

October 2, 2020

Ms. Kelly Lee Kinkaid PG; Licensed Professional Geologist

Pennsylvania Department of Environmental Protection
Bureau of Waste Management
909 Elmerton Avenue
Harrisburg, PA 17110-8200

REF: 2nd Quarter 2020 Form 19, 50 and 52 Submittal
Frey Farm Landfill; BWM Permit #101389

Dear Ms. Kinkaid:

In accordance with the Municipal Waste Management Regulations, the Lancaster County Solid Waste Management Authority (LCSWMA) continues the above-referenced monitoring program.

LCSWMA provided the 2nd Quarter 2020 data on July 6, 2020 to ARM Group and then ARM Group has provided an analysis for the groundwater, leachate, and contiguous landowners data. ARM Group's report is attached to this submittal.

Groundwater:

In accordance with the Municipal Waste Management Regulations, the Lancaster County Solid Waste Management Authority (LCSWMA) continues the above-referenced monitoring program.

Attached are the Forms 19 (annual parameters), laboratory reports, and data export excel file for uploading the data into your LandLinks Access database.

Leachate:

In accordance with both the Pennsylvania Municipal Waste Management and the Federal Subtitle D Regulations, the Lancaster County Solid Waste Management Authority (LCSWMA) continues to complete the above referenced monitoring program. Enclosed is the Department's Form 50 - "Municipal Waste Landfill Leachate Analysis" for the quarterly monitoring period.

- LCSWMA continues to monitor the Form 50 parameters from location FFLEINFS. This location is the leachate collection system for the Frey Farm Landfill and represents "raw" leachate characteristics for the facility, as collected from the six (6) landfill cells.

- As indicated on the Form 50, the primary leachate collection and secondary detection systems encompass approximately 93 acres of drainage area.
- At DEP's request, we have included analyses of the four (4) secondary individual detection zone discharges with an individual Form 50 for each.
- Included on the CD are files which contains the FFLEINFS data in a compatible format for your LandLinks software. The CD also contains a pdf file of the laboratory results and the Form 50.

In accordance with Section 273.255(d)(1)(2) and (3) of the Municipal Waste Management Regulations, the Lancaster County Solid Waste Management Authority (LCSWMA) is providing this secondary flow report.

The 2nd Quarter 2020 Frey Farm Landfill (FFLF) secondary flow was noted at 2.56 gallons per day per acre (gpdpa); which is below the regulatory limit of 100 gpdpa. The 2nd Quarter 2020 secondary flow was 1.12% of the primary flow, which is below the regulatory 10% (maximum). Table 1 indicates this quarter's weekly flow information for the six (6) operational cells at the FFLF, cells 2 and 4 continue to indicate no secondary flow present.

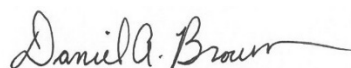
- Consistent with all previous monitoring events, LCSWMA remains well below the secondary leachate flow threshold (100-gpdpa)

Contiguous Landowners:

Attached are the Forms 52, laboratory reports, and a data export excel file for uploading the data into your LandLinks Access database.

Please do not hesitate in contacting me if you have any questions or concerns at dbrown@lcswma.org.

Respectfully submitted,



Daniel A. Brown
Environmental Compliance Manager

Enclosures

Cc: LCSWMA: Environmental, John Ridinger, Aaron Rice
PA DEP: Ed Rawski, Randy Weiss



ARM Group LLC

Engineers and Scientists

October 1, 2020

Mr. Daniel Brown
Environmental Compliance Manager
Lancaster County Solid Waste
Management Authority
1299 Harrisburg Pike
PO Box 4425
Lancaster, PA 17604

Re: LCSWMA Frey Farm Landfill
Permit No. 101389
Manor Township
Lancaster County, Pennsylvania
Second Quarter 2020 Water Quality Data Review
ARM Project 190783

Dear Mr. Brown:

ARM Group LLC (ARM) has prepared this assessment at the request of the Lancaster County Solid Waste Management Authority (LCSWMA) to evaluate the Second Quarter 2020 water quality monitoring results for Frey Farm Landfill (FFLF). As part of this evaluation, ARM reviewed the historic and Second Quarter 2020 laboratory analytical results for the sampled upgradient and downgradient Form 19 groundwater monitoring wells, Form 50 leachate collection and detection zones, and Form 52 contiguous private wells.

The groundwater, leachate, and contiguous private well samples collected by LCSWMA during the Second Quarter 2020 were analyzed for quarterly, annual, and Subtitle D Form 19 parameters; quarterly and annual Form 50 parameters; and quarterly Form 52 parameters. The following narrative provides a summary of noteworthy observations of the results for the Second Quarter of 2020, as well as a general discussion of recent data trends.

Background/Upgradient Parameter Concentrations

To determine if the concentration of a given parameter at each groundwater monitoring location is elevated compared to the background/upgradient concentration, ARM calculated the 95% upper prediction limits (UPLs) using historical data from the upgradient well, FFMP002W (MP-2), using laboratory analytical results provided by LCSWMA from the First Quarter 2009 through the most recent quarter (Second Quarter 2020).

The UPL approach is used to predict the upper limit of possible future values based on a background data set. A 95% UPL established from background data represents the upper limit which will predict if an independently obtained future sample result exceeds background levels with 95% confidence. If the concentration of a given parameter in a downgradient well exceeds its established UPL, this represents a statistically significant exceedance of background groundwater quality.

To calculate the UPLs, ARM first applied the Dixon's and Rosner's Tests for outliers in ChemStat® statistical analysis software (version 6.3.0.2, Starpoint Software, Inc., ©1996-2013) to identify potential historical anomalous concentrations in MP-2. The Dixon's Test applies to populations of 3-25 values, and the Rosner's Test is valid for populations of more than 25 values. ARM identified 44 statistical outliers at a 95% significance level in the historical dataset which did not appear to be part of a long-term concentration trend. No outliers were identified from the Second Quarter 2020 analytical results.

The most appropriate method of calculating a UPL varies according to the distribution of each dataset. After removing outliers, ARM assessed the remaining historical MP-2 concentration data for each parameter to determine the best fitting statistical distribution (i.e., normal, lognormal, gamma or no distribution) at a 95% significance level using the EPA's ProUCL statistical analysis software (version 5.1.002, EPA, 2015). ARM then used ProUCL to calculate the 95% UPLs for each parameter, which are summarized in the enclosed **Attachment 1**. The exported ProUCL statistical calculation sheets are included in the enclosed **Attachment 2**.

For pH, a one-sided UPL is not appropriate because of the double-sided nature of this parameter. ARM assessed the downgradient pH data by investigating time-series concentration plots for identifiable trends and comparing the Second Quarter 2020 results to the historical range of concentrations in both the sampled well and the upgradient well.

The Interstate Technology and Regulatory Council (ITRC) recommends that a UPL should only be applied for background populations of at least 8-10 observations. Use of smaller populations containing either fewer measurements or multiple non-detections can result in skewed datasets and statistically flawed UPL calculations.

The background population is less than 8 for all quarterly volatile organic compounds (VOCs), chemical oxygen demand (COD), dissolved iron, and total phenolics because of a historical lack of detections in MP-2. All annual and Subtitle D Form 19 parameters have a background population of less than 8, except for total and dissolved barium, total and dissolved copper, total and dissolved lead, total and dissolved zinc, cobalt, and nickel. A background level could therefore not be accurately calculated for these parameters, which are labeled with asterisks in the enclosed **Attachment 1**. ARM substituted the laboratory reporting detection limit for the statistical background standard when assessing these parameters in the downgradient wells due to their historical absence in the upgradient groundwater.

The attached **Table 1** summarizes the background exceedances in the downgradient Form 19 wells during the Second Quarter 2020. The attached **Table 2** summarizes the background exceedances in the downgradient Form 52 wells during the Second Quarter 2020. Background



exceedances shown in **Tables 1 and 2** denote a statistically significant increase of concentrations relative to those observed historically in the upgradient well MP-2. Close attention should be paid to results from the monitoring locations with noted water quality changes during future sampling events to evaluate the presence of any positive or negative trends for the parameters of concern.

Individual Form 19 Well Summary

- MP-2 – No parameters are above the statistical background level in this upgradient well for the Second Quarter 2020, indicating that groundwater quality appears relatively stable upgradient of the site. Concentrations of several parameters increased rapidly in 2012 to historical high levels. All these concentrations have returned to apparently stable, long-term trends in line with historical average levels since 2014. pH has fluctuated over a range of approximately 1.0 unit over the past several years but appears to have a stable long-term trend. All other Form 19 analytical parameters appear to be stable and within historical concentration ranges.
- MP-5 – Parameters above background in this well include calcium, chloride, magnesium, sodium, specific conductance (SpC), sulfate, total dissolved solids (TDS), and total organic carbon (TOC). Concentrations of most of these parameters historically appeared stable until an increase in 2018. These concentrations decreased during 2019 and now generally appear in line with the historical averages. Sulfate appears to be slowly increasing over time with minor fluctuations. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.5 unit higher, on average, while fluctuating over a slightly wider range.
- MP-15 – Chloride, magnesium, nitrate, and dissolved sodium were observed above background in this well. Magnesium concentrations appear to be increasing since early 2018. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.6 unit higher, on average, while fluctuating over a slightly wider range.
- MP-16 – Chloride, magnesium, and sodium levels were observed above background in this well. Concentrations of these parameters appear to have a long-term stable trend with short-term fluctuations. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.7 unit higher than background, on average.
- MP-17 – Parameters observed above background in this well include calcium, chloride, magnesium, manganese, sodium, SpC, sulfate, TDS, TOC, and barium. Concentrations of most of these parameters appear to be increasing over time. Two instances of apparent rapid increases in concentration occurred during 2012 and 2016. After both events, these parameter levels have generally stabilized. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.7 unit higher than background.
- MP-18 – Parameters observed above background in this well include chloride, magnesium, and sodium. Concentrations of these parameters appeared to spike during the First Quarter



2018 sampling event but have since returned to near-historical levels. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.4 unit higher, on average.

- MP-19 – Chloride and TDS were observed above background in this well and appear to be increasing slowly in concentration over time. pH appears to mimic the trend observed in the upgradient well at levels approximately 1.5 units higher, on average.
- MP-25 – Chloride and magnesium levels were observed above background in this well. Concentrations of these parameters appear to be fluctuating rapidly over time with a long-term, slowly increasing trend. pH appears to be increasing slowly since 2016 and is currently approximately 1.2 units higher than background.
- MP-28 – Parameters observed above background in this well include chloride, magnesium, and dissolved sodium. Chloride and sodium concentrations appear to be elevated yet stable over time. Magnesium concentrations appear to be decreasing as a long-term trend with occasional fluctuations. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.5 unit higher, on average, while fluctuating over a slightly wider range.
- MP-29 – Chloride levels were observed above background in this well and appear to fluctuate between 20-160 mg/L in a seasonal pattern. However, there does not appear to be a long-term increasing or decreasing trend. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.4 unit higher, on average.
- MP-2DW – Parameters observed above background in this well include calcium, chloride, dissolved iron, magnesium, sodium, SpC, TDS, turbidity, and barium. These parameter concentrations appear to be increasing between the Third Quarter 2017 and Fourth Quarter 2018 sampling events. They generally have stabilized, apart from minor fluctuations, during the last several quarters. pH appears to mimic the trend observed in the upgradient well at levels approximately 2.1 units higher, on average.
- MP-2SW – Parameters observed above background in this well include chloride, iron, sodium, TOC, turbidity, and chromium. Chloride and sodium levels appear to be decreasing over time. Iron, TOC, and turbidity appear to be fluctuating over relatively wide concentration ranges with an apparent slowly increasing long-term trend. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.6 unit higher, on average.
- MP-31 – Iron and turbidity were observed above background in this well. These parameter concentrations appear to be increasing slowly since the First Quarter 2018 sampling event. pH appears to mimic the trend observed in the upgradient well at levels approximately 2.0 units higher, on average, while fluctuating over a wider range.
- MP-32 – Parameters observed above background in this well include ammonia-N, iron, manganese, and turbidity. Ammonia-N appears to be decreasing over time with occasional concentration fluctuations. Iron, manganese, and turbidity appear to be fluctuating rapidly



but do not appear to show a long-term increasing or decreasing trend. pH appears to mimic the trend observed in the upgradient well at levels approximately 1.7 units higher, on average, while fluctuating over a wider range.

- MP-33 – Parameters observed above background in this well include ammonia-N, chloride, iron, and turbidity. Chloride appears to be fluctuating seasonally with a long-term, slowly increasing trend. The other noted parameter concentrations appear to be fluctuating but do not appear to show a long-term increasing or decreasing trend. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.8 unit higher, on average.
- MP-3A – Magnesium levels were observed above background in this well but appear to be steady long-term. pH appears to be increasing slowly over time and is currently approximately 0.3 unit higher than background.
- MP-4A – Parameters observed above background in this well include alkalinity (bicarbonate and total), calcium, chloride, magnesium, sodium, SpC, TDS, barium, and chromium. All these parameter concentrations appear to be either stable over time or decreasing. Calcium and TDS levels appear to be fluctuating within their long-term trends. pH appears to mimic the trend observed in the upgradient well at levels approximately 1.8 units higher, on average, while fluctuating over a slightly wider range.
- MP-26R – Parameters observed above background in this well include chloride, magnesium, manganese, sodium, SpC, sulfate, TDS, TOC, and barium. Most of these parameters appear to be increasing slowly since 2014. Sulfate and TOC appear to be fluctuating but not increasing long-term. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.3 unit higher, on average.
- MP-30R – Parameters observed above background in this well include chloride, magnesium, manganese, sodium, chromium, and mercury. Most of these parameter concentrations appear to be fluctuating across a relatively wide range of values with no apparent long-term trends. Chromium and mercury were observed above the laboratory reporting limit by 0.0001 and 0.00002 mg/L, respectively. ARM will assess future annual sampling results to determine if any identifiable trends develop. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.5 unit higher, on average, while fluctuating over a wider range.

Parameters not noted above are either at or below background levels. Overall, the groundwater quality at FFLF generally appears to be stable. Most parameters noted as being elevated above background levels do not appear to be increasing over time. Several parameters appear to be fluctuating but do not show an apparent long-term increasing or decreasing trend. ARM will continue to closely assess the noted parameters with increasing trends to see if any changes to the trends occur over time.



Form 50 Leachate Zone Summary

ARM reviewed the historic and Second Quarter 2020 laboratory analytical results for sample location FFLEINFS (grab samples collected from the combined flow from FFLF's primary leachate collection lines) and four (4) manholes which represent the secondary leachate detection zones (FFMH01SS, FFMH03SS, FFMH05SS, and FFMH06SS).

The combined primary leachate flow from FFLEINS tends to range between approximately 150-400 gallons per day per acre (gpd/ac) but does not appear to be increasing over time. Flows from the secondary zones appear to fluctuate seasonally, with the highest flows generally occurring in the first quarter and the lowest flows generally occurring in the third quarter. Flow from FFMH01SS tends to range between approximately 5-25 gpd/ac and appears to be decreasing since 2014. Flow from FFMH03SS tends to range between approximately 0.1-4.0 gpd/ac and appears to be increasing since 2018. Flow from FFMH05SS tends to range between approximately 0.1-2.0 gpd/ac and appears to be generally stable except for a short-term spike in the flow rate to 15 gpd/ac in early 2018; FFMH05SS flows have since returned to near-historical levels. Flow from FFMH06SS tends to fluctuate seasonally between approximately 0.2-5.8 gpd/ac but does not appear to be increasing over time.

Form 50 VOC Detections and Apparent Trends

2-butanone (MEK) and acetone were observed in FFLEINS in the Second Quarter 2020 and have been historically present in the primary leachate samples. 2-butanone appears to fluctuate between approximately 30-1,300 µg/L and appears to be gradually decreasing over time. Acetone appears to fluctuate between approximately 50-3,300 µg/L and appears to be gradually decreasing over time.

1,1-dichloroethane, 1,4-dichlorobenzene, benzene, cis-1,2-dichloroethene, ethylbenzene, and xylenes were detected in FFMH01SS and have historically been present at low levels (between 1-7 µg/L). 1,4-dichlorobenzene and ethylbenzene levels appear to be very gradually increasing over time, and the other noted VOC concentrations appear to be either stable or decreasing over time.

Bromomethane was detected in FFMH03SS for the third time since the First Quarter 2019. All detections have been between 1.2-1.3 µg/L, which is only slightly greater than the laboratory detection limit of 1.0 µg/L. ARM will continue to assess further detections to determine if any concentration trends become apparent.

Other Form 50 Detections and Apparent Trends

Ammonia-N, barium, chloride, iron, pH, potassium, sodium, and TOC levels appear to be increasing long-term at FFLEINFS and FFMH01SS. COD, nitrate-N, SpC, sulfate, TDS, and TOC appear to be decreasing at FFMH05SS. Alkalinity, calcium, magnesium, and manganese concentrations fluctuate across a wide range of values in the historical leachate results, but no long-term trends are apparent for these parameters. ARM will continue to closely assess the noted parameters with increasing trends to see if any changes to the trends occur over time.



Form 50 MCL Exceedances and Form 19 Subtitle D Parameter Analysis

Form 19 groundwater monitoring wells are subject to additional analysis of Subtitle D parameters at the next scheduled annual sampling event if secondary leachate samples collected from an upgradient cell are found to exceed the primary maximum contaminant limit (MCL) of a regulated compound. For the Second Quarter 2020, the analyses for the secondary leachate samples collected from FFMH01SS resulted in MCL exceedances for barium, cadmium, fluoride, toluene. Samples collected from FFMH03SS resulted in MCL exceedances for antimony, cadmium, and nitrate. Samples collected from FFMH05SS resulted in MCL exceedances for arsenic, fluoride, and nitrate. Cadmium was detected above the MCL in FFMH06SS. All wells downgradient of these zones should therefore be sampled for Subtitle D Form 19 parameters during the 2021 annual sampling event.

Form 52 Contiguous Private Wells Summary

ARM reviewed the historic and Second Quarter 2020 groundwater monitoring results for ten (10) contiguous privately-owned wells. Samples collected from these wells were analyzed for quarterly Form 52 parameters. The attached **Table 2** summarizes the background exceedances in the downgradient Form 52 wells during the Second Quarter 2020. Background exceedances shown in **Table 2** denote a statistically significant increase of concentrations relative to those observed historically in the upgradient well MP-2.

- 3044RIVERRD – Dissolved magnesium was detected above background but appears to be stable and not increasing over time. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.6 unit higher, on average, while fluctuating over a slightly wider range.
- 3052RIVERRD – No parameters were observed above background in this well. pH appears to be slowly increasing since 2017 and is currently approximately 0.4 unit higher than the upgradient well.
- 3056RIVERRD – Total and dissolved magnesium were detected above background in this well. Concentrations of both parameters appear to be stable and not increasing over time. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.1 unit higher, on average, while fluctuating over a slightly wider range.
- 3060RIVERRD – Total and dissolved magnesium were detected above background in this well. Concentrations of both parameters appear to be stable and not increasing over time. pH appears to mimic the trend observed in the upgradient well at nearly identical levels, on average, while fluctuating over a slightly wider range.
- 3076RIVERRD – Chloride and dissolved sodium were detected above background in this well. Concentrations of both parameters appear to be stable and not increasing over time. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.3 unit higher, on average.



- 3079RIVERRD – Chloride was detected above background in this well. Chloride levels fluctuate in an apparently seasonal manner but do not appear to be increasing over time. pH appears to be slowly increasing since 2017 and is currently approximately 1.3 units higher than the upgradient well.
- 3088RIVERRD – Parameters observed above background in this well include total and bicarbonate alkalinity, chloride, total and dissolved sodium, SpC, and TDS. ARM understands that the property owner at this location installed a water treatment system in 2013 which coincides with several significant changes in parameter concentrations and trends. Notably, alkalinity, chloride, sodium, SpC, and TDS levels increased rapidly, and calcium, magnesium, potassium, and sulfate levels decreased rapidly during 2013. Nitrate-N concentrations initially decreased by about 50% during 2013 but have returned to historical average levels, fluctuating between approximately 7-14 mg/L. pH appears to mimic the trend observed in the upgradient well at levels approximately 1.6 units higher, on average, while fluctuating over a slightly wider range.
- 3100RIVERRD – Ammonia-nitrogen and chloride were detected above background in this well, but concentrations appear to be stable and not increasing over time. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.5 unit higher, on average.
- 3106RIVERRD – Chloride, total and dissolved magnesium, and total and dissolved sodium were observed above background in this well. Concentrations of all these parameters appear to be decreasing over the last two quarters after increasing to a relative peak in the Fourth Quarter 2019. Since late 2015, pH appears to mimic the trend observed in the upgradient well at levels approximately 0.6 unit higher, on average.
- 3125RIVERRD – Parameters observed above background in this well include chloride, total and dissolved magnesium, total and dissolved sodium, SpC, and TDS. Chloride levels fluctuate in an apparently seasonal manner but do not appear to be trending toward an increase over time. Magnesium levels appear to be increasing over the last three quarters. Sodium, SpC, and TDS levels appear to be decreasing since the Second Quarter 2018. pH also appears to be increasing since early 2018 and is currently approximately 2.0 units higher than background.

Form 52 parameters not noted above are either at or below background levels. ARM will continue to assess the noted apparent trends in the Form 52 results to see if any changes in the trends develop.



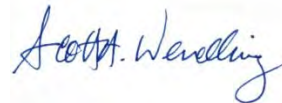
Closing

If you have any questions regarding this water quality data evaluation, please contact the undersigned at 717-533-8600. ARM sincerely appreciates the opportunity to assist LCSWMA with its assessment of quarterly water quality data collected at FFLF.

Sincerely,
ARM Group LLC



Ryan Brandon
Project Hydrogeologist II



Scott Wendling, P.G.
Vice President, Sr. Project Manager

Enclosed: Tables 1-2
Attachments 1-2



TABLES



Table 1. LCSWMA Frey Farm Landfill Form 19 Groundwater Monitoring Well Background Standard Comparisons - 2nd Quarter 2020

| Parameter | Background Standard | Units | FFMP002W | FFMP005W | FFMP015W | FFMP016W | FFMP017W | FFMP018W | FFMP019W | FFMP025W | FFMP028W | FFMP029W | FFMP02DW | FFMP02SW | FFMP031W | FFMP032W | FFMP033W | FFMP03AW | FFMP04AW | FFMP26RW | FFMP30RW |
|------------------------------------|---------------------|-------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <i>Subtitle D Analytes</i> | | | | | | | | | | | | | | | | | | | | | |
| ACETONE | 10* | µg/L | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| ACRYLONITRILE | 5* | µg/L | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| BROMOCHLOROMETHANE | 1* | µg/L | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 |
| BROMODICHLOROMETHANE | 1* | µg/L | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 |
| CARBON DISULFIDE | 1* | µg/L | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 |
| CHLOROFORM | 1* | µg/L | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 |
| 1,2-DIBROMO-3-CHLOROPROPANE (DBCP) | 7* | µg/L | < 7 | < 7 | < 7 | < 7 | < 7 | < 7 | < 7 | < 7 | < 7 | < 7 | < 7 | < 7 | < 7 | < 7 | < 7 | < 7 | < 7 | < 7 | < 7 |
| trans 1,4-DICHLORO-2-BUTENE | 3* | µg/L | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 |
| 2-HEXANONE | 5* | µg/L | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| DIBROMOMETHANE | 1* | µg/L | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 |
| IODOMETHANE | 1* | µg/L | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 |
| STYRENE | 1* | µg/L | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 |
| VINYL ACETATE | 5* | µg/L | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 |
| ANTIMONY | 0.0022* | mg/L | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 |
| BERYLLIUM | 0.0011* | mg/L | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 |
| COBALT | 0.050 | mg/L | 0.01 | < 0.0056 | < 0.0056 | < 0.0056 | 0.05 | 0.0066 | < 0.0056 | < 0.0056 | < 0.0056 | < 0.0056 | < 0.0056 | < 0.0056 | < 0.0056 | < 0.0056 | < 0.0056 | < 0.0056 | < 0.0056 | 0.02 | 0.0084 |
| NICKEL | 0.14 | mg/L | 0.01 | < 0.0056 | 0.0059 | < 0.0056 | 0.0092 | < 0.0056 | < 0.0056 | < 0.0056 | < 0.0056 | < 0.0056 | < 0.0056 | 0.01 | < 0.0056 | < 0.0056 | < 0.0056 | 0.0095 | 0.01 | < 0.0056 | 0.01 |
| THALLIUM | 0.0011* | mg/L | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 | < 0.0011 |
| VANADIUM | 0.0022* | mg/L | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 | < 0.0022 |

Notes:

Gray text indicates a parameter non-detection.

Shaded text indicates a background standard exceedance.

* Reporting limit substituted for background standard due to lack of historical detections in the upgradient well.

** One-sided background standards are not appropriate for pH. Other analysis used in report.

Table 2. LCSWMA Frey Farm Landfill Form 52 Groundwater Monitoring Well Background Standard Comparisons - 2nd Quarter 2020

| Parameter | FFLF Background Standard | Units | 3044 RIVER RD | 3052 RIVER RD | 3056 RIVER RD | 3060 RIVER RD | 3076 RIVER RD | 3079 RIVER RD | 3088 RIVER RD | 3100 RIVER RD | 3106 RIVER RD | 3125 RIVER RD |
|-----------------------------|--------------------------|----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| ALKALINITY | 142 | mg/L | 8 | 10 | | | 10 | 31 | 171 | 18 | 15 | 133 |
| AMMONIA-NITROGEN | 0.31 | mg/L | | | | | | | | 0.60 | | |
| BICARBONATE | 135 | mg/L | 8 | 10 | | | 10 | 31 | 171 | 18 | 15 | 133 |
| CALCIUM, DISSOLVED | 79.4 | mg/L | 14.9 | 16.5 | 12.5 | 11.7 | 14.2 | 10.2 | 0.2 | 16.3 | 21.1 | 73.60 |
| CALCIUM, TOTAL | 72.8 | mg/L | 13.6 | 15.0 | 11.7 | 10.5 | 14.1 | 9.8 | 0.18 | 14.9 | 20.7 | 65.30 |
| CHLORIDE | 30.8 | mg/L | 21.0 | 20.8 | 25.1 | 20.1 | 50.1 | 32.1 | 225 | 44.0 | 110 | 121 |
| IRON, TOTAL | 0.73 | mg/L | | | | | | | | 0.060 | 0.090 | |
| MAGNESIUM, DISSOLVED | 10.9 | mg/L | 11.4 | 10.0 | 14 | 12.2 | 9 | 6.2 | | 7.1 | 15.2 | 13.1 |
| MAGNESIUM, TOTAL | 10.3 | mg/L | 10.3 | 9 | 13 | 10.9 | 8.7 | 5.9 | 0.07 | 6.3 | 14.6 | 11.5 |
| MANGANESE, DISSOLVED | 0.53 | mg/L | 0.020 | 0.050 | 0.080 | 0.12 | 0.18 | 0.17 | | 0.0086 | 0.040 | 0.050 |
| MANGANESE, TOTAL | 0.48 | mg/L | 0.020 | 0.040 | 0.080 | 0.11 | 0.17 | 0.16 | | 0.0099 | 0.050 | 0.050 |
| NITRATE-NITROGEN | 28.6 | mg/L | 18.1 | 17.3 | 19.0 | 14.5 | 9.9 | | 7.5 | 3.7 | 12.4 | 5.9 |
| pH-FIELD | NA | S.U. | 5.78 | 5.69 | 5.46 | 5.49 | 5.39 | 6.87 | 7.57 | 6.42 | 6.37 | 7.28 |
| pH-LAB | NA | S.U. | 5.72 | 5.66 | 5.40 | 5.53 | 5.69 | 6.49 | 7.61 | 6.48 | 5.88 | 7.23 |
| POTASSIUM, DISSOLVED | 11.4 | mg/L | 1.5 | 1.9 | 2.1 | 2.5 | 3.7 | 2.3 | 2.9 | 1.3 | 2.4 | 7.7 |
| POTASSIUM, TOTAL | 13.6 | mg/L | 1.7 | 2.0 | 2.3 | 2.5 | 3.6 | 2.1 | 2.8 | 1.4 | 2.3 | 7.2 |
| SODIUM, DISSOLVED | 21.6 | mg/L | 8.5 | 7.5 | 8.2 | 8.3 | 24.8 | 14.9 | 252 | 16.6 | 47.8 | 60.0 |
| SODIUM, TOTAL | 26.6 | mg/L | 8.5 | 7.4 | 8.3 | 8.3 | 23.6 | 14.1 | 207 | 15.4 | 44.7 | 54.7 |
| SPEC. COND., FIELD | 640 | µmhos/cm | 241 | 228 | 242 | 232 | 259 | 359 | 1,157 | 249 | 395 | 759 |
| SPEC. COND., LAB | 750 | µmhos/cm | 238 | 232 | 236 | 227 | 337 | 192 | 1,170 | 242 | 490 | 752 |
| SULFATE | 71 | mg/L | | 2.3 | | 8.8 | 11.3 | 11.4 | | 8.0 | 6.2 | 15.2 |
| TDS (TOT. DISSOLVED SOLIDS) | 389 | mg/L | 134 | 146 | 192 | 134 | 202 | 134 | 618 | 198 | 364 | 438 |
| TOC (TOTAL ORGANIC CARBON) | 1.34 | mg/L | | | | | 0.75 | | | | | 0.65 |
| TURBIDITY | 4.71 | NTU | | 1.10 | | 0.10 | | | 0.13 | 0.36 | 0.35 | |

Notes:

Blank cells indicate parameter not detected by laboratory.

