13.8	11.4	2.4	16	30
9	11.4	-2.4	16	31
12	11.4	0.6	17	31
4.9	11.4	-6.5	17	32

5.2	7.4	-2.2	383	582
10	5.8	4.2	384	582
12	5.8	6.2	385	582
9	5.8	3.2	386	582
6.5	5.8	0.7	387	582
5.2	5.8	-0.6	387	583
12	10	2	388	583
9	10	-1	388	584
6.5	10	-3.5	388	585
5.2	10	-4.8	388	586
9	12	-3	388	587
6.5	12	-5.5	388	588
5.2	12	-6.8	388	589
6.5	9	-2.5	388	590
5.2	9	-3.8	388	591
5.2	6.5	-1.3	388	592

S Statistic = 388 - 592 = -204

Tied Group	Value	Members
1	9.2	2
2	11.4	2
3	9	2
4	12	2
5	3.7	3
6	5.3	2
7	7.7	2
8	2.5	2

Time Period	Observations
3/2/1995	1
5/15/1995	1
5/22/1995	1
5/31/1995	1
10/10/1995	1
6/3/1996	1
11/20/1996	1
6/3/1997	1
10/6/1997	1
6/8/1998	1
10/26/1998	1
6/28/1999	1
9/28/1999	1
6/19/2000	1
11/13/2000	1
6/18/2001	1
10/29/2001	1
6/17/2002	1
2/27/2006	1
8/23/2006	1
2/21/2007	1
8/22/2007	1
2/27/2008	1
8/20/2008	1
8/11/2009	1
3/22/2010	1
8/17/2010	1

2/22/2011	1
8/10/2011	1
2/29/2012	1
8/14/2012	1
2/19/2013	1
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1
3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 192
B = 0
C = 6
D = 0
E = 20
F = 0
a = 188100
b = 766260
c = 3960
Group Variance = 10439.3
Z-Score = -1.98683
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-1.98683 < -1.65463 indicating a downward trend

Mann-Kendall Trend Analysis

Parameter: Nitrate

Location: MW-1

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
4.9	4.9	0	0	0
5.1	4.9	0.2	1	0
12.2	4.9	7.3	2	0
3.8	4.9	-1.1	2	1
6.5	4.9	1.6	3	1
5.8	4.9	0.9	4	1
8.5	4.9	3.6	5	1
4.8	4.9	-0.1	5	2
5.7	4.9	0.8	6	2
3.7	4.9	-1.2	6	3
4.3	4.9	-0.6	6	4
3.7	4.9	-1.2	6	5
3.9	4.9	-1	6	6
3	4.9	-1.9	6	7
3.7	4.9	-1.2	6	8
3.1	4.9	-1.8	6	9
2.9	4.9	-2	6	10
6.4	4.9	1.5	7	10
3.2	4.9	-1.7	7	11
3.6	4.9	-1.3	7	12
4.5	4.9	-0.4	7	13
5.9	4.9	1	8	13
5	4.9	0.1	9	13
5.7	4.9	0.8	10	13
5.5	4.9	0.6	11	13
6.3	4.9	1.4	12	13
5.8	4.9	0.9	13	13
6.1	4.9	1.2	14	13
6.5	4.9	1.6	15	13
6.9	4.9	2	16	13
6.1	4.9	1.2	17	13
6.6	4.9	1.7	18	13
6.3	4.9	1.4	19	13
6.5	4.9	1.6	20	13
8.3	4.9	3.4	21	13
8.2	4.9	3.3	22	13
9.3	4.9	4.4	23	13
8.2	4.9	3.3	24	13
9.6	4.9	4.7	25	13
10	4.9	5.1	26	13
11	4.9	6.1	27	13
13	4.9	8.1	28	13
13	4.9	8.1	29	13
14	4.9	9.1	30	13
15	4.9	10.1	31	13
16	4.9	11.1	32	13
16	4.9	11.1	33	13
18	4.9	13.1	34	13
5.1	4.9	0.2	35	13
12.2	4.9	7.3	36	13
3.8	4.9	-1.1	36	14

14	13	1	908	241
15	13	2	909	241
16	13	3	910	241
16	13	3	911	241
18	13	5	912	241
15	14	1	913	241
16	14	2	914	241
16	14	2	915	241
18	14	4	916	241
16	15	1	917	241
16	15	1	918	241
18	15	3	919	241
16	16	0	919	241
18	16	2	920	241
18	16	2	921	241

S Statistic = 921 - 241 = 680

Tied Group	Value	Members
1	4.9	2
2	6.5	3
3	5.8	2
4	5.7	2
5	3.7	3
6	6.3	2
7	6.1	2
8	8.2	2
9	13	2
10	16	2

Time Period	Observations
3/2/1995	1
5/15/1995	1
5/22/1995	1
5/31/1995	1
10/10/1995	1
6/3/1996	1
11/20/1996	1
6/3/1997	1
10/6/1997	1
6/8/1998	1
10/26/1998	1
6/28/1999	1
9/28/1999	1
6/19/2000	1
11/13/2000	1
6/18/2001	1
10/29/2001	1
10/7/2002	1
7/14/2003	1
2/23/2004	1
11/15/2004	1
8/10/2005	1
2/27/2006	1
8/23/2006	1
2/21/2007	1
8/22/2007	1
2/26/2008	1

8/20/2008	1
8/11/2009	1
3/22/2010	1
8/17/2010	1
2/22/2011	1
8/10/2011	1
2/29/2012	1
8/14/2012	1
2/19/2013	1
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1
3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 276
B = 0
C = 12
D = 0
E = 28
F = 0
a = 242256
b = 994896
c = 4704
Group Variance = 13443.3
Z-Score = 5.85621
Comparison Level at 95% confidence level = 1.65463 (upward trend)
5.85621 > 1.65463 indicating an upward trend

Mann-Kendall Trend Analysis

Parameter: Nitrate

Location: MW-2

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
11.4	12	-0.6	0	1
11.8	12	-0.2	0	2
11	12	-1	0	3
11.4	12	-0.6	0	4
7.2	12	-4.8	0	5
5.8	12	-6.2	0	6
4.6	12	-7.4	0	7
4.8	12	-7.2	0	8
14.2	12	2.2	1	8
3.7	12	-8.3	1	9
4.3	12	-7.7	1	10
3.8	12	-8.2	1	11
3.9	12	-8.1	1	12
3.1	12	-8.9	1	13
4.1	12	-7.9	1	14
13	12	1	2	14
13.4	12	1.4	3	14
9.8	12	-2.2	3	15
6.4	12	-5.6	3	16
11.5	12	-0.5	3	17
10.3	12	-1.7	3	18
12.1	12	0.1	4	18
10.7	12	-1.3	4	19
11.2	12	-0.8	4	20
9.3	12	-2.7	4	21
10	12	-2	4	22
10	12	-2	4	23
10	12	-2	4	24
10	12	-2	4	25
8.8	12	-3.2	4	26
12	12	0	4	26
8.6	12	-3.4	4	27
8.8	12	-3.2	4	28
6.9	12	-5.1	4	29
7.3	12	-4.7	4	30
6.2	12	-5.8	4	31
7	12	-5	4	32
4.7	12	-7.3	4	33
5.4	12	-6.6	4	34
2.4	12	-9.6	4	35
6.6	12	-5.4	4	36
5.6	12	-6.4	4	37
7.1	12	-4.9	4	38
6.6	12	-5.4	4	39
6.9	12	-5.1	4	40
8	12	-4	4	41
7.8	12	-4.2	4	42
7.7	12	-4.3	4	43
11	12	-1	4	44
11.8	11.4	0.4	5	44
11	11.4	-0.4	5	45