Shaded text indicates exceedance of a FFLF statistical background standard.

ATTACHMENT 1

BACKGROUND UPPER PREDICTION LIMITS



| LCSWMA FREY FARM LANDFILL | | | |
|---|---------------------|-------------------------------|-------------|
| 2nd Quarter 2020 - Background Upper Prediction Limits (FFMP002W) | | | |
| <i>Form 19 Quarterly Parameters</i> | | | |
| Parameter | Distribution | Upper Prediction Limit | Unit |
| AMMONIA-NITROGEN | Normal | 0.31 | mg/L |
| BICARBONATE | No Distribution | 135 | mg/L |
| CALCIUM, TOTAL | No Distribution | 72.8 | mg/L |
| CALCIUM, DISSOLVED | No Distribution | 79.4 | mg/L |
| COD (CHEMICAL OXYGEN DEMAND) | NA | 15* | mg/L |
| CHLORIDE | Normal | 30.8 | mg/L |
| FLUORIDE | No Distribution | 0.50 | mg/L |
| IRON, TOTAL | No Distribution | 0.73 | mg/L |
| IRON, DISSOLVED | NA | 0.056* | mg/L |
| MAGNESIUM, TOTAL | No Distribution | 10.3 | mg/L |
| MAGNESIUM, DISSOLVED | Normal | 10.9 | mg/L |
| MANGANESE, TOTAL | No Distribution | 0.48 | mg/L |
| MANGANESE, DISSOLVED | Lognormal | 0.53 | mg/L |
| NITRATE-NITROGEN | No Distribution | 28.6 | mg/L |
| pH-FIELD | NA | None** | S.U. |
| pH-LAB | NA | None** | S.U. |
| POTASSIUM, TOTAL | No Distribution | 13.6 | mg/L |
| POTASSIUM, DISSOLVED | No Distribution | 11.4 | mg/L |
| SODIUM, TOTAL | No Distribution | 26.6 | mg/L |
| SODIUM, DISSOLVED | Normal | 21.6 | mg/L |
| SPEC. COND., FIELD | No Distribution | 640 | µmhos/cm |
| SPEC. COND., LAB | No Distribution | 750 | µmhos/cm |
| SULFATE | No Distribution | 70.6 | mg/L |
| TOTAL ALKALINITY | No Distribution | 142 | mg/L |
| TDS (TOTAL DISSOLVED SOLIDS) | Lognormal | 389 | mg/L |
| TOC (TOTAL ORGANIC CARBON) | Normal | 1.34 | mg/L |
| TOTAL PHENOLICS | NA | 0.005* | mg/L |
| TURBIDITY | No Distribution | 4.71 | NTU |
| BENZENE | NA | 1* | µg/L |
| 1,2-DIBROMOETHANE | NA | 1* | µg/L |
| 1,1-DICHLOROETHANE | NA | 1* | µg/L |
| 1,1-DICHLOROETHENE | NA | 1* | µg/L |
| 1,2-DICHLOROETHANE | NA | 1* | µg/L |
| cis 1,2-DICHLOROETHENE | NA | 1* | µg/L |
| trans 1,2-DICHLOROETHENE | NA | 1* | µg/L |
| ETHYLBENZENE | NA | 1* | µg/L |
| METHYLENE CHLORIDE | NA | 1* | µg/L |
| TETRACHLOROETHENE | NA | 1* | µg/L |
| TOLUENE | NA | 1* | µg/L |
| 1,1,1-TRICHLOROETHANE | NA | 1* | µg/L |
| TRICHLOROETHENE | NA | 1* | µg/L |
| VINYL CHLORIDE | NA | 1* | µg/L |
| XYLENES (TOTAL) | NA | 3* | µg/L |

| LCSWMA FREY FARM LANDFILL | | | |
|---|---------------------|-------------------------------|-------------|
| 2nd Quarter 2020 - Background Upper Prediction Limits (FFMP002W) | | | |
| <i>Form 19 Annual Parameters</i> | | | |
| Parameter | Distribution | Upper Prediction Limit | Unit |
| ARSENIC, TOTAL | NA | 0.0033* | mg/L |
| ARSENIC, DISSOLVED | NA | 0.0030* | mg/L |
| BARIUM, TOTAL | Normal | 0.088 | mg/L |
| BARIUM, DISSOLVED | Normal | 0.088 | mg/L |
| CADMIUM, TOTAL | NA | 0.0011* | mg/L |
| CADMIUM, DISSOLVED | NA | 0.0011* | mg/L |
| CHROMIUM, TOTAL | NA | 0.0022* | mg/L |
| CHROMIUM, DISSOLVED | NA | 0.0022* | mg/L |
| COPPER, TOTAL | No Distribution | 0.030 | mg/L |
| COPPER, DISSOLVED | No Distribution | 0.030 | mg/L |
| LEAD-FLAMELESS, TOTAL | Lognormal | 0.014 | mg/L |
| LEAD, DISSOLVED | No Distribution | 0.010 | mg/L |
| MERCURY, TOTAL | NA | 0.00050* | mg/L |
| MERCURY, DISSOLVED | NA | 0.00050* | mg/L |
| SELENIUM, TOTAL | NA | 0.0056* | mg/L |
| SELENIUM, DISSOLVED | NA | 0.0056* | mg/L |
| SILVER, TOTAL | NA | 0.0022* | mg/L |
| SILVER, DISSOLVED | NA | 0.0022* | mg/L |
| ZINC, TOTAL | Lognormal | 0.098 | mg/L |
| ZINC, DISSOLVED | Lognormal | 0.088 | mg/L |
| BROMOFORM | NA | 1* | µg/L |
| BROMOMETHANE | NA | 1* | µg/L |
| CARBON TETRACHLORIDE | NA | 1* | µg/L |
| CHLOROETHANE | NA | 1* | µg/L |
| CHLOROBENZENE | NA | 1* | µg/L |
| DIBROMOCHLOROMETHANE | NA | 1* | µg/L |
| CHLOROMETHANE | NA | 1* | µg/L |
| 3-CHLORO-1-PROPENE | NA | 1* | µg/L |
| 1,2-DICHLOROBENZENE | NA | 1* | µg/L |
| 1,3-DICHLOROBENZENE | NA | 1* | µg/L |
| 1,4-DICHLOROBENZENE | NA | 1* | µg/L |
| DICHLORODIFLUOROMETHANE | NA | 1* | µg/L |
| 1,2-DICHLOROPROPANE | NA | 1* | µg/L |
| cis 1,3-DICHLOROPROPENE | NA | 1* | µg/L |
| trans 1,3-DICHLOROPROPENE | NA | 1* | µg/L |
| 2-BUTANONE (MEK) | NA | 10* | µg/L |
| 4-METHYL-2-PENTANONE | NA | 5* | µg/L |
| 1,1,1,2-TETRACHLOROETHANE | NA | 1* | µg/L |
| 1,1,2,2-TETRACHLOROETHANE | NA | 1* | µg/L |
| 1,1,2-TRICHLOROETHANE | NA | 1* | µg/L |
| TRICHLOROFLUOROMETHANE | NA | 1* | µg/L |
| 1,2,3-TRICHLOROPROPANE | NA | 2* | µg/L |

| LCSWMA FREY FARM LANDFILL | | | |
|---|---------------------|-------------------------------|-------------|
| 2nd Quarter 2020 - Background Upper Prediction Limits (FFMP002W) | | | |
| <i>Form 19 Subtitle D Parameters</i> | | | |
| Parameter | Distribution | Upper Prediction Limit | Unit |
| ACETONE | NA | 10* | µg/L |
| ACRYLONITRILE | NA | 5* | µg/L |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHANE) | NA | 1* | µg/L |
| BROMODICHLOROMETHANE | NA | 1* | µg/L |
| CARBON DISULFIDE | NA | 1* | µg/L |
| CHLOROFORM | NA | 1* | µg/L |
| 1,2-DIBROMO-3-CHLOROPROPANE | NA | 7* | µg/L |
| TRANS-1,4-DICHLORO-2-BUTENE | NA | 3* | µg/L |
| 2-HEXANONE | NA | 5* | µg/L |
| DIBROMOMETHANE | NA | 1* | µg/L |
| IODOMETHANE | NA | 1* | µg/L |
| STYRENE | NA | 1* | µg/L |
| VINYL ACETATE | NA | 5* | µg/L |
| ANTIMONY | NA | 0.0022* | mg/L |
| BERYLLIUM | NA | 0.0011* | mg/L |
| COBALT | No Distribution | 0.050 | mg/L |
| NICKEL | Lognormal | 0.14 | mg/L |
| THALLIUM | NA | 0.0011* | mg/L |
| VANADIUM | NA | 0.0022* | mg/L |

Notes:

"NA" denotes parameter not detected or not enough detections in upgradient well over course of historical data to develop tolerance limits.

* Reporting limit substituted for background standard due to lack of historical detections.

** One-sided background standards are not appropriate for pH. Other analysis used in report.

ATTACHMENT 2

STATISTICAL CALCULATION SHEETS



| | A | B | C | D | E | F | G | H | I | J | K | L |
|----|---|---|---|---|---|---|---|---|---|--------|---|---|
| 1 | | | | Background Statistics for Data Sets with Non-Detects | | | | | | | | |
| 2 | User Selected Options | | | | | | | | | | | |
| 3 | Date/Time of Computation | | | ProUCL 5.19/30/2020 2:23:06 PM | | | | | | | | |
| 4 | From File | | | FFMP002W ProUCL Input 20Q2.xls | | | | | | | | |
| 5 | Full Precision | | | OFF | | | | | | | | |
| 6 | Confidence Coefficient | | | 95% | | | | | | | | |
| 7 | Coverage | | | 95% | | | | | | | | |
| 8 | Different or Future K Observations | | | 1 | | | | | | | | |
| 9 | Number of Bootstrap Operations | | | 2000 | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | AMMONIA-NITROGEN | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | General Statistics | | | | | | | | | | | |
| 14 | Total Number of Observations | | | 46 | | | Number of Missing Observations | | | 0 | | |
| 15 | Number of Distinct Observations | | | 7 | | | | | | | | |
| 16 | Number of Detects | | | 7 | | | Number of Non-Detects | | | 39 | | |
| 17 | Number of Distinct Detects | | | 7 | | | Number of Distinct Non-Detects | | | 1 | | |
| 18 | Minimum Detect | | | 0.1 | | | Minimum Non-Detect | | | 0.1 | | |
| 19 | Maximum Detect | | | 0.63 | | | Maximum Non-Detect | | | 0.1 | | |
| 20 | Variance Detected | | | 0.0395 | | | Percent Non-Detects | | | 84.78% | | |
| 21 | Mean Detected | | | 0.304 | | | SD Detected | | | 0.199 | | |
| 22 | Mean of Detected Logged Data | | | -1.389 | | | SD of Detected Logged Data | | | 0.699 | | |
| 23 | | | | | | | | | | | | |
| 24 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 25 | Tolerance Factor K (For UTL) | | | 2.079 | | | d2max (for USL) | | | 2.924 | | |
| 26 | | | | | | | | | | | | |
| 27 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 28 | Shapiro Wilk Test Statistic | | | 0.904 | | | Shapiro Wilk GOF Test | | | | | |
| 29 | 5% Shapiro Wilk Critical Value | | | 0.803 | | | Detected Data appear Normal at 5% Significance Level | | | | | |
| 30 | Lilliefors Test Statistic | | | 0.254 | | | Lilliefors GOF Test | | | | | |
| 31 | 5% Lilliefors Critical Value | | | 0.304 | | | Detected Data appear Normal at 5% Significance Level | | | | | |
| 32 | Detected Data appear Normal at 5% Significance Level | | | | | | | | | | | |
| 33 | | | | | | | | | | | | |
| 34 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 35 | KM Mean | | | 0.131 | | | KM SD | | | 0.103 | | |
| 36 | 95% UTL95% Coverage | | | 0.345 | | | 95% KM UPL (t) | | | 0.305 | | |
| 37 | 90% KM Percentile (z) | | | 0.263 | | | 95% KM Percentile (z) | | | 0.3 | | |
| 38 | 99% KM Percentile (z) | | | 0.37 | | | 95% KM USL | | | 0.431 | | |
| 39 | | | | | | | | | | | | |
| 40 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 41 | Mean | | | 0.0887 | | | SD | | | 0.117 | | |
| 42 | 95% UTL95% Coverage | | | 0.333 | | | 95% UPL (t) | | | 0.288 | | |
| 43 | 90% Percentile (z) | | | 0.239 | | | 95% Percentile (z) | | | 0.282 | | |
| 44 | 99% Percentile (z) | | | 0.362 | | | 95% USL | | | 0.432 | | |
| 45 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | |
| 46 | | | | | | | | | | | | |
| 47 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | |
| 48 | A-D Test Statistic | | | 0.319 | | | Anderson-Darling GOF Test | | | | | |
| 49 | 5% A-D Critical Value | | | 0.713 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 50 | K-S Test Statistic | | | 0.212 | | | Kolmogorov-Smirnov GOF | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | |
|-----|---|---|---|---|--------|---|-----------------------|---|---|--------|-------|-------|--|
| 51 | 5% K-S Critical Value | | | | 0.314 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | | |
| 52 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | | | | | | | |
| 53 | | | | | | | | | | | | | |
| 54 | Gamma Statistics on Detected Data Only | | | | | | | | | | | | |
| 55 | k hat (MLE) | | | | 2.665 | k star (bias corrected MLE) | | | | 1.618 | | | |
| 56 | Theta hat (MLE) | | | | 0.114 | Theta star (bias corrected MLE) | | | | 0.188 | | | |
| 57 | nu hat (MLE) | | | | 37.3 | nu star (bias corrected) | | | | 22.65 | | | |
| 58 | MLE Mean (bias corrected) | | | | 0.304 | | | | | | | | |
| 59 | MLE Sd (bias corrected) | | | | 0.239 | 95% Percentile of Chisquare (2kstar) | | | | 8.22 | | | |
| 60 | | | | | | | | | | | | | |
| 61 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | | |
| 62 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | | |
| 63 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | | |
| 64 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | | |
| 65 | This is especially true when the sample size is small. | | | | | | | | | | | | |
| 66 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | | |
| 67 | Minimum | | | | 0.01 | Mean | | | | 0.0548 | | | |
| 68 | Maximum | | | | 0.63 | Median | | | | 0.01 | | | |
| 69 | SD | | | | 0.129 | CV | | | | 2.358 | | | |
| 70 | k hat (MLE) | | | | 0.521 | k star (bias corrected MLE) | | | | 0.502 | | | |
| 71 | Theta hat (MLE) | | | | 0.105 | Theta star (bias corrected MLE) | | | | 0.109 | | | |
| 72 | nu hat (MLE) | | | | 47.93 | nu star (bias corrected) | | | | 46.14 | | | |
| 73 | MLE Mean (bias corrected) | | | | 0.0548 | MLE Sd (bias corrected) | | | | 0.0774 | | | |
| 74 | 95% Percentile of Chisquare (2kstar) | | | | 3.849 | 90% Percentile | | | | 0.148 | | | |
| 75 | 95% Percentile | | | | 0.21 | 99% Percentile | | | | 0.363 | | | |
| 76 | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | | | | | |
| 77 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | |
| 78 | | | | | WH | HW | | | | | WH | HW | |
| 79 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.242 | 0.231 | 95% Approx. Gamma UPL | | | | 0.176 | 0.163 | |
| 80 | 95% Gamma USL | | | | 0.444 | 0.456 | | | | | | | |
| 81 | | | | | | | | | | | | | |
| 82 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | | |
| 83 | Mean (KM) | | | | 0.131 | SD (KM) | | | | 0.103 | | | |
| 84 | Variance (KM) | | | | 0.0105 | SE of Mean (KM) | | | | 0.0163 | | | |
| 85 | k hat (KM) | | | | 1.631 | k star (KM) | | | | 1.539 | | | |
| 86 | nu hat (KM) | | | | 150.1 | nu star (KM) | | | | 141.6 | | | |
| 87 | theta hat (KM) | | | | 0.0804 | theta star (KM) | | | | 0.0852 | | | |
| 88 | 80% gamma percentile (KM) | | | | 0.202 | 90% gamma percentile (KM) | | | | 0.271 | | | |
| 89 | 95% gamma percentile (KM) | | | | 0.339 | 99% gamma percentile (KM) | | | | 0.49 | | | |
| 90 | | | | | | | | | | | | | |
| 91 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | | |
| 92 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | |
| 93 | | | | | WH | HW | | | | | WH | HW | |
| 94 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.296 | 0.29 | 95% Approx. Gamma UPL | | | | 0.255 | 0.249 | |
| 95 | 95% KM Gamma Percentile | | | | 0.25 | 0.244 | 95% Gamma USL | | | | 0.401 | 0.397 | |
| 96 | | | | | | | | | | | | | |
| 97 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | | |
| 98 | Shapiro Wilk Test Statistic | | | | 0.935 | Shapiro Wilk GOF Test | | | | | | | |
| 99 | 5% Shapiro Wilk Critical Value | | | | 0.803 | Detected Data appear Lognormal at 5% Significance Level | | | | | | | |
| 100 | Lilliefors Test Statistic | | | | 0.19 | Lilliefors GOF Test | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|-----|--|---|---|---|--------|---|---|---|---|---|--------|---|
| 101 | 5% Lilliefors Critical Value | | | | 0.304 | | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 102 | Detected Data appear Lognormal at 5% Significance Level | | | | | | | | | | | |
| 103 | | | | | | | | | | | | |
| 104 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | |
| 105 | Mean in Original Scale | | | | 0.0612 | | Mean in Log Scale | | | | -4.341 | |
| 106 | SD in Original Scale | | | | 0.128 | | SD in Log Scale | | | | 1.884 | |
| 107 | 95% UTL95% Coverage | | | | 0.655 | | 95% BCA UTL95% Coverage | | | | 0.46 | |
| 108 | 95% Bootstrap (%) UTL95% Coverage | | | | 0.588 | | 95% UPL (t) | | | | 0.319 | |
| 109 | 90% Percentile (z) | | | | 0.146 | | 95% Percentile (z) | | | | 0.289 | |
| 110 | 99% Percentile (z) | | | | 1.043 | | 95% USL | | | | 3.215 | |
| 111 | | | | | | | | | | | | |
| 112 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | |
| 113 | KM Mean of Logged Data | | | | -2.164 | | 95% KM UTL (Lognormal)95% Coverage | | | | 0.272 | |
| 114 | KM SD of Logged Data | | | | 0.414 | | 95% KM UPL (Lognormal) | | | | 0.232 | |
| 115 | 95% KM Percentile Lognormal (z) | | | | 0.227 | | 95% KM USL (Lognormal) | | | | 0.386 | |
| 116 | | | | | | | | | | | | |
| 117 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 118 | Mean in Original Scale | | | | 0.0887 | | Mean in Log Scale | | | | -2.751 | |
| 119 | SD in Original Scale | | | | 0.117 | | SD in Log Scale | | | | 0.637 | |
| 120 | 95% UTL95% Coverage | | | | 0.24 | | 95% UPL (t) | | | | 0.188 | |
| 121 | 90% Percentile (z) | | | | 0.144 | | 95% Percentile (z) | | | | 0.182 | |
| 122 | 99% Percentile (z) | | | | 0.281 | | 95% USL | | | | 0.411 | |
| 123 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 124 | | | | | | | | | | | | |
| 125 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 126 | Data appear to follow a Discernible Distribution at 5% Significance Level | | | | | | | | | | | |
| 127 | | | | | | | | | | | | |
| 128 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 129 | Order of Statistic, r | | | | 45 | | 95% UTL with95% Coverage | | | | 0.46 | |
| 130 | Approx, f used to compute achieved CC | | | | 1.184 | | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.677 | |
| 131 | Approximate Sample Size needed to achieve specified CC | | | | 93 | | 95% UPL | | | | 0.443 | |
| 132 | 95% USL | | | | 0.63 | | 95% KM Chebyshev UPL | | | | 0.583 | |
| 133 | | | | | | | | | | | | |
| 134 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 135 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 136 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 137 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 138 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | BICARBONATE | | | | | | | | | | | |
| 141 | | | | | | | | | | | | |
| 142 | General Statistics | | | | | | | | | | | |
| 143 | Total Number of Observations | | | | 46 | | Number of Missing Observations | | | | 0 | |
| 144 | Number of Distinct Observations | | | | 14 | | | | | | | |
| 145 | Number of Detects | | | | 20 | | Number of Non-Detects | | | | 26 | |
| 146 | Number of Distinct Detects | | | | 14 | | Number of Distinct Non-Detects | | | | 1 | |
| 147 | Minimum Detect | | | | 5 | | Minimum Non-Detect | | | | 5 | |
| 148 | Maximum Detect | | | | 182 | | Maximum Non-Detect | | | | 5 | |
| 149 | Variance Detected | | | | 2624 | | Percent Non-Detects | | | | 56.52% | |
| 150 | Mean Detected | | | | 36.65 | | SD Detected | | | | 51.23 | |

| | | | | | | | | | | | | |
|-----|---|---|---|-------|---|--|----------------------------|---|---|-------|-------|-------|
| | A | B | C | D | E | F | G | H | I | J | K | L |
| 151 | Mean of Detected Logged Data | | | | | 2.823 | SD of Detected Logged Data | | | | | 1.241 |
| 152 | | | | | | | | | | | | |
| 153 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 154 | Tolerance Factor K (For UTL) | | | | 2.079 | d2max (for USL) | | | | | 2.924 | |
| 155 | | | | | | | | | | | | |
| 156 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 157 | Shapiro Wilk Test Statistic | | | | 0.673 | Shapiro Wilk GOF Test | | | | | | |
| 158 | 5% Shapiro Wilk Critical Value | | | | 0.905 | Data Not Normal at 5% Significance Level | | | | | | |
| 159 | Lilliefors Test Statistic | | | | 0.268 | Lilliefors GOF Test | | | | | | |
| 160 | 5% Lilliefors Critical Value | | | | 0.192 | Data Not Normal at 5% Significance Level | | | | | | |
| 161 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 162 | | | | | | | | | | | | |
| 163 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 164 | KM Mean | | | 18.76 | KM SD | | | | | 36.47 | | |
| 165 | 95% UTL95% Coverage | | | 94.59 | 95% KM UPL (t) | | | | | 80.67 | | |
| 166 | 90% KM Percentile (z) | | | 65.5 | 95% KM Percentile (z) | | | | | 78.75 | | |
| 167 | 99% KM Percentile (z) | | | 103.6 | 95% KM USL | | | | | 125.4 | | |
| 168 | | | | | | | | | | | | |
| 169 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 170 | Mean | | | 17.35 | SD | | | | | 37.43 | | |
| 171 | 95% UTL95% Coverage | | | 95.18 | 95% UPL (t) | | | | | 80.89 | | |
| 172 | 90% Percentile (z) | | | 65.32 | 95% Percentile (z) | | | | | 78.91 | | |
| 173 | 99% Percentile (z) | | | 104.4 | 95% USL | | | | | 126.8 | | |
| 174 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | |
| 177 | A-D Test Statistic | | | 1.343 | Anderson-Darling GOF Test | | | | | | | |
| 178 | 5% A-D Critical Value | | | 0.779 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | |
| 179 | K-S Test Statistic | | | 0.251 | Kolmogorov-Smirnov GOF | | | | | | | |
| 180 | 5% K-S Critical Value | | | 0.201 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | |
| 181 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 182 | | | | | | | | | | | | |
| 183 | Gamma Statistics on Detected Data Only | | | | | | | | | | | |
| 184 | k hat (MLE) | | | 0.767 | k star (bias corrected MLE) | | | | | 0.685 | | |
| 185 | Theta hat (MLE) | | | 47.81 | Theta star (bias corrected MLE) | | | | | 53.51 | | |
| 186 | nu hat (MLE) | | | 30.66 | nu star (bias corrected) | | | | | 27.4 | | |
| 187 | MLE Mean (bias corrected) | | | 36.65 | | | | | | | | |
| 188 | MLE Sd (bias corrected) | | | 44.28 | 95% Percentile of Chisquare (2kstar) | | | | | 4.699 | | |
| 189 | | | | | | | | | | | | |
| 190 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | |
| 191 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 192 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | |
| 193 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | |
| 194 | This is especially true when the sample size is small. | | | | | | | | | | | |
| 195 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 196 | Minimum | | | 0.01 | Mean | | | | | 15.94 | | |
| 197 | Maximum | | | 182 | Median | | | | | 0.01 | | |
| 198 | SD | | | 38.02 | CV | | | | | 2.385 | | |
| 199 | k hat (MLE) | | | 0.18 | k star (bias corrected MLE) | | | | | 0.183 | | |
| 200 | Theta hat (MLE) | | | 88.36 | Theta star (bias corrected MLE) | | | | | 87.04 | | |