7.7	7.8	-0.1	505	706
11	7.8	3.2	506	706
11	7.7	3.3	507	706

S Statistic = 507 - 706 = -199

Tied Group	Value	Members
1	12	2
2	11.4	2
3	11	2
4	10	4
5	8.8	2
6	6.9	2
7	6.6	2

Time Period	Observations
3/2/1995	1
5/15/1995	1
5/22/1995	1
5/31/1995	1
10/10/1995	1
6/3/1996	1
11/20/1996	1
6/3/1997	1
10/6/1997	1
6/8/1998	1
10/26/1998	1
6/28/1999	1
9/28/1999	1
6/19/2000	1
11/13/2000	1
6/18/2001	1
10/29/2001	1
6/17/2002	1
10/7/2002	1
7/14/2003	1
2/23/2004	1
11/15/2004	1
8/10/2005	1
2/27/2006	1
8/23/2006	1
2/21/2007	1
8/22/2007	1
2/27/2008	1
8/20/2008	1
8/11/2009	1
3/22/2010	1
8/17/2010	1
2/22/2011	1
8/10/2011	1
2/29/2012	1
8/14/2012	1
2/19/2013	1
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1

3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 264
B = 0
C = 24
D = 0
E = 24
F = 0
a = 257250
b = 1.0584e+006
c = 4900
Group Variance = 14277
Z-Score = -1.65709
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-1.65709 < -1.65463 indicating a downward trend

Mann-Kendall Trend Analysis

Parameter: Nitrate

Location: MW-4

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
8.2	7.5	0.7	1	0
7.8	7.5	0.3	2	0
7.8	7.5	0.3	3	0
7.9	7.5	0.4	4	0
5.6	7.5	-1.9	4	1
11	7.5	3.5	5	1
12.2	7.5	4.7	6	1
13.6	7.5	6.1	7	1
16.5	7.5	9	8	1
19	7.5	11.5	9	1
4.4	7.5	-3.1	9	2
19.5	7.5	12	10	2
19.5	7.5	12	11	2
6.2	7.5	-1.3	11	3
31	7.5	23.5	12	3
34.8	7.5	27.3	13	3
6.3	7.5	-1.2	13	4
31.3	7.5	23.8	14	4
26.8	7.5	19.3	15	4
21.9	7.5	14.4	16	4
17.6	7.5	10.1	17	4
13.4	7.5	5.9	18	4
18.1	7.5	10.6	19	4
19	7.5	11.5	20	4
18	7.5	10.5	21	4
19	7.5	11.5	22	4
18	7.5	10.5	23	4
14	7.5	6.5	24	4
21	7.5	13.5	25	4
16	7.5	8.5	26	4
16	7.5	8.5	27	4
16	7.5	8.5	28	4
14	7.5	6.5	29	4
9.6	7.5	2.1	30	4
12	7.5	4.5	31	4
11	7.5	3.5	32	4
10	7.5	2.5	33	4
9.7	7.5	2.2	34	4
8.9	7.5	1.4	35	4
8.5	7.5	1	36	4
9.7	7.5	2.2	37	4
7.7	7.5	0.2	38	4
8.6	7.5	1.1	39	4
11	7.5	3.5	40	4
9.7	7.5	2.2	41	4
10	7.5	2.5	42	4
7.1	7.5	-0.4	42	5
7.8	8.2	-0.4	42	6
7.8	8.2	-0.4	42	7
7.9	8.2	-0.3	42	8
5.6	8.2	-2.6	42	9

9.7	8.5	1.2	483	602
7.7	8.5	-0.8	483	603
8.6	8.5	0.1	484	603
11	8.5	2.5	485	603
9.7	8.5	1.2	486	603
10	8.5	1.5	487	603
7.1	8.5	-1.4	487	604
7.7	9.7	-2	487	605
8.6	9.7	-1.1	487	606
11	9.7	1.3	488	606
9.7	9.7	0	488	606
10	9.7	0.3	489	606
7.1	9.7	-2.6	489	607
8.6	7.7	0.9	490	607
11	7.7	3.3	491	607
9.7	7.7	2	492	607
10	7.7	2.3	493	607
7.1	7.7	-0.6	493	608
11	8.6	2.4	494	608
9.7	8.6	1.1	495	608
10	8.6	1.4	496	608
7.1	8.6	-1.5	496	609
9.7	11	-1.3	496	610
10	11	-1	496	611
7.1	11	-3.9	496	612
10	9.7	0.3	497	612
7.1	9.7	-2.6	497	613
7.1	10	-2.9	497	614

S Statistic = 497 - 614 = -117

Tied Group	Value	Members
1	7.8	2
2	11	3
3	19	3
4	19.5	2
5	18	2
6	14	2
7	16	3
8	10	2
9	9.7	3

Time Period	Observations
3/2/1995	1
5/15/1995	1
5/22/1995	1
5/31/1995	1
10/10/1995	1
6/3/1996	1
11/20/1996	1
6/3/1997	1
10/6/1997	1
10/26/1998	1
6/28/1999	1
9/28/1999	1
6/19/2000	1

11/13/2000	1
6/18/2001	1
6/17/2002	1
10/7/2002	1
7/14/2003	1
2/23/2004	1
11/15/2004	1
8/10/2005	1
2/27/2006	1
8/23/2006	1
2/21/2007	1
8/22/2007	1
2/27/2008	1
8/20/2008	1
8/11/2009	1
3/22/2010	1
8/17/2010	1
2/22/2011	1
8/10/2011	1
2/29/2012	1
8/14/2012	1
2/19/2013	1
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1
3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 354
B = 0
C = 24
D = 0
E = 34
F = 0
a = 227856
b = 933984
c = 4512
Group Variance = 12639
Z-Score = -1.03181
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-1.03181| <= 1.97737 indicating no evidence of a trend

Mann-Kendall Trend Analysis

Parameter: Nitrate

Location: MW-5

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
20	17.2	2.8	1	0
19	17.2	1.8	2	0
18.3	17.2	1.1	3	0
16.8	17.2	-0.4	3	1
5.6	17.2	-11.6	3	2
11.7	17.2	-5.5	3	3
ND<0.2	17.2	-17	3	4
6.7	17.2	-10.5	3	5
10.6	17.2	-6.6	3	6
6.3	17.2	-10.9	3	7
0.4	17.2	-16.8	3	8
4.7	17.2	-12.5	3	9
3.9	17.2	-13.3	3	10
4	17.2	-13.2	3	11
6.6	17.2	-10.6	3	12
2.9	17.2	-14.3	3	13
5	17.2	-12.2	3	14
6.2	17.2	-11	3	15
5.8	17.2	-11.4	3	16
6.9	17.2	-10.3	3	17
7.4	17.2	-9.8	3	18
4.4	17.2	-12.8	3	19
3.5	17.2	-13.7	3	20
4.6	17.2	-12.6	3	21
4.4	17.2	-12.8	3	22
4.5	17.2	-12.7	3	23
4.9	17.2	-12.3	3	24
4.3	17.2	-12.9	3	25
5.5	17.2	-11.7	3	26
4.4	17.2	-12.8	3	27
3	17.2	-14.2	3	28
3	17.2	-14.2	3	29
3.2	17.2	-14	3	30
2.8	17.2	-14.4	3	31
3	17.2	-14.2	3	32
2.4	17.2	-14.8	3	33
2.5	17.2	-14.7	3	34
1.3	17.2	-15.9	3	35
1.7	17.2	-15.5	3	36
1.3	17.2	-15.9	3	37
1.7	17.2	-15.5	3	38
3.4	17.2	-13.8	3	39
2.8	17.2	-14.4	3	40
3.2	17.2	-14	3	41
3.8	17.2	-13.4	3	42
4.1	17.2	-13.1	3	43
4.5	17.2	-12.7	3	44
4.7	17.2	-12.5	3	45
19	20	-1	3	46
18.3	20	-1.7	3	47
16.8	20	-3.2	3	48