| | | | | | | | | | | | | |
|-----|--|---|---|---|-------|---|---|---|---|-------|---|-------|
| | A | B | C | D | E | F | G | H | I | J | K | L |
| 251 | 99% Percentile (z) | | | | 105 | 95% USL | | | | | | 221.7 |
| 252 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 253 | | | | | | | | | | | | |
| 254 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 255 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 256 | | | | | | | | | | | | |
| 257 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 258 | Order of Statistic, r | | | | 45 | 95% UTL with 95% Coverage | | | | | | 154 |
| 259 | Approx, f used to compute achieved CC | | | | 1.184 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | | 0.677 |
| 260 | Approximate Sample Size needed to achieve specified CC | | | | 93 | 95% UPL | | | | | | 135.1 |
| 261 | 95% USL | | | | 182 | 95% KM Chebyshev UPL | | | | | | 179.4 |
| 262 | | | | | | | | | | | | |
| 263 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 264 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 265 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 266 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 267 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 268 | | | | | | | | | | | | |
| 269 | CALCIUM, TOTAL | | | | | | | | | | | |
| 270 | | | | | | | | | | | | |
| 271 | General Statistics | | | | | | | | | | | |
| 272 | Total Number of Observations | | | | 45 | Number of Distinct Observations | | | | 39 | | |
| 273 | | | | | | Number of Missing Observations | | | | 1 | | |
| 274 | Minimum | | | | 18.4 | First Quartile | | | | 20.9 | | |
| 275 | Second Largest | | | | 74.7 | Median | | | | 23.1 | | |
| 276 | Maximum | | | | 93 | Third Quartile | | | | 24.9 | | |
| 277 | Mean | | | | 27.66 | SD | | | | 15.14 | | |
| 278 | Coefficient of Variation | | | | 0.547 | Skewness | | | | 3.143 | | |
| 279 | Mean of logged Data | | | | 3.238 | SD of logged Data | | | | 0.356 | | |
| 280 | | | | | | | | | | | | |
| 281 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 282 | Tolerance Factor K (For UTL) | | | | 2.085 | d2max (for USL) | | | | 2.915 | | |
| 283 | | | | | | | | | | | | |
| 284 | Normal GOF Test | | | | | | | | | | | |
| 285 | Shapiro Wilk Test Statistic | | | | 0.533 | Shapiro Wilk GOF Test | | | | | | |
| 286 | 5% Shapiro Wilk Critical Value | | | | 0.945 | Data Not Normal at 5% Significance Level | | | | | | |
| 287 | Lilliefors Test Statistic | | | | 0.353 | Lilliefors GOF Test | | | | | | |
| 288 | 5% Lilliefors Critical Value | | | | 0.131 | Data Not Normal at 5% Significance Level | | | | | | |
| 289 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 290 | | | | | | | | | | | | |
| 291 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 292 | 95% UTL with 95% Coverage | | | | 59.23 | 90% Percentile (z) | | | | 47.06 | | |
| 293 | 95% UPL (t) | | | | 53.38 | 95% Percentile (z) | | | | 52.56 | | |
| 294 | 95% USL | | | | 71.79 | 99% Percentile (z) | | | | 62.88 | | |
| 295 | | | | | | | | | | | | |
| 296 | Gamma GOF Test | | | | | | | | | | | |
| 297 | A-D Test Statistic | | | | 6.356 | Anderson-Darling Gamma GOF Test | | | | | | |
| 298 | 5% A-D Critical Value | | | | 0.752 | Data Not Gamma Distributed at 5% Significance Level | | | | | | |
| 299 | K-S Test Statistic | | | | 0.311 | Kolmogorov-Smirnov Gamma GOF Test | | | | | | |
| 300 | 5% K-S Critical Value | | | | 0.132 | Data Not Gamma Distributed at 5% Significance Level | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|-----|--|---|---|---|-------|---|---|---|---|---|-------|---|
| 301 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 302 | | | | | | | | | | | | |
| 303 | Gamma Statistics | | | | | | | | | | | |
| 304 | k hat (MLE) | | | | 6.249 | | k star (bias corrected MLE) | | | | 5.848 | |
| 305 | Theta hat (MLE) | | | | 4.426 | | Theta star (bias corrected MLE) | | | | 4.73 | |
| 306 | nu hat (MLE) | | | | 562.5 | | nu star (bias corrected) | | | | 526.3 | |
| 307 | MLE Mean (bias corrected) | | | | 27.66 | | MLE Sd (bias corrected) | | | | 11.44 | |
| 308 | | | | | | | | | | | | |
| 309 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 310 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | | 48.78 | | 90% Percentile | | | | 42.96 | |
| 311 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | 48.24 | | 95% Percentile | | | | 48.76 | |
| 312 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | 55.33 | | 99% Percentile | | | | 60.94 | |
| 313 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | 54.87 | | | | | | | |
| 314 | 95% WH USL | | | | 71.32 | | 95% HW USL | | | | 71.41 | |
| 315 | | | | | | | | | | | | |
| 316 | Lognormal GOF Test | | | | | | | | | | | |
| 317 | Shapiro Wilk Test Statistic | | | | 0.679 | | Shapiro Wilk Lognormal GOF Test | | | | | |
| 318 | 5% Shapiro Wilk Critical Value | | | | 0.945 | | Data Not Lognormal at 5% Significance Level | | | | | |
| 319 | Lilliefors Test Statistic | | | | 0.281 | | Lilliefors Lognormal GOF Test | | | | | |
| 320 | 5% Lilliefors Critical Value | | | | 0.131 | | Data Not Lognormal at 5% Significance Level | | | | | |
| 321 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 322 | | | | | | | | | | | | |
| 323 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 324 | 95% UTL with 95% Coverage | | | | 53.57 | | 90% Percentile (z) | | | | 40.23 | |
| 325 | 95% UPL (t) | | | | 46.68 | | 95% Percentile (z) | | | | 45.8 | |
| 326 | 95% USL | | | | 72.02 | | 99% Percentile (z) | | | | 58.39 | |
| 327 | | | | | | | | | | | | |
| 328 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 329 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 330 | | | | | | | | | | | | |
| 331 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 332 | Order of Statistic, r | | | | 44 | | 95% UTL with 95% Coverage | | | | 74.7 | |
| 333 | Approx, f used to compute achieved CC | | | | 1.158 | | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.665 | |
| 334 | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | 93 | |
| 335 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | 89.34 | | 95% BCA Bootstrap UTL with 95% Coverage | | | | 84.94 | |
| 336 | 95% UPL | | | | 72.78 | | 90% Percentile | | | | 34.54 | |
| 337 | 90% Chebyshev UPL | | | | 73.58 | | 95% Percentile | | | | 65.18 | |
| 338 | 95% Chebyshev UPL | | | | 94.38 | | 99% Percentile | | | | 84.95 | |
| 339 | 95% USL | | | | 93 | | | | | | | |
| 340 | | | | | | | | | | | | |
| 341 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 342 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 343 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 344 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 345 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 346 | | | | | | | | | | | | |
| 347 | CALCIUM, DISSOLVED | | | | | | | | | | | |
| 348 | | | | | | | | | | | | |
| 349 | General Statistics | | | | | | | | | | | |
| 350 | Total Number of Observations | | | | 12 | | Number of Distinct Observations | | | | 11 | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|-----|---|---|---|---|--|-------|---|---|---|---|---|-------|
| 351 | | | | | | | | | | Number of Missing Observations | | 34 |
| 352 | | | | | Minimum | 18.3 | | | | First Quartile | | 20.73 |
| 353 | | | | | Second Largest | 26.6 | | | | Median | | 23.4 |
| 354 | | | | | Maximum | 79.4 | | | | Third Quartile | | 24.9 |
| 355 | | | | | Mean | 27.18 | | | | SD | | 16.69 |
| 356 | | | | | Coefficient of Variation | 0.614 | | | | Skewness | | 3.285 |
| 357 | | | | | Mean of logged Data | 3.208 | | | | SD of logged Data | | 0.389 |
| 358 | | | | | | | | | | | | |
| 359 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 360 | | | | | Tolerance Factor K (For UTL) | 2.736 | | | | d2max (for USL) | | 2.285 |
| 361 | | | | | | | | | | | | |
| 362 | Normal GOF Test | | | | | | | | | | | |
| 363 | | | | | Shapiro Wilk Test Statistic | 0.487 | | | | Shapiro Wilk GOF Test | | |
| 364 | | | | | 5% Shapiro Wilk Critical Value | 0.859 | | | | Data Not Normal at 5% Significance Level | | |
| 365 | | | | | Lilliefors Test Statistic | 0.43 | | | | Lilliefors GOF Test | | |
| 366 | | | | | 5% Lilliefors Critical Value | 0.243 | | | | Data Not Normal at 5% Significance Level | | |
| 367 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 368 | | | | | | | | | | | | |
| 369 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 370 | | | | | 95% UTL with 95% Coverage | 72.84 | | | | 90% Percentile (z) | | 48.56 |
| 371 | | | | | 95% UPL (t) | 58.37 | | | | 95% Percentile (z) | | 54.63 |
| 372 | | | | | 95% USL | 65.31 | | | | 99% Percentile (z) | | 66 |
| 373 | | | | | | | | | | | | |
| 374 | Gamma GOF Test | | | | | | | | | | | |
| 375 | | | | | A-D Test Statistic | 1.988 | | | | Anderson-Darling Gamma GOF Test | | |
| 376 | | | | | 5% A-D Critical Value | 0.732 | | | | Data Not Gamma Distributed at 5% Significance Level | | |
| 377 | | | | | K-S Test Statistic | 0.379 | | | | Kolmogorov-Smirnov Gamma GOF Test | | |
| 378 | | | | | 5% K-S Critical Value | 0.246 | | | | Data Not Gamma Distributed at 5% Significance Level | | |
| 379 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 380 | | | | | | | | | | | | |
| 381 | Gamma Statistics | | | | | | | | | | | |
| 382 | | | | | k hat (MLE) | 5.469 | | | | k star (bias corrected MLE) | | 4.157 |
| 383 | | | | | Theta hat (MLE) | 4.969 | | | | Theta star (bias corrected MLE) | | 6.537 |
| 384 | | | | | nu hat (MLE) | 131.3 | | | | nu star (bias corrected) | | 99.78 |
| 385 | | | | | MLE Mean (bias corrected) | 27.18 | | | | MLE Sd (bias corrected) | | 13.33 |
| 386 | | | | | | | | | | | | |
| 387 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 388 | | | | | 95% Wilson Hilferty (WH) Approx. Gamma UPL | 53.58 | | | | 90% Percentile | | 45.04 |
| 389 | | | | | 95% Hawkins Wixley (HW) Approx. Gamma UPL | 52.97 | | | | 95% Percentile | | 52.14 |
| 390 | | | | | 95% WH Approx. Gamma UTL with 95% Coverage | 71.75 | | | | 99% Percentile | | 67.29 |
| 391 | | | | | 95% HW Approx. Gamma UTL with 95% Coverage | 71.69 | | | | | | |
| 392 | | | | | 95% WH USL | 61.85 | | | | 95% HW USL | | 61.42 |
| 393 | | | | | | | | | | | | |
| 394 | Lognormal GOF Test | | | | | | | | | | | |
| 395 | | | | | Shapiro Wilk Test Statistic | 0.643 | | | | Shapiro Wilk Lognormal GOF Test | | |
| 396 | | | | | 5% Shapiro Wilk Critical Value | 0.859 | | | | Data Not Lognormal at 5% Significance Level | | |
| 397 | | | | | Lilliefors Test Statistic | 0.342 | | | | Lilliefors Lognormal GOF Test | | |
| 398 | | | | | 5% Lilliefors Critical Value | 0.243 | | | | Data Not Lognormal at 5% Significance Level | | |
| 399 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 400 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | |
|-----|---|---|---|---|-------|---|---|---|--|---|---------------------------|---|-------|
| 401 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | | |
| 402 | 95% UTL with 95% Coverage | | | | 71.76 | | | | | | 90% Percentile (z) | | 40.73 |
| 403 | 95% UPL (t) | | | | 51.21 | | | | | | 95% Percentile (z) | | 46.92 |
| 404 | 95% USL | | | | 60.2 | | | | | | 99% Percentile (z) | | 61.18 |
| 405 | | | | | | | | | | | | | |
| 406 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | | |
| 407 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | | |
| 408 | | | | | | | | | | | | | |
| 409 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | | |
| 410 | Order of Statistic, r | | | | 12 | | | | | | 95% UTL with 95% Coverage | | 79.4 |
| 411 | Approx, f used to compute achieved CC | | | | 0.632 | | Approximate Actual Confidence Coefficient achieved by UTL | | | | | | 0.46 |
| 412 | | | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | 59 |
| 413 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | 79.4 | | 95% BCA Bootstrap UTL with 95% Coverage | | | | | | 79.4 |
| 414 | 95% UPL | | | | 79.4 | | | | | | 90% Percentile | | 26.55 |
| 415 | 90% Chebyshev UPL | | | | 79.29 | | | | | | 95% Percentile | | 50.36 |
| 416 | 95% Chebyshev UPL | | | | 102.9 | | | | | | 99% Percentile | | 73.59 |
| 417 | 95% USL | | | | 79.4 | | | | | | | | |
| 418 | | | | | | | | | | | | | |
| 419 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | | |
| 420 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | | |
| 421 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | | |
| 422 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | | |
| 423 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | | |
| 424 | | | | | | | | | | | | | |
| 425 | COD (CHEMICAL OXYGEN DEMAND) | | | | | | | | | | | | |
| 426 | | | | | | | | | | | | | |
| 427 | General Statistics | | | | | | | | | | | | |
| 428 | Total Number of Observations | | | | 46 | | Number of Missing Observations | | | | 0 | | |
| 429 | Number of Distinct Observations | | | | 4 | | | | | | | | |
| 430 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 46 | | |
| 431 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 4 | | |
| 432 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 5 | | |
| 433 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 75 | | |
| 434 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | | |
| 435 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | | |
| 436 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | | |
| 437 | | | | | | | | | | | | | |
| 438 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | | |
| 439 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | | |
| 440 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | | |
| 441 | | | | | | | | | | | | | |
| 442 | The data set for variable COD (CHEMICAL OXYGEN DEMAND) was not processed! | | | | | | | | | | | | |
| 443 | | | | | | | | | | | | | |
| 444 | | | | | | | | | | | | | |
| 445 | CHLORIDE | | | | | | | | | | | | |
| 446 | | | | | | | | | | | | | |
| 447 | General Statistics | | | | | | | | | | | | |
| 448 | Total Number of Observations | | | | 46 | | Number of Distinct Observations | | | | 40 | | |
| 449 | Minimum | | | | 19.6 | | First Quartile | | | | 22.3 | | |
| 450 | Second Largest | | | | 34.3 | | Median | | | | 24.95 | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|-----|--|---|---|---|--|--------|---|---|---|---|---|-------|
| 451 | | | | | Maximum | 34.5 | | | | | Third Quartile | 26.48 |
| 452 | | | | | Mean | 24.91 | | | | | SD | 3.437 |
| 453 | | | | | Coefficient of Variation | 0.138 | | | | | Skewness | 0.974 |
| 454 | | | | | Mean of logged Data | 3.207 | | | | | SD of logged Data | 0.132 |
| 455 | | | | | | | | | | | | |
| 456 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 457 | | | | | Tolerance Factor K (For UTL) | 2.079 | | | | | d2max (for USL) | 2.924 |
| 458 | | | | | | | | | | | | |
| 459 | Normal GOF Test | | | | | | | | | | | |
| 460 | | | | | Shapiro Wilk Test Statistic | 0.922 | | | | | Shapiro Wilk GOF Test | |
| 461 | | | | | 5% Shapiro Wilk Critical Value | 0.945 | | | | | Data Not Normal at 5% Significance Level | |
| 462 | | | | | Lilliefors Test Statistic | 0.108 | | | | | Lilliefors GOF Test | |
| 463 | | | | | 5% Lilliefors Critical Value | 0.129 | | | | | Data appear Normal at 5% Significance Level | |
| 464 | Data appear Approximate Normal at 5% Significance Level | | | | | | | | | | | |
| 465 | | | | | | | | | | | | |
| 466 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 467 | | | | | 95% UTL with 95% Coverage | 32.06 | | | | | 90% Percentile (z) | 29.32 |
| 468 | | | | | 95% UPL (t) | 30.75 | | | | | 95% Percentile (z) | 30.57 |
| 469 | | | | | 95% USL | 34.96 | | | | | 99% Percentile (z) | 32.91 |
| 470 | | | | | | | | | | | | |
| 471 | Gamma GOF Test | | | | | | | | | | | |
| 472 | | | | | A-D Test Statistic | 0.571 | | | | | Anderson-Darling Gamma GOF Test | |
| 473 | | | | | 5% A-D Critical Value | 0.747 | | | | | Detected data appear Gamma Distributed at 5% Significance Level | |
| 474 | | | | | K-S Test Statistic | 0.0902 | | | | | Kolmogorov-Smirnov Gamma GOF Test | |
| 475 | | | | | 5% K-S Critical Value | 0.13 | | | | | Detected data appear Gamma Distributed at 5% Significance Level | |
| 476 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 477 | | | | | | | | | | | | |
| 478 | Gamma Statistics | | | | | | | | | | | |
| 479 | | | | | k hat (MLE) | 57.03 | | | | | k star (bias corrected MLE) | 53.32 |
| 480 | | | | | Theta hat (MLE) | 0.437 | | | | | Theta star (bias corrected MLE) | 0.467 |
| 481 | | | | | nu hat (MLE) | 5246 | | | | | nu star (bias corrected) | 4906 |
| 482 | | | | | MLE Mean (bias corrected) | 24.91 | | | | | MLE Sd (bias corrected) | 3.412 |
| 483 | | | | | | | | | | | | |
| 484 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 485 | | | | | 95% Wilson Hilferty (WH) Approx. Gamma UPL | 30.84 | | | | | 90% Percentile | 29.37 |
| 486 | | | | | 95% Hawkins Wixley (HW) Approx. Gamma UPL | 30.86 | | | | | 95% Percentile | 30.78 |
| 487 | | | | | 95% WH Approx. Gamma UTL with 95% Coverage | 32.34 | | | | | 99% Percentile | 33.53 |
| 488 | | | | | 95% HW Approx. Gamma UTL with 95% Coverage | 32.38 | | | | | | |
| 489 | | | | | 95% WH USL | 35.81 | | | | | 95% HW USL | 35.94 |
| 490 | | | | | | | | | | | | |
| 491 | Lognormal GOF Test | | | | | | | | | | | |
| 492 | | | | | Shapiro Wilk Test Statistic | 0.952 | | | | | Shapiro Wilk Lognormal GOF Test | |
| 493 | | | | | 5% Shapiro Wilk Critical Value | 0.945 | | | | | Data appear Lognormal at 5% Significance Level | |
| 494 | | | | | Lilliefors Test Statistic | 0.0853 | | | | | Lilliefors Lognormal GOF Test | |
| 495 | | | | | 5% Lilliefors Critical Value | 0.129 | | | | | Data appear Lognormal at 5% Significance Level | |
| 496 | Data appear Lognormal at 5% Significance Level | | | | | | | | | | | |
| 497 | | | | | | | | | | | | |
| 498 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 499 | | | | | 95% UTL with 95% Coverage | 32.52 | | | | | 90% Percentile (z) | 29.26 |
| 500 | | | | | 95% UPL (t) | 30.92 | | | | | 95% Percentile (z) | 30.7 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|-----|--|---|---|--|---------|-------|---|---|---|---|--------------------|--------|
| 501 | | | | | 95% USL | 36.37 | | | | | 99% Percentile (z) | 33.6 |
| 502 | | | | | | | | | | | | |
| 503 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 504 | Data appear Approximate Normal at 5% Significance Level | | | | | | | | | | | |
| 505 | | | | | | | | | | | | |
| 506 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 507 | | | | Order of Statistic, r | 45 | | | | | 95% UTL with 95% Coverage | | 34.3 |
| 508 | | | | Approx, f used to compute achieved CC | 1.184 | | | | | Approximate Actual Confidence Coefficient achieved by UTL | | 0.677 |
| 509 | | | | | | | | | | Approximate Sample Size needed to achieve specified CC | | 93 |
| 510 | | | | 95% Percentile Bootstrap UTL with 95% Coverage | 34.45 | | | | | 95% BCA Bootstrap UTL with 95% Coverage | | 34.45 |
| 511 | | | | 95% UPL | 33.71 | | | | | 90% Percentile | | 28.45 |
| 512 | | | | 90% Chebyshev UPL | 35.34 | | | | | 95% Percentile | | 31.98 |
| 513 | | | | 95% Chebyshev UPL | 40.06 | | | | | 99% Percentile | | 34.41 |
| 514 | | | | 95% USL | 34.5 | | | | | | | |
| 515 | | | | | | | | | | | | |
| 516 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 517 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 518 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 519 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 520 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 521 | | | | | | | | | | | | |
| 522 | FLUORIDE | | | | | | | | | | | |
| 523 | | | | | | | | | | | | |
| 524 | General Statistics | | | | | | | | | | | |
| 525 | | | | Total Number of Observations | 45 | | | | | Number of Missing Observations | | 1 |
| 526 | | | | Number of Distinct Observations | 7 | | | | | | | |
| 527 | | | | Number of Detects | 15 | | | | | Number of Non-Detects | | 30 |
| 528 | | | | Number of Distinct Detects | 6 | | | | | Number of Distinct Non-Detects | | 2 |
| 529 | | | | Minimum Detect | 0.12 | | | | | Minimum Non-Detect | | 0.2 |
| 530 | | | | Maximum Detect | 0.24 | | | | | Maximum Non-Detect | | 0.5 |
| 531 | | | | Variance Detected | 0.00157 | | | | | Percent Non-Detects | | 66.67% |
| 532 | | | | Mean Detected | 0.157 | | | | | SD Detected | | 0.0396 |
| 533 | | | | Mean of Detected Logged Data | -1.881 | | | | | SD of Detected Logged Data | | 0.237 |
| 534 | | | | | | | | | | | | |
| 535 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 536 | | | | Tolerance Factor K (For UTL) | 2.085 | | | | | d2max (for USL) | | 2.915 |
| 537 | | | | | | | | | | | | |
| 538 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 539 | | | | Shapiro Wilk Test Statistic | 0.807 | | | | | Shapiro Wilk GOF Test | | |
| 540 | | | | 5% Shapiro Wilk Critical Value | 0.881 | | | | | Data Not Normal at 5% Significance Level | | |
| 541 | | | | Lilliefors Test Statistic | 0.263 | | | | | Lilliefors GOF Test | | |
| 542 | | | | 5% Lilliefors Critical Value | 0.22 | | | | | Data Not Normal at 5% Significance Level | | |
| 543 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 544 | | | | | | | | | | | | |
| 545 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 546 | | | | KM Mean | 0.143 | | | | | KM SD | | 0.0296 |
| 547 | | | | 95% UTL95% Coverage | 0.204 | | | | | 95% KM UPL (t) | | 0.193 |
| 548 | | | | 90% KM Percentile (z) | 0.181 | | | | | 95% KM Percentile (z) | | 0.191 |
| 549 | | | | 99% KM Percentile (z) | 0.212 | | | | | 95% KM USL | | 0.229 |
| 550 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | | | | |
|-----|---|---|---|---|--------------|---|---|---|-----------------------|---|---------|---|--------|--|-------|--|
| 551 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | | | | | |
| 552 | Mean | | | | 0.159 | | | | | | SD | | 0.0647 | | | |
| 553 | 95% UTL | | | | 95% Coverage | | 0.294 | | 95% UPL (t) | | | | 0.269 | | | |
| 554 | 90% Percentile (z) | | | | 0.242 | | 95% Percentile (z) | | | | 0.265 | | | | | |
| 555 | 99% Percentile (z) | | | | 0.309 | | 95% USL | | | | 0.347 | | | | | |
| 556 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | | | | | |
| 557 | | | | | | | | | | | | | | | | |
| 558 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | | | | | |
| 559 | A-D Test Statistic | | | | 1.282 | | Anderson-Darling GOF Test | | | | | | | | | |
| 560 | 5% A-D Critical Value | | | | 0.735 | | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | |
| 561 | K-S Test Statistic | | | | 0.254 | | Kolmogorov-Smirnov GOF | | | | | | | | | |
| 562 | 5% K-S Critical Value | | | | 0.221 | | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | |
| 563 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | | | | | |
| 564 | | | | | | | | | | | | | | | | |
| 565 | Gamma Statistics on Detected Data Only | | | | | | | | | | | | | | | |
| 566 | k hat (MLE) | | | | 18.4 | | k star (bias corrected MLE) | | | | 14.76 | | | | | |
| 567 | Theta hat (MLE) | | | | 0.00852 | | Theta star (bias corrected MLE) | | | | 0.0106 | | | | | |
| 568 | nu hat (MLE) | | | | 551.9 | | nu star (bias corrected) | | | | 442.9 | | | | | |
| 569 | MLE Mean (bias corrected) | | | | 0.157 | | | | | | | | | | | |
| 570 | MLE Sd (bias corrected) | | | | 0.0408 | | 95% Percentile of Chisquare (2kstar) | | | | 43.19 | | | | | |
| 571 | | | | | | | | | | | | | | | | |
| 572 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | | | | | |
| 573 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | | | | | |
| 574 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | | | | | |
| 575 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | | | | | |
| 576 | This is especially true when the sample size is small. | | | | | | | | | | | | | | | |
| 577 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | | | | | |
| 578 | Minimum | | | | 0.0911 | | Mean | | | | 0.145 | | | | | |
| 579 | Maximum | | | | 0.24 | | Median | | | | 0.139 | | | | | |
| 580 | SD | | | | 0.0319 | | CV | | | | 0.221 | | | | | |
| 581 | k hat (MLE) | | | | 22.47 | | k star (bias corrected MLE) | | | | 20.99 | | | | | |
| 582 | Theta hat (MLE) | | | | 0.00643 | | Theta star (bias corrected MLE) | | | | 0.00689 | | | | | |
| 583 | nu hat (MLE) | | | | 2023 | | nu star (bias corrected) | | | | 1889 | | | | | |
| 584 | MLE Mean (bias corrected) | | | | 0.145 | | MLE Sd (bias corrected) | | | | 0.0316 | | | | | |
| 585 | 95% Percentile of Chisquare (2kstar) | | | | 58.1 | | 90% Percentile | | | | 0.186 | | | | | |
| 586 | 95% Percentile | | | | 0.2 | | 99% Percentile | | | | 0.228 | | | | | |
| 587 | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | | | | | | | | |
| 588 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | | | | |
| 589 | | | | | WH | | HW | | | | | | WH | | HW | |
| 590 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.216 | | 0.217 | | 95% Approx. Gamma UPL | | | | 0.201 | | 0.201 | |
| 591 | 95% Gamma USL | | | | 0.251 | | 0.254 | | | | | | | | | |
| 592 | | | | | | | | | | | | | | | | |
| 593 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | | | | | |
| 594 | Mean (KM) | | | | 0.143 | | SD (KM) | | | | 0.0296 | | | | | |
| 595 | Variance (KM) | | | | 8.7653E-4 | | SE of Mean (KM) | | | | 0.00573 | | | | | |
| 596 | k hat (KM) | | | | 23.22 | | k star (KM) | | | | 21.69 | | | | | |
| 597 | nu hat (KM) | | | | 2090 | | nu star (KM) | | | | 1952 | | | | | |
| 598 | theta hat (KM) | | | | 0.00614 | | theta star (KM) | | | | 0.00658 | | | | | |
| 599 | 80% gamma percentile (KM) | | | | 0.168 | | 90% gamma percentile (KM) | | | | 0.183 | | | | | |
| 600 | 95% gamma percentile (KM) | | | | 0.197 | | 99% gamma percentile (KM) | | | | 0.223 | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|-----|--|---|---|---|-------|--------|---|---|---|---|-------|--------|
| 601 | | | | | | | | | | | | |
| 602 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | |
| 603 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | |
| 604 | | | | | | WH | HW | | | | WH | HW |
| 605 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.204 | 0.204 | 95% Approx. Gamma UPL | | | | 0.191 | 0.191 |
| 606 | 95% KM Gamma Percentile | | | | 0.189 | 0.189 | 95% Gamma USL | | | | 0.234 | 0.234 |
| 607 | | | | | | | | | | | | |
| 608 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | |
| 609 | Shapiro Wilk Test Statistic | | | | | 0.828 | Shapiro Wilk GOF Test | | | | | |
| 610 | 5% Shapiro Wilk Critical Value | | | | | 0.881 | Data Not Lognormal at 5% Significance Level | | | | | |
| 611 | Lilliefors Test Statistic | | | | | 0.24 | Lilliefors GOF Test | | | | | |
| 612 | 5% Lilliefors Critical Value | | | | | 0.22 | Data Not Lognormal at 5% Significance Level | | | | | |
| 613 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 614 | | | | | | | | | | | | |
| 615 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | |
| 616 | Mean in Original Scale | | | | | 0.145 | Mean in Log Scale | | | | | -1.952 |
| 617 | SD in Original Scale | | | | | 0.0304 | SD in Log Scale | | | | | 0.198 |
| 618 | 95% UTL95% Coverage | | | | | 0.214 | 95% BCA UTL95% Coverage | | | | | 0.2 |
| 619 | 95% Bootstrap (%) UTL95% Coverage | | | | | 0.232 | 95% UPL (t) | | | | | 0.199 |
| 620 | 90% Percentile (z) | | | | | 0.183 | 95% Percentile (z) | | | | | 0.197 |
| 621 | 99% Percentile (z) | | | | | 0.225 | 95% USL | | | | | 0.253 |
| 622 | | | | | | | | | | | | |
| 623 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | |
| 624 | KM Mean of Logged Data | | | | | -1.965 | 95% KM UTL (Lognormal)95% Coverage | | | | | 0.204 |
| 625 | KM SD of Logged Data | | | | | 0.18 | 95% KM UPL (Lognormal) | | | | | 0.19 |
| 626 | 95% KM Percentile Lognormal (z) | | | | | 0.189 | 95% KM USL (Lognormal) | | | | | 0.237 |
| 627 | | | | | | | | | | | | |
| 628 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 629 | Mean in Original Scale | | | | | 0.159 | Mean in Log Scale | | | | | -1.918 |
| 630 | SD in Original Scale | | | | | 0.0647 | SD in Log Scale | | | | | 0.395 |
| 631 | 95% UTL95% Coverage | | | | | 0.335 | 95% UPL (t) | | | | | 0.287 |
| 632 | 90% Percentile (z) | | | | | 0.244 | 95% Percentile (z) | | | | | 0.281 |
| 633 | 99% Percentile (z) | | | | | 0.368 | 95% USL | | | | | 0.465 |
| 634 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 635 | | | | | | | | | | | | |
| 636 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 637 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 638 | | | | | | | | | | | | |
| 639 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 640 | Order of Statistic, r | | | | | 44 | 95% UTL with95% Coverage | | | | | 0.5 |
| 641 | Approx, f used to compute achieved CC | | | | | 1.158 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.665 |
| 642 | Approximate Sample Size needed to achieve specified CC | | | | | 93 | 95% UPL | | | | | 0.5 |
| 643 | 95% USL | | | | | 0.5 | 95% KM Chebyshev UPL | | | | | 0.273 |
| 644 | | | | | | | | | | | | |
| 645 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 646 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 647 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 648 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 649 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 650 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 651 | IRON, TOTAL | | | | | | | | | | | |