3.2	2.8	0.4	293	857
3.8	2.8	1	294	857
4.1	2.8	1.3	295	857
4.5	2.8	1.7	296	857
4.7	2.8	1.9	297	857
3.8	3.2	0.6	298	857
4.1	3.2	0.9	299	857
4.5	3.2	1.3	300	857
4.7	3.2	1.5	301	857
4.1	3.8	0.3	302	857
4.5	3.8	0.7	303	857
4.7	3.8	0.9	304	857
4.5	4.1	0.4	305	857
4.7	4.1	0.6	306	857
4.7	4.5	0.2	307	857

S Statistic = 307 - 857 = -550

Tied Group	Value	Members
1	4.7	2
2	4.4	3
3	4.5	2
4	3	3
5	3.2	2
6	2.8	2
7	1.3	2
8	1.7	2

Time Period	Observations
3/2/1995	1
5/15/1995	1
5/22/1995	1
5/31/1995	1
10/10/1995	1
6/4/1996	1
11/20/1996	1
6/3/1997	1
10/6/1997	1
6/8/1998	1
10/26/1998	1
6/28/1999	1
9/28/1999	1
6/19/2000	1
11/13/2000	1
6/18/2001	1
10/29/2001	1
6/17/2002	1
7/14/2003	1
2/23/2004	1
11/15/2004	1
8/10/2005	1
2/27/2006	1
8/23/2006	1
2/21/2007	1
8/22/2007	1
2/26/2008	1
8/20/2008	1
8/11/2009	1

3/22/2010	1
8/17/2010	1
2/22/2011	1
8/10/2011	1
2/29/2012	1
8/14/2012	1
2/19/2013	1
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1
3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 240
B = 0
C = 12
D = 0
E = 24
F = 0
a = 242256
b = 994896
c = 4704
Group Variance = 13445.3
Z-Score = -4.73464
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-4.73464 < -1.65463 indicating a downward trend

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Nitrate

Location: MW-1

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0
Non detect rank is 1

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-3	3/2/1995	9.2	68
	5/15/1995	11.4	76
	5/22/1995	11.4	77
	5/31/1995	18.3	94
	10/10/1995	14.5	87
	6/3/1996	13.8	85
	11/20/1996	9	66
	6/3/1997	12	79
	10/6/1997	4.9	27
	6/8/1998	11.8	78
	10/26/1998	3.7	10
	6/28/1999	12.6	82
	9/28/1999	3.7	11
	6/19/2000	3.8	16
	11/13/2000	3.1	6
	6/18/2001	4.3	21
	10/29/2001	15.2	89
	6/17/2002	4.5	23
	2/27/2006	10.5	74
	8/23/2006	6.9	54
	2/21/2007	8.6	65
	8/22/2007	5.3	33
	2/27/2008	9.2	69
	8/20/2008	6.1	43
	8/11/2009	7.7	57
	3/22/2010	18	92
	8/17/2010	2.5	2
	2/22/2011	8	59
	8/10/2011	4.8	25
	2/29/2012	4.1	20
	8/14/2012	3.7	12
	2/19/2013	7.7	58
	8/15/2013	3.9	18
	2/25/2014	8.3	62
	8/26/2014	2.5	3
	2/23/2015	5.3	34
	8/19/2015	2.4	1
	2/22/2016	5.9	41
	9/6/2016	7.4	56
	3/6/2017	5.8	38
	8/8/2017	10	72
	2/26/2018	12	80
	8/29/2018	9	67
	2/25/2019	6.5	49
	8/26/2019	5.2	32
MW-1	3/2/1995	4.9	28
	5/15/1995	4.9	29
	5/22/1995	5.1	31
	5/31/1995	12.2	81

10/10/1995	3.8	17
6/3/1996	6.5	50
11/20/1996	5.8	39
6/3/1997	8.5	64
10/6/1997	4.8	26
6/8/1998	5.7	36
10/26/1998	3.7	13
6/28/1999	4.3	22
9/28/1999	3.7	14
6/19/2000	3.9	19
11/13/2000	3	5
6/18/2001	3.7	15
10/29/2001	3.1	7
10/7/2002	2.9	4
7/14/2003	6.4	48
2/23/2004	3.2	8
11/15/2004	3.6	9
8/10/2005	4.5	24
2/27/2006	5.9	42
8/23/2006	5	30
2/21/2007	5.7	37
8/22/2007	5.5	35
2/26/2008	6.3	46
8/20/2008	5.8	40
8/11/2009	6.1	44
3/22/2010	6.5	51
8/17/2010	6.9	55
2/22/2011	6.1	45
8/10/2011	6.6	53
2/29/2012	6.3	47
8/14/2012	6.5	52
2/19/2013	8.3	63
8/15/2013	8.2	60
2/25/2014	9.3	70
8/26/2014	8.2	61
2/23/2015	9.6	71
8/19/2015	10	73
2/22/2016	11	75
9/6/2016	13	83
3/6/2017	13	84
8/8/2017	14	86
2/26/2018	15	88
8/29/2018	16	90
2/25/2019	16	91
8/26/2019	18	93

The Wilcoxon Statistic is 1029
The Expected value is is 1102.5
The Standard Deviation is 132.122
The Z Score is -0.560088
The Standard Deviation adjusted for ties is 132.122
The Z Score adjusted for ties is -0.560088
-0.560088 < 2.326 indicating no statistical significance at 1% level
-0.560088 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Nitrate

Location: MW-2

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0
Non detect rank is 1

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-3	3/2/1995	9.2	60
	5/15/1995	11.4	75
	5/22/1995	11.4	76
	5/31/1995	18.3	95
	10/10/1995	14.5	92
	6/3/1996	13.8	90
	11/20/1996	9	58
	6/3/1997	12	82
	10/6/1997	4.9	24
	6/8/1998	11.8	80
	10/26/1998	3.7	7
	6/28/1999	12.6	87
	9/28/1999	3.7	8
	6/19/2000	3.8	11
	11/13/2000	3.1	5
	6/18/2001	4.3	17
	10/29/2001	15.2	93
	6/17/2002	4.5	19
	2/27/2006	10.5	70
	8/23/2006	6.9	39
	2/21/2007	8.6	54
	8/22/2007	5.3	26
	2/27/2008	9.2	61
	8/20/2008	6.1	33
	8/11/2009	7.7	47
	3/22/2010	18	94
	8/17/2010	2.5	3
	2/22/2011	8	51
	8/10/2011	4.8	22
	2/29/2012	4.1	15
	8/14/2012	3.7	9
	2/19/2013	7.7	48
	8/15/2013	3.9	13
	2/25/2014	8.3	53
	8/26/2014	2.5	4
	2/23/2015	5.3	27
	8/19/2015	2.4	1
	2/22/2016	5.9	32
	9/6/2016	7.4	46
	3/6/2017	5.8	30
	8/8/2017	10	64
	2/26/2018	12	83
	8/29/2018	9	59
	2/25/2019	6.5	36
	8/26/2019	5.2	25
MW-2	3/2/1995	12	84
	5/15/1995	11.4	77
	5/22/1995	11.8	81
	5/31/1995	11	72

10/10/1995	11.4	78
6/3/1996	7.2	44
11/20/1996	5.8	31
6/3/1997	4.6	20
10/6/1997	4.8	23
6/8/1998	14.2	91
10/26/1998	3.7	10
6/28/1999	4.3	18
9/28/1999	3.8	12
6/19/2000	3.9	14
11/13/2000	3.1	6
6/18/2001	4.1	16
10/29/2001	13	88
6/17/2002	13.4	89
10/7/2002	9.8	63
7/14/2003	6.4	35
2/23/2004	11.5	79
11/15/2004	10.3	69
8/10/2005	12.1	86
2/27/2006	10.7	71
8/23/2006	11.2	74
2/21/2007	9.3	62
8/22/2007	10	65
2/27/2008	10	66
8/20/2008	10	67
8/11/2009	10	68
3/22/2010	8.8	56
8/17/2010	12	85
2/22/2011	8.6	55
8/10/2011	8.8	57
2/29/2012	6.9	40
8/14/2012	7.3	45
2/19/2013	6.2	34
8/15/2013	7	42
2/25/2014	4.7	21
8/26/2014	5.4	28
2/23/2015	2.4	2
8/19/2015	6.6	37
2/22/2016	5.6	29
9/6/2016	7.1	43
3/6/2017	6.6	38
8/8/2017	6.9	41
2/26/2018	8	52
8/29/2018	7.8	50
2/25/2019	7.7	49
8/26/2019	11	73

The Wilcoxon Statistic is 1261
The Expected value is is 1125
The Standard Deviation is 134.164
The Z Score is 1.00996
The Standard Deviation adjusted for ties is 134.164
The Z Score adjusted for ties is 1.00996
1.00996 < 2.326 indicating no statistical significance at 1% level
1.00996 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Nitrate

Location: MW-4

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0
Non detect rank is 1

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-3	3/2/1995	9.2	45
	5/15/1995	11.4	58
	5/22/1995	11.4	59
	5/31/1995	18.3	82
	10/10/1995	14.5	71
	6/3/1996	13.8	68
	11/20/1996	9	43
	6/3/1997	12	61
	10/6/1997	4.9	15
	6/8/1998	11.8	60
	10/26/1998	3.7	5
	6/28/1999	12.6	65
	9/28/1999	3.7	6
	6/19/2000	3.8	8
	11/13/2000	3.1	4
	6/18/2001	4.3	11
	10/29/2001	15.2	72
	6/17/2002	4.5	13
	2/27/2006	10.5	54
	8/23/2006	6.9	26
	2/21/2007	8.6	40
	8/22/2007	5.3	17
	2/27/2008	9.2	46
	8/20/2008	6.1	22
	8/11/2009	7.7	30
	3/22/2010	18	78
	8/17/2010	2.5	2
	2/22/2011	8	36
	8/10/2011	4.8	14
	2/29/2012	4.1	10
	8/14/2012	3.7	7
	2/19/2013	7.7	31
	8/15/2013	3.9	9
	2/25/2014	8.3	38
	8/26/2014	2.5	3
	2/23/2015	5.3	18
	8/19/2015	2.4	1
	2/22/2016	5.9	21
	9/6/2016	7.4	28
	3/6/2017	5.8	20
	8/8/2017	10	51
	2/26/2018	12	62
	8/29/2018	9	44
	2/25/2019	6.5	25
	8/26/2019	5.2	16
MW-4	3/2/1995	7.5	29
	5/15/1995	8.2	37
	5/22/1995	7.8	33
	5/31/1995	7.8	34

10/10/1995	7.9	35
6/3/1996	5.6	19
11/20/1996	11	55
6/3/1997	12.2	64
10/6/1997	13.6	67
10/26/1998	16.5	76
6/28/1999	19	83
9/28/1999	4.4	12
6/19/2000	19.5	86
11/13/2000	19.5	87
6/18/2001	6.2	23
6/17/2002	31	91
10/7/2002	34.8	93
7/14/2003	6.3	24
2/23/2004	31.3	92
11/15/2004	26.8	90
8/10/2005	21.9	89
2/27/2006	17.6	77
8/23/2006	13.4	66
2/21/2007	18.1	81
8/22/2007	19	84
2/27/2008	18	79
8/20/2008	19	85
8/11/2009	18	80
3/22/2010	14	69
8/17/2010	21	88
2/22/2011	16	73
8/10/2011	16	74
2/29/2012	16	75
8/14/2012	14	70
2/19/2013	9.6	47
8/15/2013	12	63
2/25/2014	11	56
8/26/2014	10	52
2/23/2015	9.7	48
8/19/2015	8.9	42
2/22/2016	8.5	39
9/6/2016	9.7	49
3/6/2017	7.7	32
8/8/2017	8.6	41
2/26/2018	11	57
8/29/2018	9.7	50
2/25/2019	10	53
8/26/2019	7.1	27

The Wilcoxon Statistic is 1700
The Expected value is is 1080
The Standard Deviation is 130.077
The Z Score is 4.76257
The Standard Deviation adjusted for ties is 130.077
The Z Score adjusted for ties is 4.76257
4.76257 > 2.326 indicating statistical significance at 1% level
4.76257 > 2.326 indicating statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Nitrate