| 652 | | | | | | | | | | | | |
| 653 | General Statistics | | | | | | | | | | | |
| 654 | Total Number of Observations | | | | 46 | | Number of Missing Observations | | | | 0 | |
| 655 | Number of Distinct Observations | | | | 14 | | | | | | | |
| 656 | Number of Detects | | | | 16 | | Number of Non-Detects | | | | 30 | |
| 657 | Number of Distinct Detects | | | | 12 | | Number of Distinct Non-Detects | | | | 2 | |
| 658 | Minimum Detect | | | | 0.07 | | Minimum Non-Detect | | | | 0.05 | |
| 659 | Maximum Detect | | | | 1.8 | | Maximum Non-Detect | | | | 0.06 | |
| 660 | Variance Detected | | | | 0.201 | | Percent Non-Detects | | | | 65.22% | |
| 661 | Mean Detected | | | | 0.311 | | SD Detected | | | | 0.448 | |
| 662 | Mean of Detected Logged Data | | | | -1.672 | | SD of Detected Logged Data | | | | 0.883 | |
| 663 | | | | | | | | | | | | |
| 664 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 665 | Tolerance Factor K (For UTL) | | | | 2.079 | | d2max (for USL) | | | | 2.924 | |
| 666 | | | | | | | | | | | | |
| 667 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 668 | Shapiro Wilk Test Statistic | | | | 0.548 | | Shapiro Wilk GOF Test | | | | | |
| 669 | 5% Shapiro Wilk Critical Value | | | | 0.887 | | Data Not Normal at 5% Significance Level | | | | | |
| 670 | Lilliefors Test Statistic | | | | 0.347 | | Lilliefors GOF Test | | | | | |
| 671 | 5% Lilliefors Critical Value | | | | 0.213 | | Data Not Normal at 5% Significance Level | | | | | |
| 672 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 673 | | | | | | | | | | | | |
| 674 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 675 | KM Mean | | 0.141 | | KM SD | | 0.284 | | | | | |
| 676 | 95% UTL95% Coverage | | 0.732 | | 95% KM UPL (t) | | 0.624 | | | | | |
| 677 | 90% KM Percentile (z) | | 0.505 | | 95% KM Percentile (z) | | 0.609 | | | | | |
| 678 | 99% KM Percentile (z) | | 0.802 | | 95% KM USL | | 0.972 | | | | | |
| 679 | | | | | | | | | | | | |
| 680 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 681 | Mean | | 0.128 | | SD | | 0.292 | | | | | |
| 682 | 95% UTL95% Coverage | | 0.735 | | 95% UPL (t) | | 0.623 | | | | | |
| 683 | 90% Percentile (z) | | 0.502 | | 95% Percentile (z) | | 0.608 | | | | | |
| 684 | 99% Percentile (z) | | 0.807 | | 95% USL | | 0.981 | | | | | |
| 685 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | |
| 686 | | | | | | | | | | | | |
| 687 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | |
| 688 | A-D Test Statistic | | 1.779 | | Anderson-Darling GOF Test | | | | | | | |
| 689 | 5% A-D Critical Value | | 0.761 | | Data Not Gamma Distributed at 5% Significance Level | | | | | | | |
| 690 | K-S Test Statistic | | 0.294 | | Kolmogorov-Smirnov GOF | | | | | | | |
| 691 | 5% K-S Critical Value | | 0.221 | | Data Not Gamma Distributed at 5% Significance Level | | | | | | | |
| 692 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 693 | | | | | | | | | | | | |
| 694 | Gamma Statistics on Detected Data Only | | | | | | | | | | | |
| 695 | k hat (MLE) | | 1.131 | | k star (bias corrected MLE) | | 0.961 | | | | | |
| 696 | Theta hat (MLE) | | 0.275 | | Theta star (bias corrected MLE) | | 0.323 | | | | | |
| 697 | nu hat (MLE) | | 36.2 | | nu star (bias corrected) | | 30.74 | | | | | |
| 698 | MLE Mean (bias corrected) | | 0.311 | | | | | | | | | |
| 699 | MLE Sd (bias corrected) | | 0.317 | | 95% Percentile of Chisquare (2kstar) | | 5.838 | | | | | |
| 700 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | | | | |
|-----|---|---|---|---|--------|---|-------|---|---|---|---|---|-------|--|-------|--|
| 701 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | | | | | |
| 702 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | | | | | |
| 703 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | | | | | |
| 704 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | | | | | |
| 705 | This is especially true when the sample size is small. | | | | | | | | | | | | | | | |
| 706 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | | | | | |
| 707 | Minimum | | | | 0.01 | | | | Mean | | | | | | | |
| 708 | Maximum | | | | 1.8 | | | | Median | | | | | | | |
| 709 | SD | | | | 0.297 | | | | CV | | | | | | | |
| 710 | k hat (MLE) | | | | 0.455 | | | | k star (bias corrected MLE) | | | | | | | |
| 711 | Theta hat (MLE) | | | | 0.252 | | | | Theta star (bias corrected MLE) | | | | | | | |
| 712 | nu hat (MLE) | | | | 41.82 | | | | nu star (bias corrected) | | | | | | | |
| 713 | MLE Mean (bias corrected) | | | | 0.115 | | | | MLE Sd (bias corrected) | | | | | | | |
| 714 | 95% Percentile of Chisquare (2kstar) | | | | 3.534 | | | | 90% Percentile | | | | | | | |
| 715 | 95% Percentile | | | | 0.461 | | | | 99% Percentile | | | | | | | |
| 716 | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | | | | | | | | |
| 717 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | | | | |
| 718 | | | | | WH | | HW | | | | | | WH | | HW | |
| 719 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.537 | | 0.537 | | 95% Approx. Gamma UPL | | | | 0.385 | | 0.37 | |
| 720 | 95% Gamma USL | | | | 1.003 | | 1.103 | | | | | | | | | |
| 721 | | | | | | | | | | | | | | | | |
| 722 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | | | | | |
| 723 | Mean (KM) | | | | 0.141 | | | | SD (KM) | | | | | | | |
| 724 | Variance (KM) | | | | 0.0809 | | | | SE of Mean (KM) | | | | | | | |
| 725 | k hat (KM) | | | | 0.244 | | | | k star (KM) | | | | | | | |
| 726 | nu hat (KM) | | | | 22.49 | | | | nu star (KM) | | | | | | | |
| 727 | theta hat (KM) | | | | 0.575 | | | | theta star (KM) | | | | | | | |
| 728 | 80% gamma percentile (KM) | | | | 0.202 | | | | 90% gamma percentile (KM) | | | | | | | |
| 729 | 95% gamma percentile (KM) | | | | 0.687 | | | | 99% gamma percentile (KM) | | | | | | | |
| 730 | | | | | | | | | | | | | | | | |
| 731 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | | | | | |
| 732 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | | | | |
| 733 | | | | | WH | | HW | | | | | | WH | | HW | |
| 734 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.497 | | 0.475 | | 95% Approx. Gamma UPL | | | | 0.388 | | 0.365 | |
| 735 | 95% KM Gamma Percentile | | | | 0.374 | | 0.352 | | 95% Gamma USL | | | | 0.808 | | 0.803 | |
| 736 | | | | | | | | | | | | | | | | |
| 737 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | | | | | |
| 738 | Shapiro Wilk Test Statistic | | | | 0.834 | | | | Shapiro Wilk GOF Test | | | | | | | |
| 739 | 5% Shapiro Wilk Critical Value | | | | 0.887 | | | | Data Not Lognormal at 5% Significance Level | | | | | | | |
| 740 | Lilliefors Test Statistic | | | | 0.255 | | | | Lilliefors GOF Test | | | | | | | |
| 741 | 5% Lilliefors Critical Value | | | | 0.213 | | | | Data Not Lognormal at 5% Significance Level | | | | | | | |
| 742 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | | | | | |
| 743 | | | | | | | | | | | | | | | | |
| 744 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | | | | | |
| 745 | Mean in Original Scale | | | | 0.119 | | | | Mean in Log Scale | | | | | | | |
| 746 | SD in Original Scale | | | | 0.295 | | | | SD in Log Scale | | | | | | | |
| 747 | 95% UTL95% Coverage | | | | 1.053 | | | | 95% BCA UTL95% Coverage | | | | | | | |
| 748 | 95% Bootstrap (%) UTL95% Coverage | | | | 1.443 | | | | 95% UPL (t) | | | | | | | |
| 749 | 90% Percentile (z) | | | | 0.264 | | | | 95% Percentile (z) | | | | | | | |
| 750 | 99% Percentile (z) | | | | 1.616 | | | | 95% USL | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|-----|---|---|---|---|--------|---|---|---|---|---|--------|---|
| 751 | | | | | | | | | | | | |
| 752 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | |
| 753 | KM Mean of Logged Data | | | | -2.535 | | 95% KM UTL (Lognormal)95% Coverage | | | | 0.425 | |
| 754 | KM SD of Logged Data | | | | 0.807 | | 95% KM UPL (Lognormal) | | | | 0.312 | |
| 755 | 95% KM Percentile Lognormal (z) | | | | 0.299 | | 95% KM USL (Lognormal) | | | | 0.84 | |
| 756 | | | | | | | | | | | | |
| 757 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 758 | Mean in Original Scale | | | | 0.128 | | Mean in Log Scale | | | | -2.873 | |
| 759 | SD in Original Scale | | | | 0.292 | | SD in Log Scale | | | | 1.023 | |
| 760 | 95% UTL95% Coverage | | | | 0.474 | | 95% UPL (t) | | | | 0.321 | |
| 761 | 90% Percentile (z) | | | | 0.21 | | 95% Percentile (z) | | | | 0.304 | |
| 762 | 99% Percentile (z) | | | | 0.611 | | 95% USL | | | | 1.126 | |
| 763 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 764 | | | | | | | | | | | | |
| 765 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 766 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 767 | | | | | | | | | | | | |
| 768 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 769 | Order of Statistic, r | | | | 45 | | 95% UTL with95% Coverage | | | | 0.92 | |
| 770 | Approx, f used to compute achieved CC | | | | 1.184 | | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.677 | |
| 771 | Approximate Sample Size needed to achieve specified CC | | | | 93 | | 95% UPL | | | | 0.727 | |
| 772 | 95% USL | | | | 1.8 | | 95% KM Chebyshev UPL | | | | 1.394 | |
| 773 | | | | | | | | | | | | |
| 774 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 775 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 776 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 777 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 778 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 779 | | | | | | | | | | | | |
| 780 | IRON, DISSOLVED | | | | | | | | | | | |
| 781 | | | | | | | | | | | | |
| 782 | General Statistics | | | | | | | | | | | |
| 783 | Total Number of Observations | | | | 12 | | Number of Missing Observations | | | | 34 | |
| 784 | Number of Distinct Observations | | | | 2 | | | | | | | |
| 785 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 12 | |
| 786 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 2 | |
| 787 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 0.05 | |
| 788 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 0.06 | |
| 789 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 790 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 791 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 792 | | | | | | | | | | | | |
| 793 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 794 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 795 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 796 | | | | | | | | | | | | |
| 797 | The data set for variable IRON, DISSOLVED was not processed! | | | | | | | | | | | |
| 798 | | | | | | | | | | | | |
| 799 | | | | | | | | | | | | |
| 800 | MAGNESIUM, TOTAL | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|-----|---|---|---|---|---|-------|---|---|---|---|---|--------|
| 801 | | | | | | | | | | | | |
| 802 | General Statistics | | | | | | | | | | | |
| 803 | Total Number of Observations | | | | | 45 | Number of Distinct Observations | | | | | 24 |
| 804 | | | | | | | Number of Missing Observations | | | | | 1 |
| 805 | Minimum | | | | | 4.6 | First Quartile | | | | | 8.5 |
| 806 | Second Largest | | | | | 10.4 | Median | | | | | 8.9 |
| 807 | Maximum | | | | | 10.6 | Third Quartile | | | | | 9.5 |
| 808 | Mean | | | | | 8.769 | SD | | | | | 1.111 |
| 809 | Coefficient of Variation | | | | | 0.127 | Skewness | | | | | -2.028 |
| 810 | Mean of logged Data | | | | | 2.161 | SD of logged Data | | | | | 0.152 |
| 811 | | | | | | | | | | | | |
| 812 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 813 | Tolerance Factor K (For UTL) | | | | | 2.085 | d2max (for USL) | | | | | 2.915 |
| 814 | | | | | | | | | | | | |
| 815 | Normal GOF Test | | | | | | | | | | | |
| 816 | Shapiro Wilk Test Statistic | | | | | 0.823 | Shapiro Wilk GOF Test | | | | | |
| 817 | 5% Shapiro Wilk Critical Value | | | | | 0.945 | Data Not Normal at 5% Significance Level | | | | | |
| 818 | Lilliefors Test Statistic | | | | | 0.162 | Lilliefors GOF Test | | | | | |
| 819 | 5% Lilliefors Critical Value | | | | | 0.131 | Data Not Normal at 5% Significance Level | | | | | |
| 820 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 821 | | | | | | | | | | | | |
| 822 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 823 | 95% UTL with 95% Coverage | | | | | 11.09 | 90% Percentile (z) | | | | | 10.19 |
| 824 | 95% UPL (t) | | | | | 10.66 | 95% Percentile (z) | | | | | 10.6 |
| 825 | 95% USL | | | | | 12.01 | 99% Percentile (z) | | | | | 11.35 |
| 826 | | | | | | | | | | | | |
| 827 | Gamma GOF Test | | | | | | | | | | | |
| 828 | A-D Test Statistic | | | | | 2.862 | Anderson-Darling Gamma GOF Test | | | | | |
| 829 | 5% A-D Critical Value | | | | | 0.747 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 830 | K-S Test Statistic | | | | | 0.194 | Kolmogorov-Smirnov Gamma GOF Test | | | | | |
| 831 | 5% K-S Critical Value | | | | | 0.131 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 832 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 833 | | | | | | | | | | | | |
| 834 | Gamma Statistics | | | | | | | | | | | |
| 835 | k hat (MLE) | | | | | 50.41 | k star (bias corrected MLE) | | | | | 47.06 |
| 836 | Theta hat (MLE) | | | | | 0.174 | Theta star (bias corrected MLE) | | | | | 0.186 |
| 837 | nu hat (MLE) | | | | | 4537 | nu star (bias corrected) | | | | | 4236 |
| 838 | MLE Mean (bias corrected) | | | | | 8.769 | MLE Sd (bias corrected) | | | | | 1.278 |
| 839 | | | | | | | | | | | | |
| 840 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 841 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | | | 11 | 90% Percentile | | | | | 10.44 |
| 842 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | | 11.05 | 95% Percentile | | | | | 10.97 |
| 843 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | | 11.57 | 99% Percentile | | | | | 12.01 |
| 844 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | | 11.65 | | | | | | |
| 845 | 95% WH USL | | | | | 12.86 | 95% HW USL | | | | | 13.01 |
| 846 | | | | | | | | | | | | |
| 847 | Lognormal GOF Test | | | | | | | | | | | |
| 848 | Shapiro Wilk Test Statistic | | | | | 0.712 | Shapiro Wilk Lognormal GOF Test | | | | | |
| 849 | 5% Shapiro Wilk Critical Value | | | | | 0.945 | Data Not Lognormal at 5% Significance Level | | | | | |
| 850 | Lilliefors Test Statistic | | | | | 0.213 | Lilliefors Lognormal GOF Test | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|-----|--|---|---|-------|---|---|---|---|--------|--------------------|---|-------|
| 851 | 5% Lilliefors Critical Value | | | | 0.131 | Data Not Lognormal at 5% Significance Level | | | | | | |
| 852 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 853 | | | | | | | | | | | | |
| 854 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 855 | 95% UTL with 95% Coverage | | | | 11.93 | | | | | 90% Percentile (z) | | 10.55 |
| 856 | 95% UPL (t) | | | | 11.25 | | | | | 95% Percentile (z) | | 11.15 |
| 857 | 95% USL | | | | 13.53 | | | | | 99% Percentile (z) | | 12.37 |
| 858 | | | | | | | | | | | | |
| 859 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 860 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 861 | | | | | | | | | | | | |
| 862 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 863 | Order of Statistic, r | | | 44 | 95% UTL with 95% Coverage | | | | 10.4 | | | |
| 864 | Approx, f used to compute achieved CC | | | 1.158 | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.665 | | | |
| 865 | | | | | Approximate Sample Size needed to achieve specified CC | | | | 93 | | | |
| 866 | 95% Percentile Bootstrap UTL with 95% Coverage | | | 10.56 | 95% BCA Bootstrap UTL with 95% Coverage | | | | 10.48 | | | |
| 867 | 95% UPL | | | 10.28 | 90% Percentile | | | | 9.7 | | | |
| 868 | 90% Chebyshev UPL | | | 12.14 | 95% Percentile | | | | 9.96 | | | |
| 869 | 95% Chebyshev UPL | | | 13.66 | 99% Percentile | | | | 10.51 | | | |
| 870 | 95% USL | | | 10.6 | | | | | | | | |
| 871 | | | | | | | | | | | | |
| 872 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 873 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 874 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 875 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 876 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 877 | | | | | | | | | | | | |
| 878 | MAGNESIUM, DISSOLVED | | | | | | | | | | | |
| 879 | | | | | | | | | | | | |
| 880 | General Statistics | | | | | | | | | | | |
| 881 | Total Number of Observations | | | 12 | Number of Distinct Observations | | | | 10 | | | |
| 882 | | | | | Number of Missing Observations | | | | 34 | | | |
| 883 | Minimum | | | 7.3 | First Quartile | | | | 8.525 | | | |
| 884 | Second Largest | | | 9.8 | Median | | | | 9.25 | | | |
| 885 | Maximum | | | 10.7 | Third Quartile | | | | 9.6 | | | |
| 886 | Mean | | | 9.033 | SD | | | | 0.992 | | | |
| 887 | Coefficient of Variation | | | 0.11 | Skewness | | | | -0.491 | | | |
| 888 | Mean of logged Data | | | 2.195 | SD of logged Data | | | | 0.114 | | | |
| 889 | | | | | | | | | | | | |
| 890 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 891 | Tolerance Factor K (For UTL) | | | 2.736 | d2max (for USL) | | | | 2.285 | | | |
| 892 | | | | | | | | | | | | |
| 893 | Normal GOF Test | | | | | | | | | | | |
| 894 | Shapiro Wilk Test Statistic | | | 0.935 | Shapiro Wilk GOF Test | | | | | | | |
| 895 | 5% Shapiro Wilk Critical Value | | | 0.859 | Data appear Normal at 5% Significance Level | | | | | | | |
| 896 | Lilliefors Test Statistic | | | 0.153 | Lilliefors GOF Test | | | | | | | |
| 897 | 5% Lilliefors Critical Value | | | 0.243 | Data appear Normal at 5% Significance Level | | | | | | | |
| 898 | Data appear Normal at 5% Significance Level | | | | | | | | | | | |
| 899 | | | | | | | | | | | | |
| 900 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|-----|--|---|---|---|---|-------|---|---|---|---|---|-------|
| 901 | 95% UTL with 95% Coverage | | | | | 11.75 | 90% Percentile (z) | | | | | 10.3 |
| 902 | 95% UPL (t) | | | | | 10.89 | 95% Percentile (z) | | | | | 10.67 |
| 903 | 95% USL | | | | | 11.3 | 99% Percentile (z) | | | | | 11.34 |
| 904 | | | | | | | | | | | | |
| 905 | Gamma GOF Test | | | | | | | | | | | |
| 906 | A-D Test Statistic | | | | | 0.486 | Anderson-Darling Gamma GOF Test | | | | | |
| 907 | 5% A-D Critical Value | | | | | 0.731 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 908 | K-S Test Statistic | | | | | 0.167 | Kolmogorov-Smirnov Gamma GOF Test | | | | | |
| 909 | 5% K-S Critical Value | | | | | 0.245 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 910 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 911 | | | | | | | | | | | | |
| 912 | Gamma Statistics | | | | | | | | | | | |
| 913 | k hat (MLE) | | | | | 86.71 | k star (bias corrected MLE) | | | | | 65.09 |
| 914 | Theta hat (MLE) | | | | | 0.104 | Theta star (bias corrected MLE) | | | | | 0.139 |
| 915 | nu hat (MLE) | | | | | 2081 | nu star (bias corrected) | | | | | 1562 |
| 916 | MLE Mean (bias corrected) | | | | | 9.033 | MLE Sd (bias corrected) | | | | | 1.12 |
| 917 | | | | | | | | | | | | |
| 918 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 919 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | | | 11.02 | 90% Percentile | | | | | 10.49 |
| 920 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | | 11.04 | 95% Percentile | | | | | 10.95 |
| 921 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | | 12.06 | 99% Percentile | | | | | 11.84 |
| 922 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | | 12.1 | | | | | | |
| 923 | 95% WH USL | | | | | 11.51 | 95% HW USL | | | | | 11.54 |
| 924 | | | | | | | | | | | | |
| 925 | Lognormal GOF Test | | | | | | | | | | | |
| 926 | Shapiro Wilk Test Statistic | | | | | 0.916 | Shapiro Wilk Lognormal GOF Test | | | | | |
| 927 | 5% Shapiro Wilk Critical Value | | | | | 0.859 | Data appear Lognormal at 5% Significance Level | | | | | |
| 928 | Lilliefors Test Statistic | | | | | 0.174 | Lilliefors Lognormal GOF Test | | | | | |
| 929 | 5% Lilliefors Critical Value | | | | | 0.243 | Data appear Lognormal at 5% Significance Level | | | | | |
| 930 | Data appear Lognormal at 5% Significance Level | | | | | | | | | | | |
| 931 | | | | | | | | | | | | |
| 932 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 933 | 95% UTL with 95% Coverage | | | | | 12.26 | 90% Percentile (z) | | | | | 10.39 |
| 934 | 95% UPL (t) | | | | | 11.11 | 95% Percentile (z) | | | | | 10.83 |
| 935 | 95% USL | | | | | 11.64 | 99% Percentile (z) | | | | | 11.7 |
| 936 | | | | | | | | | | | | |
| 937 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 938 | Data appear Normal at 5% Significance Level | | | | | | | | | | | |
| 939 | | | | | | | | | | | | |
| 940 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 941 | Order of Statistic, r | | | | | 12 | 95% UTL with 95% Coverage | | | | | 10.7 |
| 942 | Approx, f used to compute achieved CC | | | | | 0.632 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.46 |
| 943 | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | | 59 |
| 944 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | | 10.7 | 95% BCA Bootstrap UTL with 95% Coverage | | | | | 10.7 |
| 945 | 95% UPL | | | | | 10.7 | 90% Percentile | | | | | 9.78 |
| 946 | 90% Chebyshev UPL | | | | | 12.13 | 95% Percentile | | | | | 10.21 |
| 947 | 95% Chebyshev UPL | | | | | 13.53 | 99% Percentile | | | | | 10.6 |
| 948 | 95% USL | | | | | 10.7 | | | | | | |
| 949 | | | | | | | | | | | | |
| 950 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---------|---|---|---|---|---|---|---|
| 951 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 952 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 953 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 954 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 955 | | | | | | | | | | | | |
| 956 | MANGANESE, TOTAL | | | | | | | | | | | |
| 957 | | | | | | | | | | | | |
| 958 | General Statistics | | | | | | | | | | | |
| 959 | Total Number of Observations | | | | 46 | | | | Number of Missing Observations | | | |
| 960 | Number of Distinct Observations | | | | 20 | | | | | | | |
| 961 | Number of Detects | | | | 44 | | | | Number of Non-Detects | | | |
| 962 | Number of Distinct Detects | | | | 18 | | | | Number of Distinct Non-Detects | | | |
| 963 | Minimum Detect | | | | 0.04 | | | | Minimum Non-Detect | | | |
| 964 | Maximum Detect | | | | 0.58 | | | | Maximum Non-Detect | | | |
| 965 | Variance Detected | | | | 0.00771 | | | | Percent Non-Detects | | | |
| 966 | Mean Detected | | | | 0.271 | | | | SD Detected | | | |
| 967 | Mean of Detected Logged Data | | | | -1.367 | | | | SD of Detected Logged Data | | | |
| 968 | | | | | | | | | | | | |
| 969 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 970 | Tolerance Factor K (For UTL) | | | | 2.079 | | | | d2max (for USL) | | | |
| 971 | | | | | | | | | | | | |
| 972 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 973 | Shapiro Wilk Test Statistic | | | | 0.814 | | | | Shapiro Wilk GOF Test | | | |
| 974 | 5% Shapiro Wilk Critical Value | | | | 0.944 | | | | Data Not Normal at 5% Significance Level | | | |
| 975 | Lilliefors Test Statistic | | | | 0.199 | | | | Lilliefors GOF Test | | | |
| 976 | 5% Lilliefors Critical Value | | | | 0.132 | | | | Data Not Normal at 5% Significance Level | | | |
| 977 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 978 | | | | | | | | | | | | |
| 979 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 980 | KM Mean | | | | 0.26 | | | | KM SD | | | |
| 981 | 95% UTL95% Coverage | | | | 0.468 | | | | 95% KM UPL (t) | | | |
| 982 | 90% KM Percentile (z) | | | | 0.388 | | | | 95% KM Percentile (z) | | | |
| 983 | 99% KM Percentile (z) | | | | 0.492 | | | | 95% KM USL | | | |
| 984 | | | | | | | | | | | | |
| 985 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 986 | Mean | | | | 0.261 | | | | SD | | | |
| 987 | 95% UTL95% Coverage | | | | 0.468 | | | | 95% UPL (t) | | | |
| 988 | 90% Percentile (z) | | | | 0.389 | | | | 95% Percentile (z) | | | |
| 989 | 99% Percentile (z) | | | | 0.493 | | | | 95% USL | | | |
| 990 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | |
| 991 | | | | | | | | | | | | |
| 992 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | |
| 993 | A-D Test Statistic | | | | 3.627 | | | | Anderson-Darling GOF Test | | | |
| 994 | 5% A-D Critical Value | | | | 0.75 | | | | Data Not Gamma Distributed at 5% Significance Level | | | |
| 995 | K-S Test Statistic | | | | 0.251 | | | | Kolmogorov-Smirnov GOF | | | |
| 996 | 5% K-S Critical Value | | | | 0.133 | | | | Data Not Gamma Distributed at 5% Significance Level | | | |
| 997 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 998 | | | | | | | | | | | | |
| 999 | Gamma Statistics on Detected Data Only | | | | | | | | | | | |
| 1000 | k hat (MLE) | | | | 8.125 | | | | k star (bias corrected MLE) | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | |
|------|---|---|---|---|---|---------|-------|---|---|---|---|--------|-------|
| 1001 | | | | | Theta hat (MLE) | 0.0334 | | | | | Theta star (bias corrected MLE) | 0.0358 | |
| 1002 | | | | | nu hat (MLE) | 715 | | | | | nu star (bias corrected) | 667.6 | |
| 1003 | | | | | MLE Mean (bias corrected) | 0.271 | | | | | | | |
| 1004 | | | | | MLE Sd (bias corrected) | 0.0985 | | | | | 95% Percentile of Chisquare (2kstar) | 25.22 | |
| 1005 | | | | | | | | | | | | | |
| 1006 | | | | | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | |
| 1007 | | | | | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | |
| 1008 | | | | | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | |
| 1009 | | | | | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | |
| 1010 | | | | | This is especially true when the sample size is small. | | | | | | | | |
| 1011 | | | | | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | |
| 1012 | | | | | Minimum | 0.04 | | | | | Mean | 0.265 | |
| 1013 | | | | | Maximum | 0.58 | | | | | Median | 0.26 | |
| 1014 | | | | | SD | 0.0909 | | | | | CV | 0.343 | |
| 1015 | | | | | k hat (MLE) | 7.321 | | | | | k star (bias corrected MLE) | 6.858 | |
| 1016 | | | | | Theta hat (MLE) | 0.0362 | | | | | Theta star (bias corrected MLE) | 0.0386 | |
| 1017 | | | | | nu hat (MLE) | 673.6 | | | | | nu star (bias corrected) | 631 | |
| 1018 | | | | | MLE Mean (bias corrected) | 0.265 | | | | | MLE Sd (bias corrected) | 0.101 | |
| 1019 | | | | | 95% Percentile of Chisquare (2kstar) | 23.31 | | | | | 90% Percentile | 0.4 | |
| 1020 | | | | | 95% Percentile | 0.45 | | | | | 99% Percentile | 0.555 | |
| 1021 | | | | | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | |
| 1022 | | | | | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | |
| 1023 | | | | | | WH | HW | | | | WH | HW | |
| 1024 | | | | | 95% Approx. Gamma UTL with 95% Coverage | 0.509 | 0.523 | | | | 95% Approx. Gamma UPL | 0.453 | 0.462 |
| 1025 | | | | | 95% Gamma USL | 0.648 | 0.68 | | | | | | |
| 1026 | | | | | | | | | | | | | |
| 1027 | | | | | Estimates of Gamma Parameters using KM Estimates | | | | | | | | |
| 1028 | | | | | Mean (KM) | 0.26 | | | | | SD (KM) | 0.0998 | |
| 1029 | | | | | Variance (KM) | 0.00997 | | | | | SE of Mean (KM) | 0.0149 | |
| 1030 | | | | | k hat (KM) | 6.792 | | | | | k star (KM) | 6.364 | |
| 1031 | | | | | nu hat (KM) | 624.9 | | | | | nu star (KM) | 585.4 | |
| 1032 | | | | | theta hat (KM) | 0.0383 | | | | | theta star (KM) | 0.0409 | |
| 1033 | | | | | 80% gamma percentile (KM) | 0.341 | | | | | 90% gamma percentile (KM) | 0.398 | |
| 1034 | | | | | 95% gamma percentile (KM) | 0.45 | | | | | 99% gamma percentile (KM) | 0.558 | |
| 1035 | | | | | | | | | | | | | |
| 1036 | | | | | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | |
| 1037 | | | | | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | |
| 1038 | | | | | | WH | HW | | | | WH | HW | |
| 1039 | | | | | 95% Approx. Gamma UTL with 95% Coverage | 0.63 | 0.693 | | | | 95% Approx. Gamma UPL | 0.539 | 0.58 |
| 1040 | | | | | 95% KM Gamma Percentile | 0.528 | 0.566 | | | | 95% Gamma USL | 0.867 | 1 |
| 1041 | | | | | | | | | | | | | |
| 1042 | | | | | Lognormal GOF Test on Detected Observations Only | | | | | | | | |
| 1043 | | | | | Shapiro Wilk Test Statistic | 0.732 | | | | | Shapiro Wilk GOF Test | | |
| 1044 | | | | | 5% Shapiro Wilk Critical Value | 0.944 | | | | | Data Not Lognormal at 5% Significance Level | | |
| 1045 | | | | | Lilliefors Test Statistic | 0.276 | | | | | Lilliefors GOF Test | | |
| 1046 | | | | | 5% Lilliefors Critical Value | 0.132 | | | | | Data Not Lognormal at 5% Significance Level | | |
| 1047 | | | | | Data Not Lognormal at 5% Significance Level | | | | | | | | |
| 1048 | | | | | | | | | | | | | |
| 1049 | | | | | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | |
| 1050 | | | | | Mean in Original Scale | 0.265 | | | | | Mean in Log Scale | -1.401 | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|--|---|--------|---|---|---|---|-----------------|--------|
| 1051 | | | | SD in Original Scale | | 0.0915 | | | | | SD in Log Scale | 0.425 |
| 1052 | | | | 95% UTL95% Coverage | | 0.597 | | | | 95% BCA UTL95% Coverage | | 0.55 |
| 1053 | | | | 95% Bootstrap (%) UTL95% Coverage | | 0.573 | | | | 95% UPL (t) | | 0.507 |