Location: MW-5

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 1
Non detect rank is 1

Wilcoxon Ranks

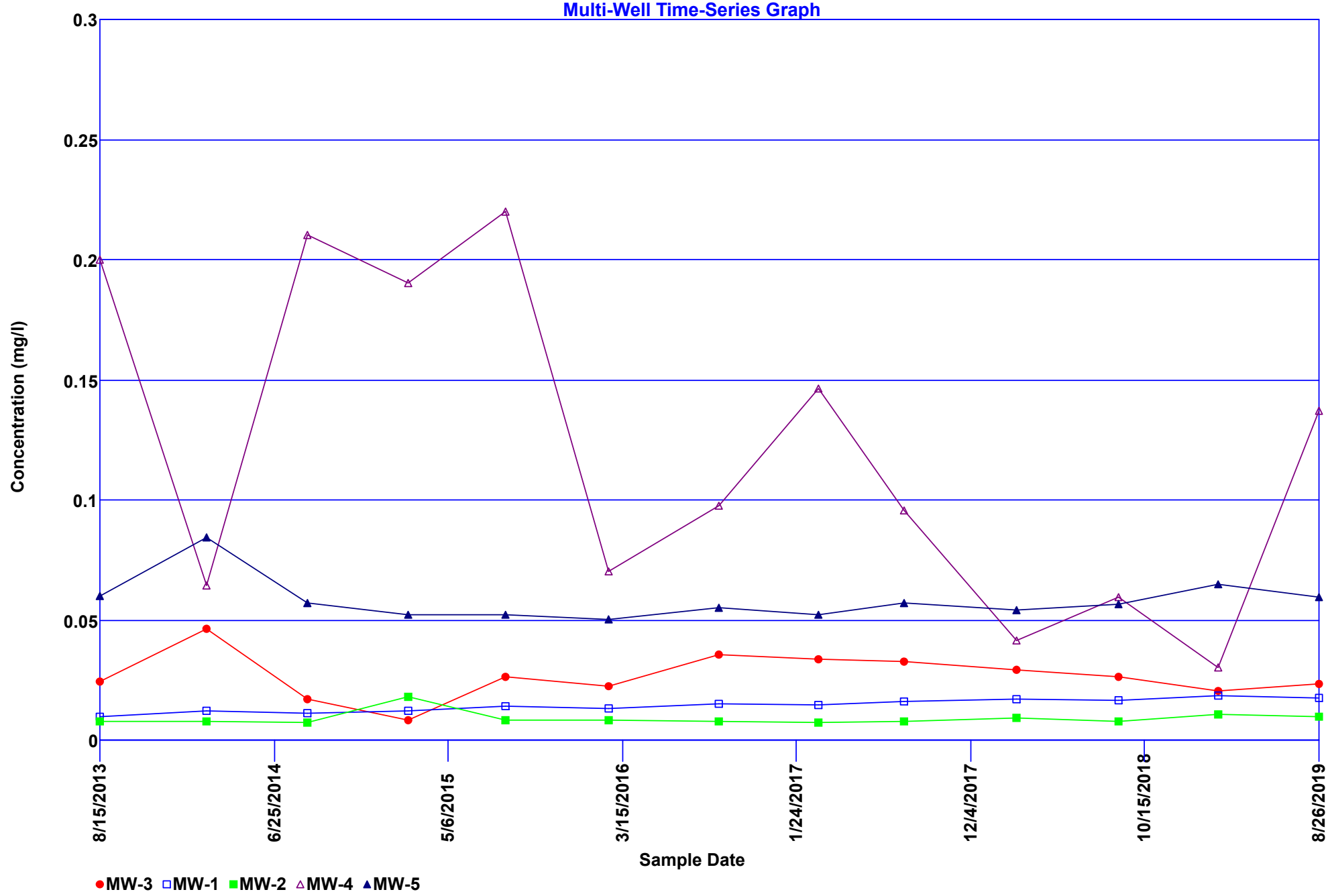
Location	Date	Conc.	Rank
MW-3	3/2/1995	9.2	73
	5/15/1995	11.4	78
	5/22/1995	11.4	79
	5/31/1995	18.3	91
	10/10/1995	14.5	86
	6/3/1996	13.8	85
	11/20/1996	9	71
	6/3/1997	12	82
	10/6/1997	4.9	45
	6/8/1998	11.8	81
	10/26/1998	3.7	23
	6/28/1999	12.6	84
	9/28/1999	3.7	24
	6/19/2000	3.8	26
	11/13/2000	3.1	18
	6/18/2001	4.3	33
	10/29/2001	15.2	87
	6/17/2002	4.5	38
	2/27/2006	10.5	76
	8/23/2006	6.9	62
	2/21/2007	8.6	70
	8/22/2007	5.3	49
	2/27/2008	9.2	74
	8/20/2008	6.1	56
	8/11/2009	7.7	66
	3/22/2010	18	90
	8/17/2010	2.5	9
	2/22/2011	8	68
	8/10/2011	4.8	44
	2/29/2012	4.1	31
	8/14/2012	3.7	25
	2/19/2013	7.7	67
	8/15/2013	3.9	28
	2/25/2014	8.3	69
	8/26/2014	2.5	10
	2/23/2015	5.3	50
	8/19/2015	2.4	7
	2/22/2016	5.9	55
	9/6/2016	7.4	64
	3/6/2017	5.8	53
	8/8/2017	10	75
	2/26/2018	12	83
	8/29/2018	9	72
	2/25/2019	6.5	59
	8/26/2019	5.2	48
MW-5	3/2/1995	17.2	89
	5/15/1995	20	94
	5/22/1995	19	93
	5/31/1995	18.3	92

10/10/1995	16.8	88
6/4/1996	5.6	52
11/20/1996	11.7	80
6/3/1997	ND<0.2	1
10/6/1997	6.7	61
6/8/1998	10.6	77
10/26/1998	6.3	58
6/28/1999	0.4	2
9/28/1999	4.7	42
6/19/2000	3.9	29
11/13/2000	4	30
6/18/2001	6.6	60
10/29/2001	2.9	14
6/17/2002	5	47
7/14/2003	6.2	57
2/23/2004	5.8	54
11/15/2004	6.9	63
8/10/2005	7.4	65
2/27/2006	4.4	35
8/23/2006	3.5	22
2/21/2007	4.6	41
8/22/2007	4.4	36
2/26/2008	4.5	39
8/20/2008	4.9	46
8/11/2009	4.3	34
3/22/2010	5.5	51
8/17/2010	4.4	37
2/22/2011	3	15
8/10/2011	3	16
2/29/2012	3.2	19
8/14/2012	2.8	12
2/19/2013	3	17
8/15/2013	2.4	8
2/25/2014	2.5	11
8/26/2014	1.3	3
2/23/2015	1.7	5
8/19/2015	1.3	4
2/22/2016	1.7	6
9/6/2016	3.4	21
3/6/2017	2.8	13
8/8/2017	3.2	20
2/26/2018	3.8	27
8/29/2018	4.1	32
2/25/2019	4.5	40
8/26/2019	4.7	43

The Wilcoxon Statistic is 676
The Expected value is is 1102.5
The Standard Deviation is 132.122
The Z Score is -3.23186
The Standard Deviation adjusted for ties is 132.122
The Z Score adjusted for ties is -3.23186
-3.23186 < 2.326 indicating no statistical significance at 1% level
-3.23186 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

Manganese

Multi-Well Time-Series Graph



Mann-Kendall Trend Analysis

Parameter: Manganese

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
0.046	0.024	0.022	1	0
0.017	0.024	-0.007	1	1
0.0081	0.024	-0.0159	1	2
0.026	0.024	0.002	2	2
0.0222	0.024	-0.0018	2	3
0.0355	0.024	0.0115	3	3
0.0335	0.024	0.0095	4	3
0.0322	0.024	0.0082	5	3
0.0289	0.024	0.0049	6	3
0.0262	0.024	0.0022	7	3
0.0202	0.024	-0.0038	7	4
0.023	0.024	-0.001	7	5
0.017	0.046	-0.029	7	6
0.0081	0.046	-0.0379	7	7
0.026	0.046	-0.02	7	8
0.0222	0.046	-0.0238	7	9
0.0355	0.046	-0.0105	7	10
0.0335	0.046	-0.0125	7	11
0.0322	0.046	-0.0138	7	12
0.0289	0.046	-0.0171	7	13
0.0262	0.046	-0.0198	7	14
0.0202	0.046	-0.0258	7	15
0.023	0.046	-0.023	7	16
0.0081	0.017	-0.0089	7	17
0.026	0.017	0.009	8	17
0.0222	0.017	0.0052	9	17
0.0355	0.017	0.0185	10	17
0.0335	0.017	0.0165	11	17
0.0322	0.017	0.0152	12	17
0.0289	0.017	0.0119	13	17
0.0262	0.017	0.0092	14	17
0.0202	0.017	0.0032	15	17
0.023	0.017	0.006	16	17
0.026	0.0081	0.0179	17	17
0.0222	0.0081	0.0141	18	17
0.0355	0.0081	0.0274	19	17
0.0335	0.0081	0.0254	20	17
0.0322	0.0081	0.0241	21	17
0.0289	0.0081	0.0208	22	17
0.0262	0.0081	0.0181	23	17
0.0202	0.0081	0.0121	24	17
0.023	0.0081	0.0149	25	17
0.0222	0.026	-0.0038	25	18
0.0355	0.026	0.0095	26	18
0.0335	0.026	0.0075	27	18
0.0322	0.026	0.0062	28	18
0.0289	0.026	0.0029	29	18
0.0262	0.026	0.0002	30	18