| 1054 | | | | 90% Percentile (z) | | 0.425 | | | | 95% Percentile (z) | | 0.496 |
| 1055 | | | | 99% Percentile (z) | | 0.663 | | | | 95% USL | | 0.855 |
| 1056 | | | | | | | | | | | | |
| 1057 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | |
| 1058 | | | | KM Mean of Logged Data | | -1.512 | | | | 95% KM UTL (Lognormal)95% Coverage | | 1.17 |
| 1059 | | | | KM SD of Logged Data | | 0.802 | | | | 95% KM UPL (Lognormal) | | 0.861 |
| 1060 | | | | 95% KM Percentile Lognormal (z) | | 0.825 | | | | 95% KM USL (Lognormal) | | 2.304 |
| 1061 | | | | | | | | | | | | |
| 1062 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 1063 | | | | Mean in Original Scale | | 0.261 | | | | Mean in Log Scale | | -1.501 |
| 1064 | | | | SD in Original Scale | | 0.0997 | | | | SD in Log Scale | | 0.805 |
| 1065 | | | | 95% UTL95% Coverage | | 1.19 | | | | 95% UPL (t) | | 0.875 |
| 1066 | | | | 90% Percentile (z) | | 0.626 | | | | 95% Percentile (z) | | 0.839 |
| 1067 | | | | 99% Percentile (z) | | 1.452 | | | | 95% USL | | 2.35 |
| 1068 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 1069 | | | | | | | | | | | | |
| 1070 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 1071 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 1072 | | | | | | | | | | | | |
| 1073 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 1074 | | | | Order of Statistic, r | | 45 | | | | 95% UTL with95% Coverage | | 0.55 |
| 1075 | | | | Approx, f used to compute achieved CC | | 1.184 | | | | Approximate Actual Confidence Coefficient achieved by UTL | | 0.677 |
| 1076 | | | | Approximate Sample Size needed to achieve specified CC | | 93 | | | | 95% UPL | | 0.477 |
| 1077 | | | | 95% USL | | 0.58 | | | | 95% KM Chebyshev UPL | | 0.7 |
| 1078 | | | | | | | | | | | | |
| 1079 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 1080 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 1081 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 1082 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 1083 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 1084 | | | | | | | | | | | | |
| 1085 | MANGANESE, DISSOLVED | | | | | | | | | | | |
| 1086 | | | | | | | | | | | | |
| 1087 | General Statistics | | | | | | | | | | | |
| 1088 | | | | Total Number of Observations | | 12 | | | | Number of Distinct Observations | | 9 |
| 1089 | | | | | | | | | | Number of Missing Observations | | 34 |
| 1090 | | | | Minimum | | 0.11 | | | | First Quartile | | 0.238 |
| 1091 | | | | Second Largest | | 0.32 | | | | Median | | 0.255 |
| 1092 | | | | Maximum | | 0.57 | | | | Third Quartile | | 0.31 |
| 1093 | | | | Mean | | 0.281 | | | | SD | | 0.108 |
| 1094 | | | | Coefficient of Variation | | 0.385 | | | | Skewness | | 1.616 |
| 1095 | | | | Mean of logged Data | | -1.333 | | | | SD of logged Data | | 0.377 |
| 1096 | | | | | | | | | | | | |
| 1097 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 1098 | | | | Tolerance Factor K (For UTL) | | 2.736 | | | | d2max (for USL) | | 2.285 |
| 1099 | | | | | | | | | | | | |
| 1100 | Normal GOF Test | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|--------|---|---|---|---|---|-------|
| 1101 | Shapiro Wilk Test Statistic | | | | | 0.818 | Shapiro Wilk GOF Test | | | | | |
| 1102 | 5% Shapiro Wilk Critical Value | | | | | 0.859 | Data Not Normal at 5% Significance Level | | | | | |
| 1103 | Lilliefors Test Statistic | | | | | 0.275 | Lilliefors GOF Test | | | | | |
| 1104 | 5% Lilliefors Critical Value | | | | | 0.243 | Data Not Normal at 5% Significance Level | | | | | |
| 1105 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 1106 | | | | | | | | | | | | |
| 1107 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 1108 | 95% UTL with 95% Coverage | | | | | 0.577 | 90% Percentile (z) | | | | | 0.419 |
| 1109 | 95% UPL (t) | | | | | 0.483 | 95% Percentile (z) | | | | | 0.459 |
| 1110 | 95% USL | | | | | 0.528 | 99% Percentile (z) | | | | | 0.532 |
| 1111 | | | | | | | | | | | | |
| 1112 | Gamma GOF Test | | | | | | | | | | | |
| 1113 | A-D Test Statistic | | | | | 0.71 | Anderson-Darling Gamma GOF Test | | | | | |
| 1114 | 5% A-D Critical Value | | | | | 0.731 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 1115 | K-S Test Statistic | | | | | 0.227 | Kolmogorov-Smirnov Gamma GOF Test | | | | | |
| 1116 | 5% K-S Critical Value | | | | | 0.246 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 1117 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 1118 | | | | | | | | | | | | |
| 1119 | Gamma Statistics | | | | | | | | | | | |
| 1120 | k hat (MLE) | | | | | 8.062 | k star (bias corrected MLE) | | | | | 6.102 |
| 1121 | Theta hat (MLE) | | | | | 0.0348 | Theta star (bias corrected MLE) | | | | | 0.046 |
| 1122 | nu hat (MLE) | | | | | 193.5 | nu star (bias corrected) | | | | | 146.5 |
| 1123 | MLE Mean (bias corrected) | | | | | 0.281 | MLE Sd (bias corrected) | | | | | 0.114 |
| 1124 | | | | | | | | | | | | |
| 1125 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 1126 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | | | 0.503 | 90% Percentile | | | | | 0.433 |
| 1127 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | | 0.509 | 95% Percentile | | | | | 0.49 |
| 1128 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | | 0.647 | 99% Percentile | | | | | 0.61 |
| 1129 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | | 0.664 | | | | | | |
| 1130 | 95% WH USL | | | | | 0.569 | 95% HW USL | | | | | 0.58 |
| 1131 | | | | | | | | | | | | |
| 1132 | Lognormal GOF Test | | | | | | | | | | | |
| 1133 | Shapiro Wilk Test Statistic | | | | | 0.881 | Shapiro Wilk Lognormal GOF Test | | | | | |
| 1134 | 5% Shapiro Wilk Critical Value | | | | | 0.859 | Data appear Lognormal at 5% Significance Level | | | | | |
| 1135 | Lilliefors Test Statistic | | | | | 0.22 | Lilliefors Lognormal GOF Test | | | | | |
| 1136 | 5% Lilliefors Critical Value | | | | | 0.243 | Data appear Lognormal at 5% Significance Level | | | | | |
| 1137 | Data appear Lognormal at 5% Significance Level | | | | | | | | | | | |
| 1138 | | | | | | | | | | | | |
| 1139 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 1140 | 95% UTL with 95% Coverage | | | | | 0.739 | 90% Percentile (z) | | | | | 0.427 |
| 1141 | 95% UPL (t) | | | | | 0.533 | 95% Percentile (z) | | | | | 0.49 |
| 1142 | 95% USL | | | | | 0.623 | 99% Percentile (z) | | | | | 0.633 |
| 1143 | | | | | | | | | | | | |
| 1144 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 1145 | Data appear Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 1146 | | | | | | | | | | | | |
| 1147 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 1148 | Order of Statistic, r | | | | | 12 | 95% UTL with 95% Coverage | | | | | 0.57 |
| 1149 | Approx, f used to compute achieved CC | | | | | 0.632 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.46 |
| 1150 | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | | 59 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|---|-------|---|---|---|---|---|--------|
| 1151 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | | 0.57 | 95% BCA Bootstrap UTL with 95% Coverage | | | | | 0.57 |
| 1152 | 95% UPL | | | | | 0.57 | 90% Percentile | | | | | 0.319 |
| 1153 | 90% Chebyshev UPL | | | | | 0.618 | 95% Percentile | | | | | 0.433 |
| 1154 | 95% Chebyshev UPL | | | | | 0.771 | 99% Percentile | | | | | 0.543 |
| 1155 | 95% USL | | | | | 0.57 | | | | | | |
| 1156 | | | | | | | | | | | | |
| 1157 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 1158 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 1159 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 1160 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 1161 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 1162 | | | | | | | | | | | | |
| 1163 | NITRATE-NITROGEN | | | | | | | | | | | |
| 1164 | | | | | | | | | | | | |
| 1165 | General Statistics | | | | | | | | | | | |
| 1166 | Total Number of Observations | | | | | 45 | Number of Distinct Observations | | | | | 37 |
| 1167 | | | | | | | Number of Missing Observations | | | | | 1 |
| 1168 | Minimum | | | | | 4.9 | First Quartile | | | | | 19.8 |
| 1169 | Second Largest | | | | | 29 | Median | | | | | 22.5 |
| 1170 | Maximum | | | | | 31.7 | Third Quartile | | | | | 25.9 |
| 1171 | Mean | | | | | 21.07 | SD | | | | | 6.332 |
| 1172 | Coefficient of Variation | | | | | 0.301 | Skewness | | | | | -1.001 |
| 1173 | Mean of logged Data | | | | | 2.982 | SD of logged Data | | | | | 0.411 |
| 1174 | | | | | | | | | | | | |
| 1175 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 1176 | Tolerance Factor K (For UTL) | | | | | 2.085 | d2max (for USL) | | | | | 2.915 |
| 1177 | | | | | | | | | | | | |
| 1178 | Normal GOF Test | | | | | | | | | | | |
| 1179 | Shapiro Wilk Test Statistic | | | | | 0.896 | Shapiro Wilk GOF Test | | | | | |
| 1180 | 5% Shapiro Wilk Critical Value | | | | | 0.945 | Data Not Normal at 5% Significance Level | | | | | |
| 1181 | Lilliefors Test Statistic | | | | | 0.176 | Lilliefors GOF Test | | | | | |
| 1182 | 5% Lilliefors Critical Value | | | | | 0.131 | Data Not Normal at 5% Significance Level | | | | | |
| 1183 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 1184 | | | | | | | | | | | | |
| 1185 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 1186 | 95% UTL with 95% Coverage | | | | | 34.27 | 90% Percentile (z) | | | | | 29.18 |
| 1187 | 95% UPL (t) | | | | | 31.83 | 95% Percentile (z) | | | | | 31.48 |
| 1188 | 95% USL | | | | | 39.53 | 99% Percentile (z) | | | | | 35.8 |
| 1189 | | | | | | | | | | | | |
| 1190 | Gamma GOF Test | | | | | | | | | | | |
| 1191 | A-D Test Statistic | | | | | 2.982 | Anderson-Darling Gamma GOF Test | | | | | |
| 1192 | 5% A-D Critical Value | | | | | 0.751 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1193 | K-S Test Statistic | | | | | 0.235 | Kolmogorov-Smirnov Gamma GOF Test | | | | | |
| 1194 | 5% K-S Critical Value | | | | | 0.132 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1195 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 1196 | | | | | | | | | | | | |
| 1197 | Gamma Statistics | | | | | | | | | | | |
| 1198 | k hat (MLE) | | | | | 7.766 | k star (bias corrected MLE) | | | | | 7.263 |
| 1199 | Theta hat (MLE) | | | | | 2.713 | Theta star (bias corrected MLE) | | | | | 2.901 |
| 1200 | nu hat (MLE) | | | | | 698.9 | nu star (bias corrected) | | | | | 653.7 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|---|-------|---|---|---|---|---|-------|
| 1201 | MLE Mean (bias corrected) | | | | | 21.07 | MLE Sd (bias corrected) | | | | | 7.818 |
| 1202 | | | | | | | | | | | | |
| 1203 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 1204 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | | | 35.62 | 90% Percentile | | | | | 31.5 |
| 1205 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | | 36.42 | 95% Percentile | | | | | 35.36 |
| 1206 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | | 39.96 | 99% Percentile | | | | | 43.37 |
| 1207 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | | 41.2 | | | | | | |
| 1208 | 95% WH USL | | | | | 50.46 | 95% HW USL | | | | | 53.08 |
| 1209 | | | | | | | | | | | | |
| 1210 | Lognormal GOF Test | | | | | | | | | | | |
| 1211 | Shapiro Wilk Test Statistic | | | | | 0.782 | Shapiro Wilk Lognormal GOF Test | | | | | |
| 1212 | 5% Shapiro Wilk Critical Value | | | | | 0.945 | Data Not Lognormal at 5% Significance Level | | | | | |
| 1213 | Lilliefors Test Statistic | | | | | 0.259 | Lilliefors Lognormal GOF Test | | | | | |
| 1214 | 5% Lilliefors Critical Value | | | | | 0.131 | Data Not Lognormal at 5% Significance Level | | | | | |
| 1215 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 1216 | | | | | | | | | | | | |
| 1217 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 1218 | 95% UTL with 95% Coverage | | | | | 46.46 | 90% Percentile (z) | | | | | 33.4 |
| 1219 | 95% UPL (t) | | | | | 39.64 | 95% Percentile (z) | | | | | 38.77 |
| 1220 | 95% USL | | | | | 65.34 | 99% Percentile (z) | | | | | 51.3 |
| 1221 | | | | | | | | | | | | |
| 1222 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 1223 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 1224 | | | | | | | | | | | | |
| 1225 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 1226 | Order of Statistic, r | | | | | 44 | 95% UTL with 95% Coverage | | | | | 29 |
| 1227 | Approx, f used to compute achieved CC | | | | | 1.158 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.665 |
| 1228 | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | | 93 |
| 1229 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | | 31.16 | 95% BCA Bootstrap UTL with 95% Coverage | | | | | 30.78 |
| 1230 | 95% UPL | | | | | 28.64 | 90% Percentile | | | | | 26.7 |
| 1231 | 90% Chebyshev UPL | | | | | 40.27 | 95% Percentile | | | | | 27.66 |
| 1232 | 95% Chebyshev UPL | | | | | 48.97 | 99% Percentile | | | | | 30.51 |
| 1233 | 95% USL | | | | | 31.7 | | | | | | |
| 1234 | | | | | | | | | | | | |
| 1235 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 1236 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 1237 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 1238 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 1239 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 1240 | | | | | | | | | | | | |
| 1241 | pH-FIELD | | | | | | | | | | | |
| 1242 | | | | | | | | | | | | |
| 1243 | General Statistics | | | | | | | | | | | |
| 1244 | Total Number of Observations | | | | | 45 | Number of Distinct Observations | | | | | 38 |
| 1245 | | | | | | | Number of Missing Observations | | | | | 1 |
| 1246 | Minimum | | | | | 3.91 | First Quartile | | | | | 4.55 |
| 1247 | Second Largest | | | | | 6.55 | Median | | | | | 4.66 |
| 1248 | Maximum | | | | | 7.44 | Third Quartile | | | | | 5.15 |
| 1249 | Mean | | | | | 4.975 | SD | | | | | 0.671 |
| 1250 | Coefficient of Variation | | | | | 0.135 | Skewness | | | | | 1.691 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|--------|---|--|-------------------|---|---|--------|-------|-------|
| 1251 | Mean of logged Data | | | | | 1.597 | SD of logged Data | | | | | 0.124 |
| 1252 | | | | | | | | | | | | |
| 1253 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 1254 | Tolerance Factor K (For UTL) | | | | 2.085 | d2max (for USL) | | | | | 2.915 | |
| 1255 | | | | | | | | | | | | |
| 1256 | Normal GOF Test | | | | | | | | | | | |
| 1257 | Shapiro Wilk Test Statistic | | | | 0.836 | Shapiro Wilk GOF Test | | | | | | |
| 1258 | 5% Shapiro Wilk Critical Value | | | | 0.945 | Data Not Normal at 5% Significance Level | | | | | | |
| 1259 | Lilliefors Test Statistic | | | | 0.192 | Lilliefors GOF Test | | | | | | |
| 1260 | 5% Lilliefors Critical Value | | | | 0.131 | Data Not Normal at 5% Significance Level | | | | | | |
| 1261 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 1262 | | | | | | | | | | | | |
| 1263 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 1264 | 95% UTL with 95% Coverage | | | 6.374 | 90% Percentile (z) | | | | | 5.835 | | |
| 1265 | 95% UPL (t) | | | 6.115 | 95% Percentile (z) | | | | | 6.079 | | |
| 1266 | 95% USL | | | 6.931 | 99% Percentile (z) | | | | | 6.536 | | |
| 1267 | | | | | | | | | | | | |
| 1268 | Gamma GOF Test | | | | | | | | | | | |
| 1269 | A-D Test Statistic | | | 2.301 | Anderson-Darling Gamma GOF Test | | | | | | | |
| 1270 | 5% A-D Critical Value | | | 0.747 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | |
| 1271 | K-S Test Statistic | | | 0.193 | Kolmogorov-Smirnov Gamma GOF Test | | | | | | | |
| 1272 | 5% K-S Critical Value | | | 0.131 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | |
| 1273 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 1274 | | | | | | | | | | | | |
| 1275 | Gamma Statistics | | | | | | | | | | | |
| 1276 | k hat (MLE) | | | 63.05 | k star (bias corrected MLE) | | | | | 58.86 | | |
| 1277 | Theta hat (MLE) | | | 0.0789 | Theta star (bias corrected MLE) | | | | | 0.0845 | | |
| 1278 | nu hat (MLE) | | | 5674 | nu star (bias corrected) | | | | | 5298 | | |
| 1279 | MLE Mean (bias corrected) | | | 4.975 | MLE Sd (bias corrected) | | | | | 0.648 | | |
| 1280 | | | | | | | | | | | | |
| 1281 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 1282 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | 6.1 | 90% Percentile | | | | | 5.822 | | |
| 1283 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | 6.099 | 95% Percentile | | | | | 6.088 | | |
| 1284 | 95% WH Approx. Gamma UTL with 95% Coverage | | | 6.385 | 99% Percentile | | | | | 6.607 | | |
| 1285 | 95% HW Approx. Gamma UTL with 95% Coverage | | | 6.387 | | | | | | | | |
| 1286 | 95% WH USL | | | 7.026 | 95% HW USL | | | | | 7.041 | | |
| 1287 | | | | | | | | | | | | |
| 1288 | Lognormal GOF Test | | | | | | | | | | | |
| 1289 | Shapiro Wilk Test Statistic | | | 0.88 | Shapiro Wilk Lognormal GOF Test | | | | | | | |
| 1290 | 5% Shapiro Wilk Critical Value | | | 0.945 | Data Not Lognormal at 5% Significance Level | | | | | | | |
| 1291 | Lilliefors Test Statistic | | | 0.189 | Lilliefors Lognormal GOF Test | | | | | | | |
| 1292 | 5% Lilliefors Critical Value | | | 0.131 | Data Not Lognormal at 5% Significance Level | | | | | | | |
| 1293 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 1294 | | | | | | | | | | | | |
| 1295 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 1296 | 95% UTL with 95% Coverage | | | 6.396 | 90% Percentile (z) | | | | | 5.788 | | |
| 1297 | 95% UPL (t) | | | 6.096 | 95% Percentile (z) | | | | | 6.055 | | |
| 1298 | 95% USL | | | 7.091 | 99% Percentile (z) | | | | | 6.591 | | |
| 1299 | | | | | | | | | | | | |
| 1300 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|--|---|---|---|----|---|-------|---|
| 1301 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 1302 | | | | | | | | | | | | |
| 1303 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 1304 | Order of Statistic, r | | | | 44 | | 95% UTL with 95% Coverage | | | | 6.55 | |
| 1305 | Approx, f used to compute achieved CC | | | | 1.158 | | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.665 | |
| 1306 | | | | | Approximate Sample Size needed to achieve specified CC | | | | 93 | | | |
| 1307 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | 7.262 | | 95% BCA Bootstrap UTL with 95% Coverage | | | | 7.228 | |
| 1308 | 95% UPL | | | | 6.499 | | 90% Percentile | | | | 5.802 | |
| 1309 | 90% Chebyshev UPL | | | | 7.01 | | 95% Percentile | | | | 6.294 | |
| 1310 | 95% Chebyshev UPL | | | | 7.931 | | 99% Percentile | | | | 7.048 | |
| 1311 | 95% USL | | | | 7.44 | | | | | | | |
| 1312 | | | | | | | | | | | | |
| 1313 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 1314 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 1315 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 1316 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 1317 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 1318 | | | | | | | | | | | | |
| 1319 | pH-LAB | | | | | | | | | | | |
| 1320 | | | | | | | | | | | | |
| 1321 | General Statistics | | | | | | | | | | | |
| 1322 | Total Number of Observations | | | | 45 | | Number of Distinct Observations | | | | 40 | |
| 1323 | | | | | Number of Missing Observations | | | | 1 | | | |
| 1324 | Minimum | | | | 4.81 | | First Quartile | | | | 5.39 | |
| 1325 | Second Largest | | | | 9.33 | | Median | | | | 5.57 | |
| 1326 | Maximum | | | | 9.42 | | Third Quartile | | | | 5.77 | |
| 1327 | Mean | | | | 5.829 | | SD | | | | 0.975 | |
| 1328 | Coefficient of Variation | | | | 0.167 | | Skewness | | | | 2.489 | |
| 1329 | Mean of logged Data | | | | 1.752 | | SD of logged Data | | | | 0.144 | |
| 1330 | | | | | | | | | | | | |
| 1331 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 1332 | Tolerance Factor K (For UTL) | | | | 2.085 | | d2max (for USL) | | | | 2.915 | |
| 1333 | | | | | | | | | | | | |
| 1334 | Normal GOF Test | | | | | | | | | | | |
| 1335 | Shapiro Wilk Test Statistic | | | | 0.697 | | Shapiro Wilk GOF Test | | | | | |
| 1336 | 5% Shapiro Wilk Critical Value | | | | 0.945 | | Data Not Normal at 5% Significance Level | | | | | |
| 1337 | Lilliefors Test Statistic | | | | 0.292 | | Lilliefors GOF Test | | | | | |
| 1338 | 5% Lilliefors Critical Value | | | | 0.131 | | Data Not Normal at 5% Significance Level | | | | | |
| 1339 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 1340 | | | | | | | | | | | | |
| 1341 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 1342 | 95% UTL with 95% Coverage | | | | 7.863 | | 90% Percentile (z) | | | | 7.079 | |
| 1343 | 95% UPL (t) | | | | 7.486 | | 95% Percentile (z) | | | | 7.434 | |
| 1344 | 95% USL | | | | 8.673 | | 99% Percentile (z) | | | | 8.098 | |
| 1345 | | | | | | | | | | | | |
| 1346 | Gamma GOF Test | | | | | | | | | | | |
| 1347 | A-D Test Statistic | | | | 4.036 | | Anderson-Darling Gamma GOF Test | | | | | |
| 1348 | 5% A-D Critical Value | | | | 0.747 | | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1349 | K-S Test Statistic | | | | 0.271 | | Kolmogorov-Smirnov Gamma GOF Test | | | | | |
| 1350 | 5% K-S Critical Value | | | | 0.131 | | Data Not Gamma Distributed at 5% Significance Level | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|-------|---|---|---|---|---|-------|---|
| 1351 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 1352 | | | | | | | | | | | | |
| 1353 | Gamma Statistics | | | | | | | | | | | |
| 1354 | k hat (MLE) | | | | 44.81 | | k star (bias corrected MLE) | | | | 41.84 | |
| 1355 | Theta hat (MLE) | | | | 0.13 | | Theta star (bias corrected MLE) | | | | 0.139 | |
| 1356 | nu hat (MLE) | | | | 4033 | | nu star (bias corrected) | | | | 3766 | |
| 1357 | MLE Mean (bias corrected) | | | | 5.829 | | MLE Sd (bias corrected) | | | | 0.901 | |
| 1358 | | | | | | | | | | | | |
| 1359 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 1360 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | | 7.403 | | 90% Percentile | | | | 7.01 | |
| 1361 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | 7.393 | | 95% Percentile | | | | 7.387 | |
| 1362 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | 7.809 | | 99% Percentile | | | | 8.128 | |
| 1363 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | 7.803 | | | | | | | |
| 1364 | 95% WH USL | | | | 8.731 | | 95% HW USL | | | | 8.741 | |
| 1365 | | | | | | | | | | | | |
| 1366 | Lognormal GOF Test | | | | | | | | | | | |
| 1367 | Shapiro Wilk Test Statistic | | | | 0.771 | | Shapiro Wilk Lognormal GOF Test | | | | | |
| 1368 | 5% Shapiro Wilk Critical Value | | | | 0.945 | | Data Not Lognormal at 5% Significance Level | | | | | |
| 1369 | Lilliefors Test Statistic | | | | 0.259 | | Lilliefors Lognormal GOF Test | | | | | |
| 1370 | 5% Lilliefors Critical Value | | | | 0.131 | | Data Not Lognormal at 5% Significance Level | | | | | |
| 1371 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 1372 | | | | | | | | | | | | |
| 1373 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 1374 | 95% UTL with 95% Coverage | | | | 7.788 | | 90% Percentile (z) | | | | 6.935 | |
| 1375 | 95% UPL (t) | | | | 7.366 | | 95% Percentile (z) | | | | 7.309 | |
| 1376 | 95% USL | | | | 8.78 | | 99% Percentile (z) | | | | 8.064 | |
| 1377 | | | | | | | | | | | | |
| 1378 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 1379 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 1380 | | | | | | | | | | | | |
| 1381 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 1382 | Order of Statistic, r | | | | 44 | | 95% UTL with 95% Coverage | | | | 9.33 | |
| 1383 | Approx, f used to compute achieved CC | | | | 1.158 | | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.665 | |
| 1384 | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | 93 | |
| 1385 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | 9.402 | | 95% BCA Bootstrap UTL with 95% Coverage | | | | 9.33 | |
| 1386 | 95% UPL | | | | 8.874 | | 90% Percentile | | | | 6.906 | |
| 1387 | 90% Chebyshev UPL | | | | 8.788 | | 95% Percentile | | | | 7.696 | |
| 1388 | 95% Chebyshev UPL | | | | 10.13 | | 99% Percentile | | | | 9.38 | |
| 1389 | 95% USL | | | | 9.42 | | | | | | | |
| 1390 | | | | | | | | | | | | |
| 1391 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 1392 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 1393 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 1394 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 1395 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 1396 | | | | | | | | | | | | |
| 1397 | POTASSIUM, TOTAL | | | | | | | | | | | |
| 1398 | | | | | | | | | | | | |
| 1399 | General Statistics | | | | | | | | | | | |
| 1400 | Total Number of Observations | | | | 44 | | Number of Distinct Observations | | | | 17 | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|--|-------|---|---|---|---|---|-------|
| 1401 | | | | | | | | | | | Number of Missing Observations | 2 |
| 1402 | | | | | Minimum | 0.95 | | | | | First Quartile | 1.2 |
| 1403 | | | | | Second Largest | 14.4 | | | | | Median | 1.3 |
| 1404 | | | | | Maximum | 132 | | | | | Third Quartile | 1.9 |
| 1405 | | | | | Mean | 5.156 | | | | | SD | 19.74 |
| 1406 | | | | | Coefficient of Variation | 3.83 | | | | | Skewness | 6.456 |
| 1407 | | | | | Mean of logged Data | 0.594 | | | | | SD of logged Data | 0.908 |
| 1408 | | | | | | | | | | | | |
| 1409 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 1410 | | | | | Tolerance Factor K (For UTL) | 2.091 | | | | | d2max (for USL) | 2.906 |
| 1411 | | | | | | | | | | | | |
| 1412 | Normal GOF Test | | | | | | | | | | | |
| 1413 | | | | | Shapiro Wilk Test Statistic | 0.216 | | | | | Shapiro Wilk GOF Test | |
| 1414 | | | | | 5% Shapiro Wilk Critical Value | 0.944 | | | | | Data Not Normal at 5% Significance Level | |
| 1415 | | | | | Lilliefors Test Statistic | 0.428 | | | | | Lilliefors GOF Test | |
| 1416 | | | | | 5% Lilliefors Critical Value | 0.132 | | | | | Data Not Normal at 5% Significance Level | |
| 1417 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 1418 | | | | | | | | | | | | |
| 1419 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 1420 | | | | | 95% UTL with 95% Coverage | 46.44 | | | | | 90% Percentile (z) | 30.46 |
| 1421 | | | | | 95% UPL (t) | 38.72 | | | | | 95% Percentile (z) | 37.63 |
| 1422 | | | | | 95% USL | 62.54 | | | | | 99% Percentile (z) | 51.09 |
| 1423 | | | | | | | | | | | | |
| 1424 | Gamma GOF Test | | | | | | | | | | | |
| 1425 | | | | | A-D Test Statistic | 9.788 | | | | | Anderson-Darling Gamma GOF Test | |
| 1426 | | | | | 5% A-D Critical Value | 0.805 | | | | | Data Not Gamma Distributed at 5% Significance Level | |
| 1427 | | | | | K-S Test Statistic | 0.375 | | | | | Kolmogorov-Smirnov Gamma GOF Test | |
| 1428 | | | | | 5% K-S Critical Value | 0.14 | | | | | Data Not Gamma Distributed at 5% Significance Level | |
| 1429 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 1430 | | | | | | | | | | | | |
| 1431 | Gamma Statistics | | | | | | | | | | | |
| 1432 | | | | | k hat (MLE) | 0.592 | | | | | k star (bias corrected MLE) | 0.567 |
| 1433 | | | | | Theta hat (MLE) | 8.711 | | | | | Theta star (bias corrected MLE) | 9.098 |
| 1434 | | | | | nu hat (MLE) | 52.09 | | | | | nu star (bias corrected) | 49.87 |
| 1435 | | | | | MLE Mean (bias corrected) | 5.156 | | | | | MLE Sd (bias corrected) | 6.849 |
| 1436 | | | | | | | | | | | | |
| 1437 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 1438 | | | | | 95% Wilson Hilferty (WH) Approx. Gamma UPL | 14.3 | | | | | 90% Percentile | 13.58 |
| 1439 | | | | | 95% Hawkins Wixley (HW) Approx. Gamma UPL | 12.38 | | | | | 95% Percentile | 18.94 |
| 1440 | | | | | 95% WH Approx. Gamma UTL with 95% Coverage | 19.4 | | | | | 99% Percentile | 31.96 |
| 1441 | | | | | 95% HW Approx. Gamma UTL with 95% Coverage | 17.04 | | | | | | |
| 1442 | | | | | 95% WH USL | 33.66 | | | | | 95% HW USL | 30.85 |
| 1443 | | | | | | | | | | | | |
| 1444 | Lognormal GOF Test | | | | | | | | | | | |
| 1445 | | | | | Shapiro Wilk Test Statistic | 0.625 | | | | | Shapiro Wilk Lognormal GOF Test | |
| 1446 | | | | | 5% Shapiro Wilk Critical Value | 0.944 | | | | | Data Not Lognormal at 5% Significance Level | |
| 1447 | | | | | Lilliefors Test Statistic | 0.274 | | | | | Lilliefors Lognormal GOF Test | |
| 1448 | | | | | 5% Lilliefors Critical Value | 0.132 | | | | | Data Not Lognormal at 5% Significance Level | |
| 1449 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 1450 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | |
|------|--|---|---|---|-------|---|---|---|---|---|--------------------|---|-------|
| 1451 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | | |
| 1452 | 95% UTL with 95% Coverage | | | | 12.1 | | | | | | 90% Percentile (z) | | 5.802 |
| 1453 | 95% UPL (t) | | | | 8.486 | | | | | | 95% Percentile (z) | | 8.071 |
| 1454 | 95% USL | | | | 25.39 | | | | | | 99% Percentile (z) | | 14.99 |
| 1455 | | | | | | | | | | | | | |
| 1456 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | | |
| 1457 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | | |
| 1458 | | | | | | | | | | | | | |
| 1459 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | | |
| 1460 | Order of Statistic, r | | | | 44 | | 95% UTL with 95% Coverage | | | | 132 | | |
| 1461 | Approx, f used to compute achieved CC | | | | 2.316 | | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.895 | | |
| 1462 | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | 59 | | |
| 1463 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | 113.9 | | 95% BCA Bootstrap UTL with 95% Coverage | | | | 113.9 | | |
| 1464 | 95% UPL | | | | 13.58 | | 90% Percentile | | | | 5.34 | | |
| 1465 | 90% Chebyshev UPL | | | | 65.06 | | 95% Percentile | | | | 10.49 | | |
| 1466 | 95% Chebyshev UPL | | | | 92.19 | | 99% Percentile | | | | 81.43 | | |
| 1467 | 95% USL | | | | 132 | | | | | | | | |
| 1468 | | | | | | | | | | | | | |
| 1469 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | | |
| 1470 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | | |
| 1471 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | | |
| 1472 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | | |
| 1473 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | | |
| 1474 | | | | | | | | | | | | | |
| 1475 | POTASSIUM, DISSOLVED | | | | | | | | | | | | |
| 1476 | | | | | | | | | | | | | |
| 1477 | General Statistics | | | | | | | | | | | | |
| 1478 | Total Number of Observations | | | | 12 | | Number of Distinct Observations | | | | 8 | | |
| 1479 | | | | | | | Number of Missing Observations | | | | 34 | | |
| 1480 | Minimum | | | | 0.95 | | First Quartile | | | | 1.075 | | |
| 1481 | Second Largest | | | | 1.6 | | Median | | | | 1.2 | | |
| 1482 | Maximum | | | | 11.4 | | Third Quartile | | | | 1.45 | | |
| 1483 | Mean | | | | 2.071 | | SD | | | | 2.946 | | |
| 1484 | Coefficient of Variation | | | | 1.423 | | Skewness | | | | 3.43 | | |
| 1485 | Mean of logged Data | | | | 0.373 | | SD of logged Data | | | | 0.672 | | |
| 1486 | | | | | | | | | | | | | |
| 1487 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | | |
| 1488 | Tolerance Factor K (For UTL) | | | | 2.736 | | d2max (for USL) | | | | 2.285 | | |
| 1489 | | | | | | | | | | | | | |
| 1490 | Normal GOF Test | | | | | | | | | | | | |
| 1491 | Shapiro Wilk Test Statistic | | | | 0.393 | | Shapiro Wilk GOF Test | | | | | | |
| 1492 | 5% Shapiro Wilk Critical Value | | | | 0.859 | | Data Not Normal at 5% Significance Level | | | | | | |
| 1493 | Lilliefors Test Statistic | | | | 0.48 | | Lilliefors GOF Test | | | | | | |
| 1494 | 5% Lilliefors Critical Value | | | | 0.243 | | Data Not Normal at 5% Significance Level | | | | | | |
| 1495 | Data Not Normal at 5% Significance Level | | | | | | | | | | | | |
| 1496 | | | | | | | | | | | | | |
| 1497 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | | |
| 1498 | 95% UTL with 95% Coverage | | | | 10.13 | | 90% Percentile (z) | | | | 5.846 | | |
| 1499 | 95% UPL (t) | | | | 7.578 | | 95% Percentile (z) | | | | 6.917 | | |
| 1500 | 95% USL | | | | 8.802 | | 99% Percentile (z) | | | | 8.924 | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|-------|---|---|---|---|---|-------|---|
| 1501 | | | | | | | | | | | | |
| 1502 | Gamma GOF Test | | | | | | | | | | | |
| 1503 | A-D Test Statistic | | | | 2.705 | | Anderson-Darling Gamma GOF Test | | | | | |
| 1504 | 5% A-D Critical Value | | | | 0.745 | | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1505 | K-S Test Statistic | | | | 0.43 | | Kolmogorov-Smirnov Gamma GOF Test | | | | | |
| 1506 | 5% K-S Critical Value | | | | 0.249 | | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1507 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 1508 | | | | | | | | | | | | |
| 1509 | Gamma Statistics | | | | | | | | | | | |
| 1510 | k hat (MLE) | | | | 1.554 | | k star (bias corrected MLE) | | | | 1.221 | |
| 1511 | Theta hat (MLE) | | | | 1.332 | | Theta star (bias corrected MLE) | | | | 1.695 | |
| 1512 | nu hat (MLE) | | | | 37.31 | | nu star (bias corrected) | | | | 29.31 | |
| 1513 | MLE Mean (bias corrected) | | | | 2.071 | | MLE Sd (bias corrected) | | | | 1.874 | |
| 1514 | | | | | | | | | | | | |
| 1515 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 1516 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | | 5.973 | | 90% Percentile | | | | 4.538 | |
| 1517 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | 5.75 | | 95% Percentile | | | | 5.785 | |
| 1518 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | 9.471 | | 99% Percentile | | | | 8.638 | |
| 1519 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | 9.378 | | | | | | | |
| 1520 | 95% WH USL | | | | 7.517 | | 95% HW USL | | | | 7.325 | |
| 1521 | | | | | | | | | | | | |
| 1522 | Lognormal GOF Test | | | | | | | | | | | |
| 1523 | Shapiro Wilk Test Statistic | | | | 0.569 | | Shapiro Wilk Lognormal GOF Test | | | | | |
| 1524 | 5% Shapiro Wilk Critical Value | | | | 0.859 | | Data Not Lognormal at 5% Significance Level | | | | | |
| 1525 | Lilliefors Test Statistic | | | | 0.359 | | Lilliefors Lognormal GOF Test | | | | | |
| 1526 | 5% Lilliefors Critical Value | | | | 0.243 | | Data Not Lognormal at 5% Significance Level | | | | | |
| 1527 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 1528 | | | | | | | | | | | | |
| 1529 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 1530 | 95% UTL with 95% Coverage | | | | 9.124 | | 90% Percentile (z) | | | | 3.435 | |
| 1531 | 95% UPL (t) | | | | 5.097 | | 95% Percentile (z) | | | | 4.384 | |
| 1532 | 95% USL | | | | 6.739 | | 99% Percentile (z) | | | | 6.929 | |
| 1533 | | | | | | | | | | | | |
| 1534 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 1535 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 1536 | | | | | | | | | | | | |
| 1537 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 1538 | Order of Statistic, r | | | | 12 | | 95% UTL with 95% Coverage | | | | 11.4 | |
| 1539 | Approx, f used to compute achieved CC | | | | 0.632 | | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.46 | |
| 1540 | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | 59 | |
| 1541 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | 11.4 | | 95% BCA Bootstrap UTL with 95% Coverage | | | | 11.4 | |
| 1542 | 95% UPL | | | | 11.4 | | 90% Percentile | | | | 1.6 | |
| 1543 | 90% Chebyshev UPL | | | | 11.27 | | 95% Percentile | | | | 6.01 | |
| 1544 | 95% Chebyshev UPL | | | | 15.44 | | 99% Percentile | | | | 10.32 | |
| 1545 | 95% USL | | | | 11.4 | | | | | | | |
| 1546 | | | | | | | | | | | | |
| 1547 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 1548 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 1549 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 1550 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|-------|---|---|---|--------------------------------|---|-------|---|
| 1551 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 1552 | | | | | | | | | | | | |
| 1553 | SODIUM, TOTAL | | | | | | | | | | | |
| 1554 | | | | | | | | | | | | |
| 1555 | General Statistics | | | | | | | | | | | |
| 1556 | Total Number of Observations | | | | 44 | | Number of Distinct Observations | | | | 34 | |
| 1557 | | | | | | | | | Number of Missing Observations | | 2 | |
| 1558 | Minimum | | | | 13.3 | | First Quartile | | | | 14.48 | |
| 1559 | Second Largest | | | | 27.5 | | Median | | | | 15.7 | |
| 1560 | Maximum | | | | 54.2 | | Third Quartile | | | | 18.55 | |
| 1561 | Mean | | | | 17.58 | | SD | | | | 6.379 | |
| 1562 | Coefficient of Variation | | | | 0.363 | | Skewness | | | | 4.678 | |
| 1563 | Mean of logged Data | | | | 2.83 | | SD of logged Data | | | | 0.241 | |
| 1564 | | | | | | | | | | | | |
| 1565 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 1566 | Tolerance Factor K (For UTL) | | | | 2.091 | | d2max (for USL) | | | | 2.906 | |
| 1567 | | | | | | | | | | | | |
| 1568 | Normal GOF Test | | | | | | | | | | | |
| 1569 | Shapiro Wilk Test Statistic | | | | 0.525 | | Shapiro Wilk GOF Test | | | | | |
| 1570 | 5% Shapiro Wilk Critical Value | | | | 0.944 | | Data Not Normal at 5% Significance Level | | | | | |
| 1571 | Lilliefors Test Statistic | | | | 0.251 | | Lilliefors GOF Test | | | | | |
| 1572 | 5% Lilliefors Critical Value | | | | 0.132 | | Data Not Normal at 5% Significance Level | | | | | |
| 1573 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 1574 | | | | | | | | | | | | |
| 1575 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 1576 | 95% UTL with 95% Coverage | | | | 30.92 | | 90% Percentile (z) | | | | 25.76 | |
| 1577 | 95% UPL (t) | | | | 28.42 | | 95% Percentile (z) | | | | 28.07 | |
| 1578 | 95% USL | | | | 36.12 | | 99% Percentile (z) | | | | 32.42 | |
| 1579 | | | | | | | | | | | | |
| 1580 | Gamma GOF Test | | | | | | | | | | | |
| 1581 | A-D Test Statistic | | | | 3.619 | | Anderson-Darling Gamma GOF Test | | | | | |
| 1582 | 5% A-D Critical Value | | | | 0.748 | | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1583 | K-S Test Statistic | | | | 0.189 | | Kolmogorov-Smirnov Gamma GOF Test | | | | | |
| 1584 | 5% K-S Critical Value | | | | 0.133 | | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1585 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 1586 | | | | | | | | | | | | |
| 1587 | Gamma Statistics | | | | | | | | | | | |
| 1588 | k hat (MLE) | | | | 13.89 | | k star (bias corrected MLE) | | | | 12.96 | |
| 1589 | Theta hat (MLE) | | | | 1.265 | | Theta star (bias corrected MLE) | | | | 1.356 | |
| 1590 | nu hat (MLE) | | | | 1223 | | nu star (bias corrected) | | | | 1141 | |
| 1591 | MLE Mean (bias corrected) | | | | 17.58 | | MLE Sd (bias corrected) | | | | 4.883 | |
| 1592 | | | | | | | | | | | | |
| 1593 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 1594 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | | 26.33 | | 90% Percentile | | | | 24.06 | |
| 1595 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | 26.11 | | 95% Percentile | | | | 26.31 | |
| 1596 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | 28.83 | | 99% Percentile | | | | 30.88 | |
| 1597 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | 28.62 | | | | | | | |
| 1598 | 95% WH USL | | | | 34.54 | | 95% HW USL | | | | 34.42 | |
| 1599 | | | | | | | | | | | | |
| 1600 | Lognormal GOF Test | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | |
|------|--|---|---|---|-------|---|---|---|---|-------|---|---|--|
| 1601 | Shapiro Wilk Test Statistic | | | | | 0.734 | Shapiro Wilk Lognormal GOF Test | | | | | | |
| 1602 | 5% Shapiro Wilk Critical Value | | | | | 0.944 | Data Not Lognormal at 5% Significance Level | | | | | | |
| 1603 | Lilliefors Test Statistic | | | | | 0.166 | Lilliefors Lognormal GOF Test | | | | | | |
| 1604 | 5% Lilliefors Critical Value | | | | | 0.132 | Data Not Lognormal at 5% Significance Level | | | | | | |
| 1605 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | | |
| 1606 | | | | | | | | | | | | | |
| 1607 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | | |
| 1608 | 95% UTL with 95% Coverage | | | | 28.06 | 90% Percentile (z) | | | | 23.09 | | | |
| 1609 | 95% UPL (t) | | | | 25.54 | 95% Percentile (z) | | | | 25.2 | | | |
| 1610 | 95% USL | | | | 34.16 | 99% Percentile (z) | | | | 29.7 | | | |
| 1611 | | | | | | | | | | | | | |
| 1612 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | | |
| 1613 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | | |
| 1614 | | | | | | | | | | | | | |
| 1615 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | | |
| 1616 | Order of Statistic, r | | | | 44 | 95% UTL with 95% Coverage | | | | 54.2 | | | |
| 1617 | Approx, f used to compute achieved CC | | | | 2.316 | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.895 | | | |
| 1618 | | | | | | Approximate Sample Size needed to achieve specified CC | | | | 59 | | | |
| 1619 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | 49.67 | 95% BCA Bootstrap UTL with 95% Coverage | | | | 49.67 | | | |
| 1620 | 95% UPL | | | | 26.63 | 90% Percentile | | | | 20.21 | | | |
| 1621 | 90% Chebyshev UPL | | | | 36.93 | 95% Percentile | | | | 23.75 | | | |
| 1622 | 95% Chebyshev UPL | | | | 45.7 | 99% Percentile | | | | 42.72 | | | |
| 1623 | 95% USL | | | | 54.2 | | | | | | | | |
| 1624 | | | | | | | | | | | | | |
| 1625 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | | |
| 1626 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | | |
| 1627 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | | |
| 1628 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | | |
| 1629 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | | |
| 1630 | | | | | | | | | | | | | |
| 1631 | SODIUM, DISSOLVED | | | | | | | | | | | | |
| 1632 | | | | | | | | | | | | | |
| 1633 | General Statistics | | | | | | | | | | | | |
| 1634 | Total Number of Observations | | | | 12 | Number of Distinct Observations | | | | 10 | | | |
| 1635 | | | | | | Number of Missing Observations | | | | 34 | | | |
| 1636 | Minimum | | | | 13 | First Quartile | | | | 14.1 | | | |
| 1637 | Second Largest | | | | 20.6 | Median | | | | 16.2 | | | |
| 1638 | Maximum | | | | 20.9 | Third Quartile | | | | 18.38 | | | |
| 1639 | Mean | | | | 16.45 | SD | | | | 2.765 | | | |
| 1640 | Coefficient of Variation | | | | 0.168 | Skewness | | | | 0.485 | | | |
| 1641 | Mean of logged Data | | | | 2.788 | SD of logged Data | | | | 0.165 | | | |
| 1642 | | | | | | | | | | | | | |
| 1643 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | | |
| 1644 | Tolerance Factor K (For UTL) | | | | 2.736 | d2max (for USL) | | | | 2.285 | | | |
| 1645 | | | | | | | | | | | | | |
| 1646 | Normal GOF Test | | | | | | | | | | | | |
| 1647 | Shapiro Wilk Test Statistic | | | | | 0.907 | Shapiro Wilk GOF Test | | | | | | |
| 1648 | 5% Shapiro Wilk Critical Value | | | | | 0.859 | Data appear Normal at 5% Significance Level | | | | | | |
| 1649 | Lilliefors Test Statistic | | | | | 0.198 | Lilliefors GOF Test | | | | | | |
| 1650 | 5% Lilliefors Critical Value | | | | | 0.243 | Data appear Normal at 5% Significance Level | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | |
|------|--|---|---|---|-------|---|---|---|---|---|--------------------|---|-------|
| 1651 | Data appear Normal at 5% Significance Level | | | | | | | | | | | | |
| 1652 | | | | | | | | | | | | | |
| 1653 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | | |
| 1654 | 95% UTL with 95% Coverage | | | | 24.02 | | | | | | 90% Percentile (z) | | 19.99 |
| 1655 | 95% UPL (t) | | | | 21.62 | | | | | | 95% Percentile (z) | | 21 |
| 1656 | 95% USL | | | | 22.77 | | | | | | 99% Percentile (z) | | 22.88 |
| 1657 | | | | | | | | | | | | | |
| 1658 | Gamma GOF Test | | | | | | | | | | | | |
| 1659 | A-D Test Statistic | | | | 0.45 | | Anderson-Darling Gamma GOF Test | | | | | | |
| 1660 | 5% A-D Critical Value | | | | 0.73 | | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | |
| 1661 | K-S Test Statistic | | | | 0.207 | | Kolmogorov-Smirnov Gamma GOF Test | | | | | | |
| 1662 | 5% K-S Critical Value | | | | 0.245 | | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | |
| 1663 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | | | | | | | |
| 1664 | | | | | | | | | | | | | |
| 1665 | Gamma Statistics | | | | | | | | | | | | |
| 1666 | k hat (MLE) | | | | 39.71 | | k star (bias corrected MLE) | | | | 29.84 | | |
| 1667 | Theta hat (MLE) | | | | 0.414 | | Theta star (bias corrected MLE) | | | | 0.551 | | |
| 1668 | nu hat (MLE) | | | | 953.1 | | nu star (bias corrected) | | | | 716.1 | | |
| 1669 | MLE Mean (bias corrected) | | | | 16.45 | | MLE Sd (bias corrected) | | | | 3.011 | | |
| 1670 | | | | | | | | | | | | | |
| 1671 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | | |
| 1672 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | | 21.92 | | 90% Percentile | | | | 20.41 | | |
| 1673 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | 21.97 | | 95% Percentile | | | | 21.7 | | |
| 1674 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | 24.91 | | 99% Percentile | | | | 24.25 | | |
| 1675 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | 25.05 | | | | | | | | |
| 1676 | 95% WH USL | | | | 23.33 | | 95% HW USL | | | | 23.41 | | |
| 1677 | | | | | | | | | | | | | |
| 1678 | Lognormal GOF Test | | | | | | | | | | | | |
| 1679 | Shapiro Wilk Test Statistic | | | | 0.92 | | Shapiro Wilk Lognormal GOF Test | | | | | | |
| 1680 | 5% Shapiro Wilk Critical Value | | | | 0.859 | | Data appear Lognormal at 5% Significance Level | | | | | | |
| 1681 | Lilliefors Test Statistic | | | | 0.196 | | Lilliefors Lognormal GOF Test | | | | | | |
| 1682 | 5% Lilliefors Critical Value | | | | 0.243 | | Data appear Lognormal at 5% Significance Level | | | | | | |
| 1683 | Data appear Lognormal at 5% Significance Level | | | | | | | | | | | | |
| 1684 | | | | | | | | | | | | | |
| 1685 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | | |
| 1686 | 95% UTL with 95% Coverage | | | | 25.52 | | 90% Percentile (z) | | | | 20.07 | | |
| 1687 | 95% UPL (t) | | | | 22.12 | | 95% Percentile (z) | | | | 21.31 | | |
| 1688 | 95% USL | | | | 23.69 | | 99% Percentile (z) | | | | 23.85 | | |
| 1689 | | | | | | | | | | | | | |
| 1690 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | | |
| 1691 | Data appear Normal at 5% Significance Level | | | | | | | | | | | | |
| 1692 | | | | | | | | | | | | | |
| 1693 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | | |
| 1694 | Order of Statistic, r | | | | 12 | | 95% UTL with 95% Coverage | | | | 20.9 | | |
| 1695 | Approx, f used to compute achieved CC | | | | 0.632 | | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.46 | | |
| 1696 | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | 59 | | |
| 1697 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | 20.9 | | 95% BCA Bootstrap UTL with 95% Coverage | | | | 20.9 | | |
| 1698 | 95% UPL | | | | 20.9 | | 90% Percentile | | | | 20.49 | | |
| 1699 | 90% Chebyshev UPL | | | | 25.08 | | 95% Percentile | | | | 20.74 | | |
| 1700 | 95% Chebyshev UPL | | | | 29 | | 99% Percentile | | | | 20.87 | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|--|-------|---|---|---|---|---|-------|
| 1701 | | | | | 95% USL | 20.9 | | | | | | |
| 1702 | | | | | | | | | | | | |
| 1703 | | | | | | | | | | | | |
| 1704 | | | | | | | | | | | | |
| 1705 | | | | | | | | | | | | |
| 1706 | | | | | | | | | | | | |
| 1707 | | | | | | | | | | | | |
| 1708 | | | | | | | | | | | | |
| 1709 | | | | | | | | | | | | |
| 1710 | | | | | | | | | | | | |
| 1711 | | | | | | | | | | | | |
| 1712 | | | | | Total Number of Observations | 45 | | | | Number of Distinct Observations | | 36 |
| 1713 | | | | | | | | | | Number of Missing Observations | | 1 |
| 1714 | | | | | Minimum | 5 | | | | First Quartile | | 306 |
| 1715 | | | | | Second Largest | 661 | | | | Median | | 331 |
| 1716 | | | | | Maximum | 684 | | | | Third Quartile | | 350 |
| 1717 | | | | | Mean | 336.9 | | | | SD | | 105.6 |
| 1718 | | | | | Coefficient of Variation | 0.313 | | | | Skewness | | 1.041 |
| 1719 | | | | | Mean of logged Data | 5.72 | | | | SD of logged Data | | 0.666 |
| 1720 | | | | | | | | | | | | |
| 1721 | | | | | | | | | | | | |
| 1722 | | | | | Tolerance Factor K (For UTL) | 2.085 | | | | d2max (for USL) | | 2.915 |
| 1723 | | | | | | | | | | | | |
| 1724 | | | | | | | | | | | | |
| 1725 | | | | | Shapiro Wilk Test Statistic | 0.775 | | | | Shapiro Wilk GOF Test | | |
| 1726 | | | | | 5% Shapiro Wilk Critical Value | 0.945 | | | | Data Not Normal at 5% Significance Level | | |
| 1727 | | | | | Lilliefors Test Statistic | 0.28 | | | | Lilliefors GOF Test | | |
| 1728 | | | | | 5% Lilliefors Critical Value | 0.131 | | | | Data Not Normal at 5% Significance Level | | |
| 1729 | | | | | | | | | | | | |
| 1730 | | | | | | | | | | | | |
| 1731 | | | | | | | | | | | | |
| 1732 | | | | | 95% UTL with 95% Coverage | 557 | | | | 90% Percentile (z) | | 472.2 |
| 1733 | | | | | 95% UPL (t) | 516.3 | | | | 95% Percentile (z) | | 510.6 |
| 1734 | | | | | 95% USL | 644.7 | | | | 99% Percentile (z) | | 582.5 |
| 1735 | | | | | | | | | | | | |
| 1736 | | | | | | | | | | | | |
| 1737 | | | | | A-D Test Statistic | 5.867 | | | | Anderson-Darling Gamma GOF Test | | |
| 1738 | | | | | 5% A-D Critical Value | 0.753 | | | | Data Not Gamma Distributed at 5% Significance Level | | |
| 1739 | | | | | K-S Test Statistic | 0.28 | | | | Kolmogorov-Smirnov Gamma GOF Test | | |
| 1740 | | | | | 5% K-S Critical Value | 0.132 | | | | Data Not Gamma Distributed at 5% Significance Level | | |
| 1741 | | | | | | | | | | | | |
| 1742 | | | | | | | | | | | | |
| 1743 | | | | | | | | | | | | |
| 1744 | | | | | k hat (MLE) | 5.18 | | | | k star (bias corrected MLE) | | 4.85 |
| 1745 | | | | | Theta hat (MLE) | 65.03 | | | | Theta star (bias corrected MLE) | | 69.47 |
| 1746 | | | | | nu hat (MLE) | 466.2 | | | | nu star (bias corrected) | | 436.5 |
| 1747 | | | | | MLE Mean (bias corrected) | 336.9 | | | | MLE Sd (bias corrected) | | 153 |
| 1748 | | | | | | | | | | | | |
| 1749 | | | | | | | | | | | | |
| 1750 | | | | | 95% Wilson Hilferty (WH) Approx. Gamma UPL | 609 | | | | 90% Percentile | | 541.7 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|---------------------------------------|-------|---|---|---|---|---|-------|
| 1751 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | | 649.5 | 95% Percentile | | | | | 621.4 |
| 1752 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | 95% Coverage | 692.3 | 99% Percentile | | | | | 790.1 |
| 1753 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | 95% Coverage | 751.6 | | | | | | |
| 1754 | 95% WH USL | | | | 95% WH USL | 896.5 | 95% HW USL | | | | | 1012 |
| 1755 | | | | | | | | | | | | |
| 1756 | Lognormal GOF Test | | | | | | | | | | | |
| 1757 | Shapiro Wilk Test Statistic | | | | | 0.427 | Shapiro Wilk Lognormal GOF Test | | | | | |
| 1758 | 5% Shapiro Wilk Critical Value | | | | | 0.945 | Data Not Lognormal at 5% Significance Level | | | | | |
| 1759 | Lilliefors Test Statistic | | | | | 0.321 | Lilliefors Lognormal GOF Test | | | | | |
| 1760 | 5% Lilliefors Critical Value | | | | | 0.131 | Data Not Lognormal at 5% Significance Level | | | | | |
| 1761 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 1762 | | | | | | | | | | | | |
| 1763 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 1764 | 95% UTL with 95% Coverage | | | | 95% Coverage | 1224 | 90% Percentile (z) | | | | | 716.3 |
| 1765 | 95% UPL (t) | | | | 95% UPL (t) | 945.9 | 95% Percentile (z) | | | | | 912.5 |
| 1766 | 95% USL | | | | 95% USL | 2128 | 99% Percentile (z) | | | | | 1437 |
| 1767 | | | | | | | | | | | | |
| 1768 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 1769 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 1770 | | | | | | | | | | | | |
| 1771 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 1772 | Order of Statistic, r | | | | Order of Statistic, r | 44 | 95% UTL with 95% Coverage | | | | | 661 |
| 1773 | Approx, f used to compute achieved CC | | | | Approx, f used to compute achieved CC | 1.158 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.665 |
| 1774 | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | | 93 |
| 1775 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | 95% Coverage | 665.2 | 95% BCA Bootstrap UTL with 95% Coverage | | | | | 661 |
| 1776 | 95% UPL | | | | 95% UPL | 639.7 | 90% Percentile | | | | | 377 |
| 1777 | 90% Chebyshev UPL | | | | 90% Chebyshev UPL | 657.1 | 95% Percentile | | | | | 565.2 |
| 1778 | 95% Chebyshev UPL | | | | 95% Chebyshev UPL | 802.2 | 99% Percentile | | | | | 673.9 |
| 1779 | 95% USL | | | | 95% USL | 684 | | | | | | |
| 1780 | | | | | | | | | | | | |
| 1781 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 1782 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 1783 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 1784 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 1785 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 1786 | | | | | | | | | | | | |
| 1787 | SPEC. COND., LAB | | | | | | | | | | | |
| 1788 | | | | | | | | | | | | |
| 1789 | General Statistics | | | | | | | | | | | |
| 1790 | Total Number of Observations | | | | Total Number of Observations | 45 | Number of Distinct Observations | | | | | 37 |
| 1791 | | | | | | | Number of Missing Observations | | | | | 1 |
| 1792 | Minimum | | | | Minimum | 242 | First Quartile | | | | | 277 |
| 1793 | Second Largest | | | | Second Largest | 790 | Median | | | | | 302 |
| 1794 | Maximum | | | | Maximum | 1020 | Third Quartile | | | | | 338 |
| 1795 | Mean | | | | Mean | 346.8 | SD | | | | | 146.9 |
| 1796 | Coefficient of Variation | | | | Coefficient of Variation | 0.424 | Skewness | | | | | 3.204 |
| 1797 | Mean of logged Data | | | | Mean of logged Data | 5.795 | SD of logged Data | | | | | 0.297 |
| 1798 | | | | | | | | | | | | |
| 1799 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 1800 | Tolerance Factor K (For UTL) | | | | Tolerance Factor K (For UTL) | 2.085 | d2max (for USL) | | | | | 2.915 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|-------|-------|---|---|---|---------------------------------|---|-------|
| 1801 | | | | | | | | | | | | |
| 1802 | Normal GOF Test | | | | | | | | | | | |
| 1803 | Shapiro Wilk Test Statistic | | | | | 0.59 | Shapiro Wilk GOF Test | | | | | |
| 1804 | 5% Shapiro Wilk Critical Value | | | | | 0.945 | Data Not Normal at 5% Significance Level | | | | | |
| 1805 | Lilliefors Test Statistic | | | | | 0.289 | Lilliefors GOF Test | | | | | |
| 1806 | 5% Lilliefors Critical Value | | | | | 0.131 | Data Not Normal at 5% Significance Level | | | | | |
| 1807 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 1808 | | | | | | | | | | | | |
| 1809 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 1810 | 95% UTL with 95% Coverage | | | | 653.2 | | | | | 90% Percentile (z) | | 535.1 |
| 1811 | 95% UPL (t) | | | | 596.4 | | | | | 95% Percentile (z) | | 588.5 |
| 1812 | 95% USL | | | | 775.2 | | | | | 99% Percentile (z) | | 688.6 |
| 1813 | | | | | | | | | | | | |
| 1814 | Gamma GOF Test | | | | | | | | | | | |
| 1815 | A-D Test Statistic | | | | | 4.727 | Anderson-Darling Gamma GOF Test | | | | | |
| 1816 | 5% A-D Critical Value | | | | | 0.749 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1817 | K-S Test Statistic | | | | | 0.244 | Kolmogorov-Smirnov Gamma GOF Test | | | | | |
| 1818 | 5% K-S Critical Value | | | | | 0.132 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1819 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 1820 | | | | | | | | | | | | |
| 1821 | Gamma Statistics | | | | | | | | | | | |
| 1822 | k hat (MLE) | | | | 9.41 | | | | | k star (bias corrected MLE) | | 8.797 |
| 1823 | Theta hat (MLE) | | | | 36.86 | | | | | Theta star (bias corrected MLE) | | 39.42 |
| 1824 | nu hat (MLE) | | | | 846.9 | | | | | nu star (bias corrected) | | 791.7 |
| 1825 | MLE Mean (bias corrected) | | | | 346.8 | | | | | MLE Sd (bias corrected) | | 116.9 |
| 1826 | | | | | | | | | | | | |
| 1827 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 1828 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | | 559.9 | | | | | 90% Percentile | | 502.6 |
| 1829 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | 555.8 | | | | | 95% Percentile | | 558.8 |
| 1830 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | 622.7 | | | | | 99% Percentile | | 674.9 |
| 1831 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | 619.4 | | | | | | | |
| 1832 | 95% WH USL | | | | 773 | | | | | 95% HW USL | | 774.3 |
| 1833 | | | | | | | | | | | | |
| 1834 | Lognormal GOF Test | | | | | | | | | | | |
| 1835 | Shapiro Wilk Test Statistic | | | | | 0.741 | Shapiro Wilk Lognormal GOF Test | | | | | |
| 1836 | 5% Shapiro Wilk Critical Value | | | | | 0.945 | Data Not Lognormal at 5% Significance Level | | | | | |
| 1837 | Lilliefors Test Statistic | | | | | 0.218 | Lilliefors Lognormal GOF Test | | | | | |
| 1838 | 5% Lilliefors Critical Value | | | | | 0.131 | Data Not Lognormal at 5% Significance Level | | | | | |
| 1839 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 1840 | | | | | | | | | | | | |
| 1841 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 1842 | 95% UTL with 95% Coverage | | | | 610.5 | | | | | 90% Percentile (z) | | 480.8 |
| 1843 | 95% UPL (t) | | | | 544.3 | | | | | 95% Percentile (z) | | 535.7 |
| 1844 | 95% USL | | | | 781.3 | | | | | 99% Percentile (z) | | 655.9 |
| 1845 | | | | | | | | | | | | |
| 1846 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 1847 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 1848 | | | | | | | | | | | | |
| 1849 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 1850 | Order of Statistic, r | | | | 44 | | | | | 95% UTL with 95% Coverage | | 790 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|---|-------|---|---|---|---|---|-------|
| 1851 | Approx, f used to compute achieved CC | | | | | 1.158 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.665 |
| 1852 | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | | 93 |
| 1853 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | | 974 | 95% BCA Bootstrap UTL with 95% Coverage | | | | | 947.2 |
| 1854 | 95% UPL | | | | | 749.8 | 90% Percentile | | | | | 430.4 |
| 1855 | 90% Chebyshev UPL | | | | | 792.5 | 95% Percentile | | | | | 642.6 |
| 1856 | 95% Chebyshev UPL | | | | | 994.4 | 99% Percentile | | | | | 918.8 |
| 1857 | 95% USL | | | | | 1020 | | | | | | |
| 1858 | | | | | | | | | | | | |