0.0202	0.026	-0.0058	30	19
0.023	0.026	-0.003	30	20
0.0355	0.0222	0.0133	31	20
0.0335	0.0222	0.0113	32	20
0.0322	0.0222	0.01	33	20
0.0289	0.0222	0.0067	34	20
0.0262	0.0222	0.004	35	20
0.0202	0.0222	-0.002	35	21
0.023	0.0222	0.0008	36	21
0.0335	0.0355	-0.002	36	22
0.0322	0.0355	-0.0033	36	23
0.0289	0.0355	-0.0066	36	24
0.0262	0.0355	-0.0093	36	25
0.0202	0.0355	-0.0153	36	26
0.023	0.0355	-0.0125	36	27
0.0322	0.0335	-0.0013	36	28
0.0289	0.0335	-0.0046	36	29
0.0262	0.0335	-0.0073	36	30
0.0202	0.0335	-0.0133	36	31
0.023	0.0335	-0.0105	36	32
0.0289	0.0322	-0.0033	36	33
0.0262	0.0322	-0.006	36	34
0.0202	0.0322	-0.012	36	35
0.023	0.0322	-0.0092	36	36
0.0262	0.0289	-0.0027	36	37
0.0202	0.0289	-0.0087	36	38
0.023	0.0289	-0.0059	36	39
0.0202	0.0262	-0.006	36	40
0.023	0.0262	-0.0032	36	41
0.023	0.0202	0.0028	37	41

S Statistic = 37 - 41 = -4

Tied Group	Value	Members

Time Period	Observations
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1
3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0

E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
Z-Score = -0.183027
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.183027| <= 1.97737 indicating no evidence of a trend

Mann-Kendall Trend Analysis

Parameter: Manganese

Location: MW-1

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
0.012	0.0093	0.0027	1	0
0.011	0.0093	0.0017	2	0
0.012	0.0093	0.0027	3	0
0.014	0.0093	0.0047	4	0
0.0129	0.0093	0.0036	5	0
0.0148	0.0093	0.0055	6	0
0.0142	0.0093	0.0049	7	0
0.0159	0.0093	0.0066	8	0
0.0169	0.0093	0.0076	9	0
0.0162	0.0093	0.0069	10	0
0.0181	0.0093	0.0088	11	0
0.0171	0.0093	0.0078	12	0
0.011	0.012	-0.001	12	1
0.012	0.012	0	12	1
0.014	0.012	0.002	13	1
0.0129	0.012	0.0009	14	1
0.0148	0.012	0.0028	15	1
0.0142	0.012	0.0022	16	1
0.0159	0.012	0.0039	17	1
0.0169	0.012	0.0049	18	1
0.0162	0.012	0.0042	19	1
0.0181	0.012	0.0061	20	1
0.0171	0.012	0.0051	21	1
0.012	0.011	0.001	22	1
0.014	0.011	0.003	23	1
0.0129	0.011	0.0019	24	1
0.0148	0.011	0.0038	25	1
0.0142	0.011	0.0032	26	1
0.0159	0.011	0.0049	27	1
0.0169	0.011	0.0059	28	1
0.0162	0.011	0.0052	29	1
0.0181	0.011	0.0071	30	1
0.0171	0.011	0.0061	31	1
0.014	0.012	0.002	32	1
0.0129	0.012	0.0009	33	1
0.0148	0.012	0.0028	34	1
0.0142	0.012	0.0022	35	1
0.0159	0.012	0.0039	36	1
0.0169	0.012	0.0049	37	1
0.0162	0.012	0.0042	38	1
0.0181	0.012	0.0061	39	1
0.0171	0.012	0.0051	40	1
0.0129	0.014	-0.0011	40	2
0.0148	0.014	0.0008	41	2
0.0142	0.014	0.0002	42	2
0.0159	0.014	0.0019	43	2
0.0169	0.014	0.0029	44	2
0.0162	0.014	0.0022	45	2

0.0181	0.014	0.0041	46	2
0.0171	0.014	0.0031	47	2
0.0148	0.0129	0.0019	48	2
0.0142	0.0129	0.0013	49	2
0.0159	0.0129	0.003	50	2
0.0169	0.0129	0.004	51	2
0.0162	0.0129	0.0033	52	2
0.0181	0.0129	0.0052	53	2
0.0171	0.0129	0.0042	54	2
0.0142	0.0148	-0.0006	54	3
0.0159	0.0148	0.0011	55	3
0.0169	0.0148	0.0021	56	3
0.0162	0.0148	0.0014	57	3
0.0181	0.0148	0.0033	58	3
0.0171	0.0148	0.0023	59	3
0.0159	0.0142	0.0017	60	3
0.0169	0.0142	0.0027	61	3
0.0162	0.0142	0.002	62	3
0.0181	0.0142	0.0039	63	3
0.0171	0.0142	0.0029	64	3
0.0169	0.0159	0.001	65	3
0.0162	0.0159	0.0003	66	3
0.0181	0.0159	0.0022	67	3
0.0171	0.0159	0.0012	68	3
0.0162	0.0169	-0.0007	68	4
0.0181	0.0169	0.0012	69	4
0.0171	0.0169	0.0002	70	4
0.0181	0.0162	0.0019	71	4
0.0171	0.0162	0.0009	72	4
0.0171	0.0181	-0.001	72	5

S Statistic = 72 - 5 = 67

Tied Group	Value	Members
1	0.012	2

Time Period	Observations
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1
3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0

D = 0
E = 2
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 267.667
Z-Score = 4.0341
Comparison Level at 95% confidence level = 1.65463 (upward trend)
4.0341 > 1.65463 indicating an upward trend

Mann-Kendall Trend Analysis

Parameter: Manganese

Location: MW-2

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
0.0078	0.0074	0.0004	1	0
0.0072	0.0074	-0.0002	1	1
0.018	0.0074	0.0106	2	1
0.0082	0.0074	0.0008	3	1
0.008	0.0074	0.0006	4	1
0.0077	0.0074	0.0003	5	1
0.0069	0.0074	-0.0005	5	2
0.0075	0.0074	0.0001	6	2
0.0089	0.0074	0.0015	7	2
0.0078	0.0074	0.0004	8	2
0.0106	0.0074	0.0032	9	2
0.0093	0.0074	0.0019	10	2
0.0072	0.0078	-0.0006	10	3
0.018	0.0078	0.0102	11	3
0.0082	0.0078	0.0004	12	3
0.008	0.0078	0.0002	13	3
0.0077	0.0078	-0.0001	13	4
0.0069	0.0078	-0.0009	13	5
0.0075	0.0078	-0.0003	13	6
0.0089	0.0078	0.0011	14	6
0.0078	0.0078	0	14	6
0.0106	0.0078	0.0028	15	6
0.0093	0.0078	0.0015	16	6
0.018	0.0072	0.0108	17	6
0.0082	0.0072	0.001	18	6
0.008	0.0072	0.0008	19	6
0.0077	0.0072	0.0005	20	6
0.0069	0.0072	-0.0003	20	7
0.0075	0.0072	0.0003	21	7
0.0089	0.0072	0.0017	22	7
0.0078	0.0072	0.0006	23	7
0.0106	0.0072	0.0034	24	7
0.0093	0.0072	0.0021	25	7
0.0082	0.018	-0.0098	25	8
0.008	0.018	-0.01	25	9
0.0077	0.018	-0.0103	25	10
0.0069	0.018	-0.0111	25	11
0.0075	0.018	-0.0105	25	12
0.0089	0.018	-0.0091	25	13
0.0078	0.018	-0.0102	25	14
0.0106	0.018	-0.0074	25	15
0.0093	0.018	-0.0087	25	16
0.008	0.0082	-0.0002	25	17
0.0077	0.0082	-0.0005	25	18
0.0069	0.0082	-0.0013	25	19
0.0075	0.0082	-0.0007	25	20
0.0089	0.0082	0.0007	26	20
0.0078	0.0082	-0.0004	26	21