| 1859 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 1860 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 1861 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 1862 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 1863 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 1864 | | | | | | | | | | | | |
| 1865 | SULFATE | | | | | | | | | | | |
| 1866 | | | | | | | | | | | | |
| 1867 | General Statistics | | | | | | | | | | | |
| 1868 | Total Number of Observations | | | | | 44 | Number of Distinct Observations | | | | | 39 |
| 1869 | | | | | | | Number of Missing Observations | | | | | 2 |
| 1870 | Minimum | | | | | 6.9 | First Quartile | | | | | 9.775 |
| 1871 | Second Largest | | | | | 74 | Median | | | | | 12.3 |
| 1872 | Maximum | | | | | 188 | Third Quartile | | | | | 23.38 |
| 1873 | Mean | | | | | 23.66 | SD | | | | | 29.73 |
| 1874 | Coefficient of Variation | | | | | 1.257 | Skewness | | | | | 4.264 |
| 1875 | Mean of logged Data | | | | | 2.817 | SD of logged Data | | | | | 0.733 |
| 1876 | | | | | | | | | | | | |
| 1877 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 1878 | Tolerance Factor K (For UTL) | | | | | 2.091 | d2max (for USL) | | | | | 2.906 |
| 1879 | | | | | | | | | | | | |
| 1880 | Normal GOF Test | | | | | | | | | | | |
| 1881 | Shapiro Wilk Test Statistic | | | | | 0.538 | Shapiro Wilk GOF Test | | | | | |
| 1882 | 5% Shapiro Wilk Critical Value | | | | | 0.944 | Data Not Normal at 5% Significance Level | | | | | |
| 1883 | Lilliefors Test Statistic | | | | | 0.287 | Lilliefors GOF Test | | | | | |
| 1884 | 5% Lilliefors Critical Value | | | | | 0.132 | Data Not Normal at 5% Significance Level | | | | | |
| 1885 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 1886 | | | | | | | | | | | | |
| 1887 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 1888 | 95% UTL with 95% Coverage | | | | | 85.83 | 90% Percentile (z) | | | | | 61.76 |
| 1889 | 95% UPL (t) | | | | | 74.21 | 95% Percentile (z) | | | | | 72.56 |
| 1890 | 95% USL | | | | | 110.1 | 99% Percentile (z) | | | | | 92.83 |
| 1891 | | | | | | | | | | | | |
| 1892 | Gamma GOF Test | | | | | | | | | | | |
| 1893 | A-D Test Statistic | | | | | 2.834 | Anderson-Darling Gamma GOF Test | | | | | |
| 1894 | 5% A-D Critical Value | | | | | 0.766 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1895 | K-S Test Statistic | | | | | 0.232 | Kolmogorov-Smirnov Gamma GOF Test | | | | | |
| 1896 | 5% K-S Critical Value | | | | | 0.136 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1897 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 1898 | | | | | | | | | | | | |
| 1899 | Gamma Statistics | | | | | | | | | | | |
| 1900 | k hat (MLE) | | | | | 1.587 | k star (bias corrected MLE) | | | | | 1.494 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|---|-------|---|---|---|---|---|-------|
| 1901 | Theta hat (MLE) | | | | | 14.91 | Theta star (bias corrected MLE) | | | | | 15.84 |
| 1902 | nu hat (MLE) | | | | | 139.6 | nu star (bias corrected) | | | | | 131.4 |
| 1903 | MLE Mean (bias corrected) | | | | | 23.66 | MLE Sd (bias corrected) | | | | | 19.36 |
| 1904 | | | | | | | | | | | | |
| 1905 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 1906 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | | | 60.53 | 90% Percentile | | | | | 49.35 |
| 1907 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | | 59.62 | 95% Percentile | | | | | 61.71 |
| 1908 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | | 75.26 | 99% Percentile | | | | | 89.64 |
| 1909 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | | 75.16 | | | | | | |
| 1910 | 95% WH USL | | | | | 113.3 | 95% HW USL | | | | | 117.2 |
| 1911 | | | | | | | | | | | | |
| 1912 | Lognormal GOF Test | | | | | | | | | | | |
| 1913 | Shapiro Wilk Test Statistic | | | | | 0.882 | Shapiro Wilk Lognormal GOF Test | | | | | |
| 1914 | 5% Shapiro Wilk Critical Value | | | | | 0.944 | Data Not Lognormal at 5% Significance Level | | | | | |
| 1915 | Lilliefors Test Statistic | | | | | 0.21 | Lilliefors Lognormal GOF Test | | | | | |
| 1916 | 5% Lilliefors Critical Value | | | | | 0.132 | Data Not Lognormal at 5% Significance Level | | | | | |
| 1917 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 1918 | | | | | | | | | | | | |
| 1919 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 1920 | 95% UTL with 95% Coverage | | | | | 77.5 | 90% Percentile (z) | | | | | 42.8 |
| 1921 | 95% UPL (t) | | | | | 58.18 | 95% Percentile (z) | | | | | 55.87 |
| 1922 | 95% USL | | | | | 140.9 | 99% Percentile (z) | | | | | 92.1 |
| 1923 | | | | | | | | | | | | |
| 1924 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 1925 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 1926 | | | | | | | | | | | | |
| 1927 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 1928 | Order of Statistic, r | | | | | 44 | 95% UTL with 95% Coverage | | | | | 188 |
| 1929 | Approx, f used to compute achieved CC | | | | | 2.316 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.895 |
| 1930 | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | | 59 |
| 1931 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | | 168.9 | 95% BCA Bootstrap UTL with 95% Coverage | | | | | 168.9 |
| 1932 | 95% UPL | | | | | 70.6 | 90% Percentile | | | | | 45.7 |
| 1933 | 90% Chebyshev UPL | | | | | 113.9 | 95% Percentile | | | | | 59.1 |
| 1934 | 95% Chebyshev UPL | | | | | 154.7 | 99% Percentile | | | | | 139 |
| 1935 | 95% USL | | | | | 188 | | | | | | |
| 1936 | | | | | | | | | | | | |
| 1937 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 1938 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 1939 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 1940 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 1941 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 1942 | | | | | | | | | | | | |
| 1943 | ALKALINITY | | | | | | | | | | | |
| 1944 | | | | | | | | | | | | |
| 1945 | General Statistics | | | | | | | | | | | |
| 1946 | Total Number of Observations | | | | | 45 | Number of Missing Observations | | | | | 1 |
| 1947 | Number of Distinct Observations | | | | | 14 | | | | | | |
| 1948 | Number of Detects | | | | | 20 | Number of Non-Detects | | | | | 25 |
| 1949 | Number of Distinct Detects | | | | | 14 | Number of Distinct Non-Detects | | | | | 1 |
| 1950 | Minimum Detect | | | | | 5 | Minimum Non-Detect | | | | | 5 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|-------|---|---|---|---|--------|---|---|
| 1951 | Maximum Detect | | | | 182 | Maximum Non-Detect | | | | 5 | | |
| 1952 | Variance Detected | | | | 3029 | Percent Non-Detects | | | | 55.56% | | |
| 1953 | Mean Detected | | | | 42.2 | SD Detected | | | | 55.03 | | |
| 1954 | Mean of Detected Logged Data | | | | 2.904 | SD of Detected Logged Data | | | | 1.329 | | |
| 1955 | | | | | | | | | | | | |
| 1956 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 1957 | Tolerance Factor K (For UTL) | | | | 2.085 | d2max (for USL) | | | | 2.915 | | |
| 1958 | | | | | | | | | | | | |
| 1959 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 1960 | Shapiro Wilk Test Statistic | | | | 0.725 | Shapiro Wilk GOF Test | | | | | | |
| 1961 | 5% Shapiro Wilk Critical Value | | | | 0.905 | Data Not Normal at 5% Significance Level | | | | | | |
| 1962 | Lilliefors Test Statistic | | | | 0.283 | Lilliefors GOF Test | | | | | | |
| 1963 | 5% Lilliefors Critical Value | | | | 0.192 | Data Not Normal at 5% Significance Level | | | | | | |
| 1964 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 1965 | | | | | | | | | | | | |
| 1966 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 1967 | KM Mean | | | | 21.53 | KM SD | | | | 40.25 | | |
| 1968 | 95% UTL95% Coverage | | | | 105.5 | 95% KM UPL (t) | | | | 89.92 | | |
| 1969 | 90% KM Percentile (z) | | | | 73.12 | 95% KM Percentile (z) | | | | 87.75 | | |
| 1970 | 99% KM Percentile (z) | | | | 115.2 | 95% KM USL | | | | 138.9 | | |
| 1971 | | | | | | | | | | | | |
| 1972 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 1973 | Mean | | | | 20.14 | SD | | | | 41.3 | | |
| 1974 | 95% UTL95% Coverage | | | | 106.3 | 95% UPL (t) | | | | 90.31 | | |
| 1975 | 90% Percentile (z) | | | | 73.07 | 95% Percentile (z) | | | | 88.08 | | |
| 1976 | 99% Percentile (z) | | | | 116.2 | 95% USL | | | | 140.6 | | |
| 1977 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | |
| 1978 | | | | | | | | | | | | |
| 1979 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | |
| 1980 | A-D Test Statistic | | | | 1.479 | Anderson-Darling GOF Test | | | | | | |
| 1981 | 5% A-D Critical Value | | | | 0.782 | Data Not Gamma Distributed at 5% Significance Level | | | | | | |
| 1982 | K-S Test Statistic | | | | 0.263 | Kolmogorov-Smirnov GOF | | | | | | |
| 1983 | 5% K-S Critical Value | | | | 0.202 | Data Not Gamma Distributed at 5% Significance Level | | | | | | |
| 1984 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 1985 | | | | | | | | | | | | |
| 1986 | Gamma Statistics on Detected Data Only | | | | | | | | | | | |
| 1987 | k hat (MLE) | | | | 0.718 | k star (bias corrected MLE) | | | | 0.644 | | |
| 1988 | Theta hat (MLE) | | | | 58.77 | Theta star (bias corrected MLE) | | | | 65.56 | | |
| 1989 | nu hat (MLE) | | | | 28.72 | nu star (bias corrected) | | | | 25.75 | | |
| 1990 | MLE Mean (bias corrected) | | | | 42.2 | | | | | | | |
| 1991 | MLE Sd (bias corrected) | | | | 52.6 | 95% Percentile of Chisquare (2kstar) | | | | 4.516 | | |
| 1992 | | | | | | | | | | | | |
| 1993 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | |
| 1994 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1995 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | |
| 1996 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | |
| 1997 | This is especially true when the sample size is small. | | | | | | | | | | | |
| 1998 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1999 | Minimum | | | | 0.01 | Mean | | | | 18.76 | | |
| 2000 | Maximum | | | | 182 | Median | | | | 0.01 | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | |
|------|--|---|---|---|---|-------|-------|---|---|---|---|-------|-------|
| 2001 | | | | | SD | 41.92 | | | | | CV | 2.234 | |
| 2002 | | | | | k hat (MLE) | 0.178 | | | | | k star (bias corrected MLE) | 0.181 | |
| 2003 | | | | | Theta hat (MLE) | 105.2 | | | | | Theta star (bias corrected MLE) | 103.5 | |
| 2004 | | | | | nu hat (MLE) | 16.05 | | | | | nu star (bias corrected) | 16.32 | |
| 2005 | | | | | MLE Mean (bias corrected) | 18.76 | | | | | MLE Sd (bias corrected) | 44.06 | |
| 2006 | | | | | 95% Percentile of Chisquare (2kstar) | 1.915 | | | | | 90% Percentile | 56.6 | |
| 2007 | | | | | 95% Percentile | 99.08 | | | | | 99% Percentile | 218 | |
| 2008 | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | | | | | |
| 2009 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | |
| 2010 | | | | | WH | HW | | | | | WH | HW | |
| 2011 | | | | | 95% Approx. Gamma UTL with 95% Coverage | 110.8 | 128.8 | | | | 95% Approx. Gamma UPL | 72.73 | 76.45 |
| 2012 | | | | | 95% Gamma USL | 233 | 327.4 | | | | | | |
| 2013 | | | | | | | | | | | | | |
| 2014 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | | |
| 2015 | | | | | Mean (KM) | 21.53 | | | | | SD (KM) | 40.25 | |
| 2016 | | | | | Variance (KM) | 1620 | | | | | SE of Mean (KM) | 6.157 | |
| 2017 | | | | | k hat (KM) | 0.286 | | | | | k star (KM) | 0.282 | |
| 2018 | | | | | nu hat (KM) | 25.75 | | | | | nu star (KM) | 25.37 | |
| 2019 | | | | | theta hat (KM) | 75.25 | | | | | theta star (KM) | 76.39 | |
| 2020 | | | | | 80% gamma percentile (KM) | 32.49 | | | | | 90% gamma percentile (KM) | 63.95 | |
| 2021 | | | | | 95% gamma percentile (KM) | 100.5 | | | | | 99% gamma percentile (KM) | 196.1 | |
| 2022 | | | | | | | | | | | | | |
| 2023 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | | |
| 2024 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | |
| 2025 | | | | | WH | HW | | | | | WH | HW | |
| 2026 | | | | | 95% Approx. Gamma UTL with 95% Coverage | 90.06 | 88.29 | | | | 95% Approx. Gamma UPL | 67.27 | 64.24 |
| 2027 | | | | | 95% KM Gamma Percentile | 64.44 | 61.32 | | | | 95% Gamma USL | 155.3 | 162.2 |
| 2028 | | | | | | | | | | | | | |
| 2029 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | | |
| 2030 | | | | | Shapiro Wilk Test Statistic | 0.844 | | | | | Shapiro Wilk GOF Test | | |
| 2031 | | | | | 5% Shapiro Wilk Critical Value | 0.905 | | | | | Data Not Lognormal at 5% Significance Level | | |
| 2032 | | | | | Lilliefors Test Statistic | 0.225 | | | | | Lilliefors GOF Test | | |
| 2033 | | | | | 5% Lilliefors Critical Value | 0.192 | | | | | Data Not Lognormal at 5% Significance Level | | |
| 2034 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | | |
| 2035 | | | | | | | | | | | | | |
| 2036 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | | |
| 2037 | | | | | Mean in Original Scale | 19.18 | | | | | Mean in Log Scale | 0.754 | |
| 2038 | | | | | SD in Original Scale | 41.73 | | | | | SD in Log Scale | 2.38 | |
| 2039 | | | | | 95% UTL95% Coverage | 303.7 | | | | | 95% BCA UTL95% Coverage | 168.2 | |
| 2040 | | | | | 95% Bootstrap (%) UTL95% Coverage | 176.4 | | | | | 95% UPL (t) | 121.1 | |
| 2041 | | | | | 90% Percentile (z) | 44.86 | | | | | 95% Percentile (z) | 106.5 | |
| 2042 | | | | | 99% Percentile (z) | 539.3 | | | | | 95% USL | 2191 | |
| 2043 | | | | | | | | | | | | | |
| 2044 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | | |
| 2045 | | | | | KM Mean of Logged Data | 2.185 | | | | | 95% KM UTL (Lognormal)95% Coverage | 83.9 | |
| 2046 | | | | | KM SD of Logged Data | 1.077 | | | | | 95% KM UPL (Lognormal) | 55.35 | |
| 2047 | | | | | 95% KM Percentile Lognormal (z) | 52.23 | | | | | 95% KM USL (Lognormal) | 205.1 | |
| 2048 | | | | | | | | | | | | | |
| 2049 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | | |
| 2050 | | | | | Mean in Original Scale | 20.14 | | | | | Mean in Log Scale | 1.8 | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|--|---|-------|---|---|---|---|---|-------|
| 2051 | | | | SD in Original Scale | | 41.3 | | | | SD in Log Scale | | 1.327 |
| 2052 | | | | 95% UTL95% Coverage | | 96.13 | | | | 95% UPL (t) | | 57.59 |
| 2053 | | | | 90% Percentile (z) | | 33.11 | | | | 95% Percentile (z) | | 53.61 |
| 2054 | | | | 99% Percentile (z) | | 132.4 | | | | 95% USL | | 289.2 |
| 2055 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 2056 | | | | | | | | | | | | |
| 2057 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 2058 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 2059 | | | | | | | | | | | | |
| 2060 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 2061 | | | | Order of Statistic, r | | 44 | | | | 95% UTL with95% Coverage | | 154 |
| 2062 | | | | Approx, f used to compute achieved CC | | 1.158 | | | | Approximate Actual Confidence Coefficient achieved by UTL | | 0.665 |
| 2063 | | | | Approximate Sample Size needed to achieve specified CC | | 93 | | | | 95% UPL | | 141.7 |
| 2064 | | | | 95% USL | | 182 | | | | 95% KM Chebyshev UPL | | 198.9 |
| 2065 | | | | | | | | | | | | |
| 2066 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 2067 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 2068 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 2069 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 2070 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 2071 | | | | | | | | | | | | |
| 2072 | TDS (TOTAL DISSOLVED SOLIDS) | | | | | | | | | | | |
| 2073 | | | | | | | | | | | | |
| 2074 | General Statistics | | | | | | | | | | | |
| 2075 | | | | Total Number of Observations | | 45 | | | | Number of Distinct Observations | | 42 |
| 2076 | | | | | | | | | | Number of Missing Observations | | 1 |
| 2077 | | | | Minimum | | 135 | | | | First Quartile | | 199 |
| 2078 | | | | Second Largest | | 447 | | | | Median | | 238 |
| 2079 | | | | Maximum | | 619 | | | | Third Quartile | | 265 |
| 2080 | | | | Mean | | 247.9 | | | | SD | | 86.37 |
| 2081 | | | | Coefficient of Variation | | 0.348 | | | | Skewness | | 2.295 |
| 2082 | | | | Mean of logged Data | | 5.467 | | | | SD of logged Data | | 0.293 |
| 2083 | | | | | | | | | | | | |
| 2084 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 2085 | | | | Tolerance Factor K (For UTL) | | 2.085 | | | | d2max (for USL) | | 2.915 |
| 2086 | | | | | | | | | | | | |
| 2087 | Normal GOF Test | | | | | | | | | | | |
| 2088 | | | | Shapiro Wilk Test Statistic | | 0.799 | | | | Shapiro Wilk GOF Test | | |
| 2089 | | | | 5% Shapiro Wilk Critical Value | | 0.945 | | | | Data Not Normal at 5% Significance Level | | |
| 2090 | | | | Lilliefors Test Statistic | | 0.195 | | | | Lilliefors GOF Test | | |
| 2091 | | | | 5% Lilliefors Critical Value | | 0.131 | | | | Data Not Normal at 5% Significance Level | | |
| 2092 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 2093 | | | | | | | | | | | | |
| 2094 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 2095 | | | | 95% UTL with 95% Coverage | | 428 | | | | 90% Percentile (z) | | 358.6 |
| 2096 | | | | 95% UPL (t) | | 394.6 | | | | 95% Percentile (z) | | 390 |
| 2097 | | | | 95% USL | | 499.7 | | | | 99% Percentile (z) | | 448.8 |
| 2098 | | | | | | | | | | | | |
| 2099 | Gamma GOF Test | | | | | | | | | | | |
| 2100 | | | | A-D Test Statistic | | 1.345 | | | | Anderson-Darling Gamma GOF Test | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | |
|------|--|---|---|--|---|-------|---|---|---|---|---|---|--|
| 2101 | | | | 5% A-D Critical Value | | 0.748 | | | | | | Data Not Gamma Distributed at 5% Significance Level | |
| 2102 | | | | K-S Test Statistic | | 0.145 | | | | | | Kolmogorov-Smirnov Gamma GOF Test | |
| 2103 | | | | 5% K-S Critical Value | | 0.132 | | | | | | Data Not Gamma Distributed at 5% Significance Level | |
| 2104 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | | |
| 2105 | | | | | | | | | | | | | |
| 2106 | Gamma Statistics | | | | | | | | | | | | |
| 2107 | | | | k hat (MLE) | | 11.02 | | | | | | k star (bias corrected MLE) | 10.3 |
| 2108 | | | | Theta hat (MLE) | | 22.5 | | | | | | Theta star (bias corrected MLE) | 24.07 |
| 2109 | | | | nu hat (MLE) | | 991.7 | | | | | | nu star (bias corrected) | 926.9 |
| 2110 | | | | MLE Mean (bias corrected) | | 247.9 | | | | | | MLE Sd (bias corrected) | 77.25 |
| 2111 | | | | | | | | | | | | | |
| 2112 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | | |
| 2113 | | | | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | 388.7 | | | | | | 90% Percentile | 350.6 |
| 2114 | | | | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | 388.6 | | | | | | 95% Percentile | 387.1 |
| 2115 | | | | 95% WH Approx. Gamma UTL with 95% Coverage | | 429.4 | | | | | | 99% Percentile | 462 |
| 2116 | | | | 95% HW Approx. Gamma UTL with 95% Coverage | | 430.5 | | | | | | | |
| 2117 | | | | 95% WH USL | | 526.1 | | | | | | 95% HW USL | 532.1 |
| 2118 | | | | | | | | | | | | | |
| 2119 | Lognormal GOF Test | | | | | | | | | | | | |
| 2120 | | | | Shapiro Wilk Test Statistic | | 0.936 | | | | | | | Shapiro Wilk Lognormal GOF Test |
| 2121 | | | | 5% Shapiro Wilk Critical Value | | 0.945 | | | | | | | Data Not Lognormal at 5% Significance Level |
| 2122 | | | | Lilliefors Test Statistic | | 0.122 | | | | | | | Lilliefors Lognormal GOF Test |
| 2123 | | | | 5% Lilliefors Critical Value | | 0.131 | | | | | | | Data appear Lognormal at 5% Significance Level |
| 2124 | Data appear Approximate Lognormal at 5% Significance Level | | | | | | | | | | | | |
| 2125 | | | | | | | | | | | | | |
| 2126 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | | |
| 2127 | | | | 95% UTL with 95% Coverage | | 435.9 | | | | | | 90% Percentile (z) | 344.6 |
| 2128 | | | | 95% UPL (t) | | 389.3 | | | | | | 95% Percentile (z) | 383.2 |
| 2129 | | | | 95% USL | | 555.9 | | | | | | 99% Percentile (z) | 467.9 |
| 2130 | | | | | | | | | | | | | |
| 2131 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | | |
| 2132 | Data appear Approximate Lognormal at 5% Significance Level | | | | | | | | | | | | |
| 2133 | | | | | | | | | | | | | |
| 2134 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | | |
| 2135 | | | | Order of Statistic, r | | 44 | | | | | | 95% UTL with 95% Coverage | 447 |
| 2136 | | | | Approx, f used to compute achieved CC | | 1.158 | | | | | | Approximate Actual Confidence Coefficient achieved by UTL | 0.665 |
| 2137 | | | | | | | | | | | | Approximate Sample Size needed to achieve specified CC | 93 |
| 2138 | | | | 95% Percentile Bootstrap UTL with 95% Coverage | | 581.8 | | | | | | 95% BCA Bootstrap UTL with 95% Coverage | 584.6 |
| 2139 | | | | 95% UPL | | 442.8 | | | | | | 90% Percentile | 322.6 |
| 2140 | | | | 90% Chebyshev UPL | | 509.9 | | | | | | 95% Percentile | 422.6 |
| 2141 | | | | 95% Chebyshev UPL | | 628.5 | | | | | | 99% Percentile | 543.3 |
| 2142 | | | | 95% USL | | 619 | | | | | | | |
| 2143 | | | | | | | | | | | | | |
| 2144 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | | |
| 2145 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | | |
| 2146 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | | |
| 2147 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | | |
| 2148 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | | |
| 2149 | | | | | | | | | | | | | |
| 2150 | TOC (TOTAL ORGANIC CARBON) | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---------|---|---|---|---|---|--------|---|
| 2151 | | | | | | | | | | | | |
| 2152 | General Statistics | | | | | | | | | | | |
| 2153 | Total Number of Observations | | | | 45 | | Number of Missing Observations | | | | 1 | |
| 2154 | Number of Distinct Observations | | | | 15 | | | | | | | |
| 2155 | Number of Detects | | | | 14 | | Number of Non-Detects | | | | 31 | |
| 2156 | Number of Distinct Detects | | | | 13 | | Number of Distinct Non-Detects | | | | 2 | |
| 2157 | Minimum Detect | | | | 0.6 | | Minimum Non-Detect | | | | 0.5 | |
| 2158 | Maximum Detect | | | | 2.4 | | Maximum Non-Detect | | | | 1 | |
| 2159 | Variance Detected | | | | 0.244 | | Percent Non-Detects | | | | 68.89% | |
| 2160 | Mean Detected | | | | 1.046 | | SD Detected | | | | 0.494 | |
| 2161 | Mean of Detected Logged Data | | | | -0.0382 | | SD of Detected Logged Data | | | | 0.403 | |
| 2162 | | | | | | | | | | | | |
| 2163 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 2164 | Tolerance Factor K (For UTL) | | | | 2.085 | | d2max (for USL) | | | | 2.915 | |
| 2165 | | | | | | | | | | | | |
| 2166 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 2167 | Shapiro Wilk Test Statistic | | | | 0.819 | | Shapiro Wilk GOF Test | | | | | |
| 2168 | 5% Shapiro Wilk Critical Value | | | | 0.874 | | Data Not Normal at 5% Significance Level | | | | | |
| 2169 | Lilliefors Test Statistic | | | | 0.203 | | Lilliefors GOF Test | | | | | |
| 2170 | 5% Lilliefors Critical Value | | | | 0.226 | | Detected Data appear Normal at 5% Significance Level | | | | | |
| 2171 | Detected Data appear Approximate Normal at 5% Significance Level | | | | | | | | | | | |
| 2172 | | | | | | | | | | | | |
| 2173 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 2174 | KM Mean | | | | 0.743 | | KM SD | | | | 0.352 | |
| 2175 | 95% UTL95% Coverage | | | | 1.477 | | 95% KM UPL (t) | | | | 1.341 | |
| 2176 | 90% KM Percentile (z) | | | | 1.194 | | 95% KM Percentile (z) | | | | 1.322 | |
| 2177 | 99% KM Percentile (z) | | | | 1.562 | | 95% KM USL | | | | 1.769 | |
| 2178 | | | | | | | | | | | | |
| 2179 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 2180 | Mean | | | | 0.636 | | SD | | | | 0.395 | |
| 2181 | 95% UTL95% Coverage | | | | 1.461 | | 95% UPL (t) | | | | 1.308 | |
| 2182 | 90% Percentile (z) | | | | 1.143 | | 95% Percentile (z) | | | | 1.287 | |
| 2183 | 99% Percentile (z) | | | | 1.556 | | 95% USL | | | | 1.789 | |
| 2184 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | |
| 2185 | | | | | | | | | | | | |
| 2186 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | |
| 2187 | A-D Test Statistic | | | | 0.496 | | Anderson-Darling GOF Test | | | | | |
| 2188 | 5% A-D Critical Value | | | | 0.737 | | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 2189 | K-S Test Statistic | | | | 0.182 | | Kolmogorov-Smirnov GOF | | | | | |
| 2190 | 5% K-S Critical Value | | | | 0.229 | | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 2191 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 2192 | | | | | | | | | | | | |
| 2193 | Gamma Statistics on Detected Data Only | | | | | | | | | | | |
| 2194 | k hat (MLE) | | | | 6.194 | | k star (bias corrected MLE) | | | | 4.914 | |
| 2195 | Theta hat (MLE) | | | | 0.169 | | Theta star (bias corrected MLE) | | | | 0.213 | |
| 2196 | nu hat (MLE) | | | | 173.4 | | nu star (bias corrected) | | | | 137.6 | |
| 2197 | MLE Mean (bias corrected) | | | | 1.046 | | | | | | | |
| 2198 | MLE Sd (bias corrected) | | | | 0.472 | | 95% Percentile of Chisquare (2kstar) | | | | 18.07 | |
| 2199 | | | | | | | | | | | | |
| 2200 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | | | | |
|------|---|---|---|---|-------|---|---|---|-----------------------|---|--------|---|-------|--|-------|--|
| 2201 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | | | | | |
| 2202 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | | | | | |
| 2203 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | | | | | |
| 2204 | This is especially true when the sample size is small. | | | | | | | | | | | | | | | |
| 2205 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | | | | | |
| 2206 | Minimum | | | | 0.01 | | Mean | | | | 0.603 | | | | | |
| 2207 | Maximum | | | | 2.4 | | Median | | | | 0.6 | | | | | |
| 2208 | SD | | | | 0.485 | | CV | | | | 0.804 | | | | | |
| 2209 | k hat (MLE) | | | | 0.986 | | k star (bias corrected MLE) | | | | 0.935 | | | | | |
| 2210 | Theta hat (MLE) | | | | 0.611 | | Theta star (bias corrected MLE) | | | | 0.645 | | | | | |
| 2211 | nu hat (MLE) | | | | 88.76 | | nu star (bias corrected) | | | | 84.18 | | | | | |
| 2212 | MLE Mean (bias corrected) | | | | 0.603 | | MLE Sd (bias corrected) | | | | 0.624 | | | | | |
| 2213 | 95% Percentile of Chisquare (2kstar) | | | | 5.738 | | 90% Percentile | | | | 1.412 | | | | | |
| 2214 | 95% Percentile | | | | 1.85 | | 99% Percentile | | | | 2.873 | | | | | |
| 2215 | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | | | | | | | | |
| 2216 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | | | | |
| 2217 | | | | | WH | | HW | | | | | | WH | | HW | |
| 2218 | 95% Approx. Gamma UTL with 95% Coverage | | | | 2.392 | | 2.773 | | 95% Approx. Gamma UPL | | | | 1.865 | | 2.077 | |
| 2219 | 95% Gamma USL | | | | 3.84 | | 4.849 | | | | | | | | | |
| 2220 | | | | | | | | | | | | | | | | |
| 2221 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | | | | | |
| 2222 | Mean (KM) | | | | 0.743 | | SD (KM) | | | | 0.352 | | | | | |
| 2223 | Variance (KM) | | | | 0.124 | | SE of Mean (KM) | | | | 0.0604 | | | | | |
| 2224 | k hat (KM) | | | | 4.451 | | k star (KM) | | | | 4.169 | | | | | |
| 2225 | nu hat (KM) | | | | 400.6 | | nu star (KM) | | | | 375.2 | | | | | |
| 2226 | theta hat (KM) | | | | 0.167 | | theta star (KM) | | | | 0.178 | | | | | |
| 2227 | 80% gamma percentile (KM) | | | | 1.019 | | 90% gamma percentile (KM) | | | | 1.23 | | | | | |
| 2228 | 95% gamma percentile (KM) | | | | 1.424 | | 99% gamma percentile (KM) | | | | 1.838 | | | | | |
| 2229 | | | | | | | | | | | | | | | | |
| 2230 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | | | | | |
| 2231 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | | | | |
| 2232 | | | | | WH | | HW | | | | | | WH | | HW | |
| 2233 | 95% Approx. Gamma UTL with 95% Coverage | | | | 1.442 | | 1.441 | | 95% Approx. Gamma UPL | | | | 1.278 | | 1.273 | |
| 2234 | 95% KM Gamma Percentile | | | | 1.256 | | 1.251 | | 95% Gamma USL | | | | 1.839 | | 1.859 | |
| 2235 | | | | | | | | | | | | | | | | |
| 2236 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | | | | | |
| 2237 | Shapiro Wilk Test Statistic | | | | 0.928 | | Shapiro Wilk GOF Test | | | | | | | | | |
| 2238 | 5% Shapiro Wilk Critical Value | | | | 0.874 | | Detected Data appear Lognormal at 5% Significance Level | | | | | | | | | |
| 2239 | Lilliefors Test Statistic | | | | 0.159 | | Lilliefors GOF Test | | | | | | | | | |
| 2240 | 5% Lilliefors Critical Value | | | | 0.226 | | Detected Data appear Lognormal at 5% Significance Level | | | | | | | | | |
| 2241 | Detected Data appear Lognormal at 5% Significance Level | | | | | | | | | | | | | | | |
| 2242 | | | | | | | | | | | | | | | | |
| 2243 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | | | | | |
| 2244 | Mean in Original Scale | | | | 0.694 | | Mean in Log Scale | | | | -0.497 | | | | | |
| 2245 | SD in Original Scale | | | | 0.402 | | SD in Log Scale | | | | 0.511 | | | | | |
| 2246 | 95% UTL95% Coverage | | | | 1.764 | | 95% BCA UTL95% Coverage | | | | 2.2 | | | | | |
| 2247 | 95% Bootstrap (%) UTL95% Coverage | | | | 2.24 | | 95% UPL (t) | | | | 1.448 | | | | | |
| 2248 | 90% Percentile (z) | | | | 1.17 | | 95% Percentile (z) | | | | 1.409 | | | | | |
| 2249 | 99% Percentile (z) | | | | 1.996 | | 95% USL | | | | 2.696 | | | | | |
| 2250 | | | | | | | | | | | | | | | | |