0.0106	0.0082	0.0024	27	21
0.0093	0.0082	0.0011	28	21
0.0077	0.008	-0.0003	28	22
0.0069	0.008	-0.0011	28	23
0.0075	0.008	-0.0005	28	24
0.0089	0.008	0.0009	29	24
0.0078	0.008	-0.0002	29	25
0.0106	0.008	0.0026	30	25
0.0093	0.008	0.0013	31	25
0.0069	0.0077	-0.0008	31	26
0.0075	0.0077	-0.0002	31	27
0.0089	0.0077	0.0012	32	27
0.0078	0.0077	0.0001	33	27
0.0106	0.0077	0.0029	34	27
0.0093	0.0077	0.0016	35	27
0.0075	0.0069	0.0006	36	27
0.0089	0.0069	0.002	37	27
0.0078	0.0069	0.0009	38	27
0.0106	0.0069	0.0037	39	27
0.0093	0.0069	0.0024	40	27
0.0089	0.0075	0.0014	41	27
0.0078	0.0075	0.0003	42	27
0.0106	0.0075	0.0031	43	27
0.0093	0.0075	0.0018	44	27
0.0078	0.0089	-0.0011	44	28
0.0106	0.0089	0.0017	45	28
0.0093	0.0089	0.0004	46	28
0.0106	0.0078	0.0028	47	28
0.0093	0.0078	0.0015	48	28
0.0093	0.0106	-0.0013	48	29

S Statistic = 48 - 29 = 19

Tied Group	Value	Members
1	0.0078	2

Time Period	Observations
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1
3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0

D = 0
E = 2
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 267.667
Z-Score = 1.10021
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.10021| <= 1.97737 indicating no evidence of a trend

Mann-Kendall Trend Analysis

Parameter: Manganese

Location: MW-4

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
0.064	0.2	-0.136	0	1
0.21	0.2	0.01	1	1
0.19	0.2	-0.01	1	2
0.22	0.2	0.02	2	2
0.0698	0.2	-0.1302	2	3
0.0973	0.2	-0.1027	2	4
0.146	0.2	-0.054	2	5
0.0953	0.2	-0.1047	2	6
0.0411	0.2	-0.1589	2	7
0.0593	0.2	-0.1407	2	8
0.0302	0.2	-0.1698	2	9
0.137	0.2	-0.063	2	10
0.21	0.064	0.146	3	10
0.19	0.064	0.126	4	10
0.22	0.064	0.156	5	10
0.0698	0.064	0.0058	6	10
0.0973	0.064	0.0333	7	10
0.146	0.064	0.082	8	10
0.0953	0.064	0.0313	9	10
0.0411	0.064	-0.0229	9	11
0.0593	0.064	-0.0047	9	12
0.0302	0.064	-0.0338	9	13
0.137	0.064	0.073	10	13
0.19	0.21	-0.02	10	14
0.22	0.21	0.01	11	14
0.0698	0.21	-0.1402	11	15
0.0973	0.21	-0.1127	11	16
0.146	0.21	-0.064	11	17
0.0953	0.21	-0.1147	11	18
0.0411	0.21	-0.1689	11	19
0.0593	0.21	-0.1507	11	20
0.0302	0.21	-0.1798	11	21
0.137	0.21	-0.073	11	22
0.22	0.19	0.03	12	22
0.0698	0.19	-0.1202	12	23
0.0973	0.19	-0.0927	12	24
0.146	0.19	-0.044	12	25
0.0953	0.19	-0.0947	12	26
0.0411	0.19	-0.1489	12	27
0.0593	0.19	-0.1307	12	28
0.0302	0.19	-0.1598	12	29
0.137	0.19	-0.053	12	30
0.0698	0.22	-0.1502	12	31
0.0973	0.22	-0.1227	12	32
0.146	0.22	-0.074	12	33
0.0953	0.22	-0.1247	12	34
0.0411	0.22	-0.1789	12	35
0.0593	0.22	-0.1607	12	36

0.0302	0.22	-0.1898	12	37
0.137	0.22	-0.083	12	38
0.0973	0.0698	0.0275	13	38
0.146	0.0698	0.0762	14	38
0.0953	0.0698	0.0255	15	38
0.0411	0.0698	-0.0287	15	39
0.0593	0.0698	-0.0105	15	40
0.0302	0.0698	-0.0396	15	41
0.137	0.0698	0.0672	16	41
0.146	0.0973	0.0487	17	41
0.0953	0.0973	-0.002	17	42
0.0411	0.0973	-0.0562	17	43
0.0593	0.0973	-0.038	17	44
0.0302	0.0973	-0.0671	17	45
0.137	0.0973	0.0397	18	45
0.0953	0.146	-0.0507	18	46
0.0411	0.146	-0.1049	18	47
0.0593	0.146	-0.0867	18	48
0.0302	0.146	-0.1158	18	49
0.137	0.146	-0.009	18	50
0.0411	0.0953	-0.0542	18	51
0.0593	0.0953	-0.036	18	52
0.0302	0.0953	-0.0651	18	53
0.137	0.0953	0.0417	19	53
0.0593	0.0411	0.0182	20	53
0.0302	0.0411	-0.0109	20	54
0.137	0.0411	0.0959	21	54
0.0302	0.0593	-0.0291	21	55
0.137	0.0593	0.0777	22	55
0.137	0.0302	0.1068	23	55

S Statistic = 23 - 55 = -32

Tied Group	Value	Members

Time Period	Observations
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1
3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0

E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
Z-Score = -1.89128
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-1.89128 < -1.65463 indicating a downward trend

Mann-Kendall Trend Analysis

Parameter: Manganese

Location: MW-5

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
0.084	0.06	0.024	1	0
0.057	0.06	-0.003	1	1
0.052	0.06	-0.008	1	2
0.052	0.06	-0.008	1	3
0.0499	0.06	-0.0101	1	4
0.0549	0.06	-0.0051	1	5
0.0521	0.06	-0.0079	1	6
0.0566	0.06	-0.0034	1	7
0.0537	0.06	-0.0063	1	8
0.0564	0.06	-0.0036	1	9
0.0647	0.06	0.0047	2	9
0.0591	0.06	-0.0009	2	10
0.057	0.084	-0.027	2	11
0.052	0.084	-0.032	2	12
0.052	0.084	-0.032	2	13
0.0499	0.084	-0.0341	2	14
0.0549	0.084	-0.0291	2	15
0.0521	0.084	-0.0319	2	16
0.0566	0.084	-0.0274	2	17
0.0537	0.084	-0.0303	2	18
0.0564	0.084	-0.0276	2	19
0.0647	0.084	-0.0193	2	20
0.0591	0.084	-0.0249	2	21
0.052	0.057	-0.005	2	22
0.052	0.057	-0.005	2	23
0.0499	0.057	-0.0071	2	24
0.0549	0.057	-0.0021	2	25
0.0521	0.057	-0.0049	2	26
0.0566	0.057	-0.0004	2	27
0.0537	0.057	-0.0033	2	28
0.0564	0.057	-0.0006	2	29
0.0647	0.057	0.0077	3	29
0.0591	0.057	0.0021	4	29
0.052	0.052	0	4	29
0.0499	0.052	-0.0021	4	30
0.0549	0.052	0.0029	5	30
0.0521	0.052	0.0001	6	30
0.0566	0.052	0.0046	7	30
0.0537	0.052	0.0017	8	30
0.0564	0.052	0.0044	9	30
0.0647	0.052	0.0127	10	30
0.0591	0.052	0.0071	11	30
0.0499	0.052	-0.0021	11	31
0.0549	0.052	0.0029	12	31
0.0521	0.052	0.0001	13	31
0.0566	0.052	0.0046	14	31
0.0537	0.052	0.0017	15	31
0.0564	0.052	0.0044	16	31

0.0647	0.052	0.0127	17	31
0.0591	0.052	0.0071	18	31
0.0549	0.0499	0.005	19	31
0.0521	0.0499	0.0022	20	31
0.0566	0.0499	0.0067	21	31
0.0537	0.0499	0.0038	22	31
0.0564	0.0499	0.0065	23	31
0.0647	0.0499	0.0148	24	31
0.0591	0.0499	0.0092	25	31
0.0521	0.0549	-0.0028	25	32
0.0566	0.0549	0.0017	26	32
0.0537	0.0549	-0.0012	26	33
0.0564	0.0549	0.0015	27	33
0.0647	0.0549	0.0098	28	33
0.0591	0.0549	0.0042	29	33
0.0566	0.0521	0.0045	30	33
0.0537	0.0521	0.0016	31	33
0.0564	0.0521	0.0043	32	33
0.0647	0.0521	0.0126	33	33
0.0591	0.0521	0.007	34	33
0.0537	0.0566	-0.0029	34	34
0.0564	0.0566	-0.0002	34	35
0.0647	0.0566	0.0081	35	35
0.0591	0.0566	0.0025	36	35
0.0564	0.0537	0.0027	37	35
0.0647	0.0537	0.011	38	35
0.0591	0.0537	0.0054	39	35
0.0647	0.0564	0.0083	40	35
0.0591	0.0564	0.0027	41	35
0.0591	0.0647	-0.0056	41	36

S Statistic = 41 - 36 = 5

Tied Group	Value	Members
1	0.052	2

Time Period	Observations
8/15/2013	1
2/25/2014	1
8/26/2014	1
2/23/2015	1
8/19/2015	1
2/22/2016	1
9/6/2016	1
3/6/2017	1
8/8/2017	1
2/26/2018	1
8/29/2018	1
2/25/2019	1
8/26/2019	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0

D = 0
E = 2
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 267.667
Z-Score = 0.244491
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|0.244491| <= 1.97737 indicating no evidence of a trend

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Manganese

Location: MW-1

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0
Non detect rank is 1

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-3	8/15/2013	0.024	19
	2/25/2014	0.046	26
	8/26/2014	0.017	13
	2/23/2015	0.0081	1
	8/19/2015	0.026	20
	2/22/2016	0.0222	17
	9/6/2016	0.0355	25
	3/6/2017	0.0335	24
	8/8/2017	0.0322	23
	2/26/2018	0.0289	22
	8/29/2018	0.0262	21
	2/25/2019	0.0202	16
	8/26/2019	0.023	18
MW-1	8/15/2013	0.0093	2
	2/25/2014	0.012	4
	8/26/2014	0.011	3
	2/23/2015	0.012	5
	8/19/2015	0.014	7
	2/22/2016	0.0129	6
	9/6/2016	0.0148	9
	3/6/2017	0.0142	8
	8/8/2017	0.0159	10
	2/26/2018	0.0169	12
	8/29/2018	0.0162	11
	2/25/2019	0.0181	15
	8/26/2019	0.0171	14

The Wilcoxon Statistic is 15
The Expected value is is 84.5
The Standard Deviation is 19.5
The Z Score is -3.58974
The Standard Deviation adjusted for ties is 19.5
The Z Score adjusted for ties is -3.58974
-3.58974 < 2.326 indicating no statistical significance at 1% level
-3.58974 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Manganese

Location: MW-2

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0
Non detect rank is 1

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-3	8/15/2013	0.024	19
	2/25/2014	0.046	26
	8/26/2014	0.017	14
	2/23/2015	0.0081	9
	8/19/2015	0.026	20
	2/22/2016	0.0222	17
	9/6/2016	0.0355	25
	3/6/2017	0.0335	24
	8/8/2017	0.0322	23
	2/26/2018	0.0289	22
	8/29/2018	0.0262	21
	2/25/2019	0.0202	16
	8/26/2019	0.023	18
MW-2	8/15/2013	0.0074	3
	2/25/2014	0.0078	6
	8/26/2014	0.0072	2
	2/23/2015	0.018	15
	8/19/2015	0.0082	10
	2/22/2016	0.008	8
	9/6/2016	0.0077	5
	3/6/2017	0.0069	1
	8/8/2017	0.0075	4
	2/26/2018	0.0089	11
	8/29/2018	0.0078	7
	2/25/2019	0.0106	13
	8/26/2019	0.0093	12

The Wilcoxon Statistic is 6
The Expected value is is 84.5
The Standard Deviation is 19.5
The Z Score is -4.05128
The Standard Deviation adjusted for ties is 19.5
The Z Score adjusted for ties is -4.05128
-4.05128 < 2.326 indicating no statistical significance at 1% level
-4.05128 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Manganese

Location: MW-4

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0
Non detect rank is 1

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-3	8/15/2013	0.024	6
	2/25/2014	0.046	15
	8/26/2014	0.017	2
	2/23/2015	0.0081	1
	8/19/2015	0.026	7
	2/22/2016	0.0222	4
	9/6/2016	0.0355	13
	3/6/2017	0.0335	12
	8/8/2017	0.0322	11
	2/26/2018	0.0289	9
	8/29/2018	0.0262	8
	2/25/2019	0.0202	3
	8/26/2019	0.023	5
MW-4	8/15/2013	0.2	24
	2/25/2014	0.064	17
	8/26/2014	0.21	25
	2/23/2015	0.19	23
	8/19/2015	0.22	26
	2/22/2016	0.0698	18
	9/6/2016	0.0973	20
	3/6/2017	0.146	22
	8/8/2017	0.0953	19
	2/26/2018	0.0411	14
	8/29/2018	0.0593	16
	2/25/2019	0.0302	10
	8/26/2019	0.137	21

The Wilcoxon Statistic is 164
The Expected value is is 84.5
The Standard Deviation is 19.5
The Z Score is 4.05128
The Standard Deviation adjusted for ties is 19.5
The Z Score adjusted for ties is 4.05128
4.05128 > 2.326 indicating statistical significance at 1% level
4.05128 > 2.326 indicating statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Manganese

Location: MW-5

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0
Non detect rank is 1

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-3	8/15/2013	0.024	6
	2/25/2014	0.046	13
	8/26/2014	0.017	2
	2/23/2015	0.0081	1
	8/19/2015	0.026	7
	2/22/2016	0.0222	4
	9/6/2016	0.0355	12
	3/6/2017	0.0335	11
	8/8/2017	0.0322	10
	2/26/2018	0.0289	9
	8/29/2018	0.0262	8
	2/25/2019	0.0202	3
	8/26/2019	0.023	5
MW-5	8/15/2013	0.06	24
	2/25/2014	0.084	26
	8/26/2014	0.057	22
	2/23/2015	0.052	15
	8/19/2015	0.052	16
	2/22/2016	0.0499	14
	9/6/2016	0.0549	19
	3/6/2017	0.0521	17
	8/8/2017	0.0566	21
	2/26/2018	0.0537	18
	8/29/2018	0.0564	20
	2/25/2019	0.0647	25
	8/26/2019	0.0591	23

The Wilcoxon Statistic is 169
The Expected value is is 84.5
The Standard Deviation is 19.5
The Z Score is 4.30769
The Standard Deviation adjusted for ties is 19.5
The Z Score adjusted for ties is 4.30769
4.30769 > 2.326 indicating statistical significance at 1% level
4.30769 > 2.326 indicating statistical significance at 1% level when adjusted for ties