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|------|--|---|---|---|--------|---|---|---|---|---|--------|---|
| 2251 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | |
| 2252 | KM Mean of Logged Data | | | | -0.372 | | 95% KM UTL (Lognormal)95% Coverage | | | | 1.447 | |
| 2253 | KM SD of Logged Data | | | | 0.356 | | 95% KM UPL (Lognormal) | | | | 1.261 | |
| 2254 | 95% KM Percentile Lognormal (z) | | | | 1.237 | | 95% KM USL (Lognormal) | | | | 1.943 | |
| 2255 | | | | | | | | | | | | |
| 2256 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 2257 | Mean in Original Scale | | | | 0.636 | | Mean in Log Scale | | | | -0.582 | |
| 2258 | SD in Original Scale | | | | 0.395 | | SD in Log Scale | | | | 0.487 | |
| 2259 | 95% UTL95% Coverage | | | | 1.544 | | 95% UPL (t) | | | | 1.279 | |
| 2260 | 90% Percentile (z) | | | | 1.043 | | 95% Percentile (z) | | | | 1.246 | |
| 2261 | 99% Percentile (z) | | | | 1.736 | | 95% USL | | | | 2.313 | |
| 2262 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 2263 | | | | | | | | | | | | |
| 2264 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 2265 | Data appear to follow a Discernible Distribution at 5% Significance Level | | | | | | | | | | | |
| 2266 | | | | | | | | | | | | |
| 2267 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 2268 | Order of Statistic, r | | | | 44 | | 95% UTL with95% Coverage | | | | 1.6 | |
| 2269 | Approx, f used to compute achieved CC | | | | 1.158 | | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.665 | |
| 2270 | Approximate Sample Size needed to achieve specified CC | | | | 93 | | 95% UPL | | | | 1.54 | |
| 2271 | 95% USL | | | | 2.4 | | 95% KM Chebyshev UPL | | | | 2.294 | |
| 2272 | | | | | | | | | | | | |
| 2273 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 2274 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 2275 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 2276 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 2277 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 2278 | | | | | | | | | | | | |
| 2279 | TOTAL PHENOLICS | | | | | | | | | | | |
| 2280 | | | | | | | | | | | | |
| 2281 | General Statistics | | | | | | | | | | | |
| 2282 | Total Number of Observations | | | | 46 | | Number of Missing Observations | | | | 0 | |
| 2283 | Number of Distinct Observations | | | | 2 | | | | | | | |
| 2284 | Number of Detects | | | | 2 | | Number of Non-Detects | | | | 44 | |
| 2285 | Number of Distinct Detects | | | | 1 | | Number of Distinct Non-Detects | | | | 2 | |
| 2286 | Minimum Detect | | | | 0.01 | | Minimum Non-Detect | | | | 0.005 | |
| 2287 | Maximum Detect | | | | 0.01 | | Maximum Non-Detect | | | | 0.01 | |
| 2288 | Variance Detected | | | | 0 | | Percent Non-Detects | | | | 95.65% | |
| 2289 | Mean Detected | | | | 0.01 | | SD Detected | | | | 0 | |
| 2290 | Mean of Detected Logged Data | | | | -4.605 | | SD of Detected Logged Data | | | | 0 | |
| 2291 | | | | | | | | | | | | |
| 2292 | Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! | | | | | | | | | | | |
| 2293 | It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2294 | | | | | | | | | | | | |
| 2295 | The data set for variable TOTAL PHENOLICS was not processed! | | | | | | | | | | | |
| 2296 | | | | | | | | | | | | |
| 2297 | | | | | | | | | | | | |
| 2298 | TURBIDITY | | | | | | | | | | | |
| 2299 | | | | | | | | | | | | |
| 2300 | General Statistics | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|--------|---|---|---|---|---|--------|
| 2301 | Total Number of Observations | | | | | 46 | Number of Missing Observations | | | | | 0 |
| 2302 | Number of Distinct Observations | | | | | 29 | | | | | | |
| 2303 | Number of Detects | | | | | 38 | Number of Non-Detects | | | | | 8 |
| 2304 | Number of Distinct Detects | | | | | 28 | Number of Distinct Non-Detects | | | | | 1 |
| 2305 | Minimum Detect | | | | | 0.11 | Minimum Non-Detect | | | | | 0.1 |
| 2306 | Maximum Detect | | | | | 10.1 | Maximum Non-Detect | | | | | 0.1 |
| 2307 | Variance Detected | | | | | 3.355 | Percent Non-Detects | | | | | 17.39% |
| 2308 | Mean Detected | | | | | 0.807 | SD Detected | | | | | 1.832 |
| 2309 | Mean of Detected Logged Data | | | | | -1.066 | SD of Detected Logged Data | | | | | 1.051 |
| 2310 | | | | | | | | | | | | |
| 2311 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 2312 | Tolerance Factor K (For UTL) | | | | | 2.079 | d2max (for USL) | | | | | 2.924 |
| 2313 | | | | | | | | | | | | |
| 2314 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 2315 | Shapiro Wilk Test Statistic | | | | | 0.401 | Shapiro Wilk GOF Test | | | | | |
| 2316 | 5% Shapiro Wilk Critical Value | | | | | 0.938 | Data Not Normal at 5% Significance Level | | | | | |
| 2317 | Lilliefors Test Statistic | | | | | 0.4 | Lilliefors GOF Test | | | | | |
| 2318 | 5% Lilliefors Critical Value | | | | | 0.142 | Data Not Normal at 5% Significance Level | | | | | |
| 2319 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 2320 | | | | | | | | | | | | |
| 2321 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 2322 | KM Mean | | | | | 0.684 | KM SD | | | | | 1.664 |
| 2323 | 95% UTL95% Coverage | | | | | 4.145 | 95% KM UPL (t) | | | | | 3.51 |
| 2324 | 90% KM Percentile (z) | | | | | 2.817 | 95% KM Percentile (z) | | | | | 3.422 |
| 2325 | 99% KM Percentile (z) | | | | | 4.556 | 95% KM USL | | | | | 5.551 |
| 2326 | | | | | | | | | | | | |
| 2327 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 2328 | Mean | | | | | 0.676 | SD | | | | | 1.686 |
| 2329 | 95% UTL95% Coverage | | | | | 4.181 | 95% UPL (t) | | | | | 3.538 |
| 2330 | 90% Percentile (z) | | | | | 2.836 | 95% Percentile (z) | | | | | 3.449 |
| 2331 | 99% Percentile (z) | | | | | 4.598 | 95% USL | | | | | 5.606 |
| 2332 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | |
| 2333 | | | | | | | | | | | | |
| 2334 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | |
| 2335 | A-D Test Statistic | | | | | 4.315 | Anderson-Darling GOF Test | | | | | |
| 2336 | 5% A-D Critical Value | | | | | 0.793 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2337 | K-S Test Statistic | | | | | 0.273 | Kolmogorov-Smirnov GOF | | | | | |
| 2338 | 5% K-S Critical Value | | | | | 0.149 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2339 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 2340 | | | | | | | | | | | | |
| 2341 | Gamma Statistics on Detected Data Only | | | | | | | | | | | |
| 2342 | k hat (MLE) | | | | | 0.708 | k star (bias corrected MLE) | | | | | 0.67 |
| 2343 | Theta hat (MLE) | | | | | 1.14 | Theta star (bias corrected MLE) | | | | | 1.206 |
| 2344 | nu hat (MLE) | | | | | 53.82 | nu star (bias corrected) | | | | | 50.9 |
| 2345 | MLE Mean (bias corrected) | | | | | 0.807 | | | | | | |
| 2346 | MLE Sd (bias corrected) | | | | | 0.987 | 95% Percentile of Chisquare (2kstar) | | | | | 4.632 |
| 2347 | | | | | | | | | | | | |
| 2348 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | |
| 2349 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 2350 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|--------------------------------------|--------|-------|---|---|---|-----------------------|---|---|--------|---|
| 2351 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | |
| 2352 | This is especially true when the sample size is small. | | | | | | | | | | | |
| 2353 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 2354 | | Minimum | 0.01 | | | | | | | Mean | 0.669 | |
| 2355 | | Maximum | 10.1 | | | | | | | Median | 0.225 | |
| 2356 | | SD | 1.689 | | | | | | | CV | 2.525 | |
| 2357 | | k hat (MLE) | 0.497 | | | | | | | k star (bias corrected MLE) | 0.479 | |
| 2358 | | Theta hat (MLE) | 1.345 | | | | | | | Theta star (bias corrected MLE) | 1.396 | |
| 2359 | | nu hat (MLE) | 45.73 | | | | | | | nu star (bias corrected) | 44.08 | |
| 2360 | | MLE Mean (bias corrected) | 0.669 | | | | | | | MLE Sd (bias corrected) | 0.966 | |
| 2361 | | 95% Percentile of Chisquare (2kstar) | 3.737 | | | | | | | 90% Percentile | 1.825 | |
| 2362 | | 95% Percentile | 2.608 | | | | | | | 99% Percentile | 4.541 | |
| 2363 | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | | | | |
| 2364 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | |
| 2365 | | | WH | HW | | | | | | WH | HW | |
| 2366 | 95% Approx. Gamma UTL with 95% Coverage | | 3.051 | 3.156 | | | | 95% Approx. Gamma UPL | | 2.223 | 2.208 | |
| 2367 | | 95% Gamma USL | 5.561 | 6.31 | | | | | | | | |
| 2368 | | | | | | | | | | | | |
| 2369 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | |
| 2370 | | Mean (KM) | 0.684 | | | | | | | SD (KM) | 1.664 | |
| 2371 | | Variance (KM) | 2.77 | | | | | | | SE of Mean (KM) | 0.249 | |
| 2372 | | k hat (KM) | 0.169 | | | | | | | k star (KM) | 0.173 | |
| 2373 | | nu hat (KM) | 15.55 | | | | | | | nu star (KM) | 15.87 | |
| 2374 | | theta hat (KM) | 4.048 | | | | | | | theta star (KM) | 3.967 | |
| 2375 | | 80% gamma percentile (KM) | 0.826 | | | | | | | 90% gamma percentile (KM) | 2.059 | |
| 2376 | | 95% gamma percentile (KM) | 3.656 | | | | | | | 99% gamma percentile (KM) | 8.169 | |
| 2377 | | | | | | | | | | | | |
| 2378 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | |
| 2379 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | |
| 2380 | | | WH | HW | | | | | | WH | HW | |
| 2381 | 95% Approx. Gamma UTL with 95% Coverage | | 2.736 | 2.622 | | | | 95% Approx. Gamma UPL | | 2.052 | 1.923 | |
| 2382 | | 95% KM Gamma Percentile | 1.968 | 1.838 | | | | 95% Gamma USL | | 4.754 | 4.831 | |
| 2383 | | | | | | | | | | | | |
| 2384 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | |
| 2385 | | Shapiro Wilk Test Statistic | 0.852 | | | | | | | Shapiro Wilk GOF Test | | |
| 2386 | | 5% Shapiro Wilk Critical Value | 0.938 | | | | | | | Data Not Lognormal at 5% Significance Level | | |
| 2387 | | Lilliefors Test Statistic | 0.144 | | | | | | | Lilliefors GOF Test | | |
| 2388 | | 5% Lilliefors Critical Value | 0.142 | | | | | | | Data Not Lognormal at 5% Significance Level | | |
| 2389 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 2390 | | | | | | | | | | | | |
| 2391 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | |
| 2392 | | Mean in Original Scale | 0.673 | | | | | | | Mean in Log Scale | -1.473 | |
| 2393 | | SD in Original Scale | 1.687 | | | | | | | SD in Log Scale | 1.323 | |
| 2394 | | 95% UTL95% Coverage | 3.585 | | | | | | | 95% BCA UTL95% Coverage | 5.48 | |
| 2395 | | 95% Bootstrap (%) UTL95% Coverage | 8.945 | | | | | | | 95% UPL (t) | 2.164 | |
| 2396 | | 90% Percentile (z) | 1.248 | | | | | | | 95% Percentile (z) | 2.018 | |
| 2397 | | 99% Percentile (z) | 4.97 | | | | | | | 95% USL | 10.96 | |
| 2398 | | | | | | | | | | | | |
| 2399 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | |
| 2400 | | KM Mean of Logged Data | -1.281 | | | | | | | 95% KM UTL (Lognormal)95% Coverage | 2.479 | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 2401 | KM SD of Logged Data | | | | | 1.053 | 95% KM UPL (Lognormal) | | | | | 1.658 |
| 2402 | 95% KM Percentile Lognormal (z) | | | | | 1.569 | 95% KM USL (Lognormal) | | | | | 6.031 |
| 2403 | | | | | | | | | | | | |
| 2404 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 2405 | Mean in Original Scale | | | | | 0.676 | Mean in Log Scale | | | | | -1.402 |
| 2406 | SD in Original Scale | | | | | 1.686 | SD in Log Scale | | | | | 1.206 |
| 2407 | 95% UTL95% Coverage | | | | | 3.024 | 95% UPL (t) | | | | | 1.908 |
| 2408 | 90% Percentile (z) | | | | | 1.155 | 95% Percentile (z) | | | | | 1.79 |
| 2409 | 99% Percentile (z) | | | | | 4.073 | 95% USL | | | | | 8.377 |
| 2410 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 2411 | | | | | | | | | | | | |
| 2412 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 2413 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 2414 | | | | | | | | | | | | |
| 2415 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 2416 | Order of Statistic, r | | | | | 45 | 95% UTL with95% Coverage | | | | | 5.48 |
| 2417 | Approx, f used to compute achieved CC | | | | | 1.184 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.677 |
| 2418 | Approximate Sample Size needed to achieve specified CC | | | | | 93 | 95% UPL | | | | | 4.707 |
| 2419 | 95% USL | | | | | 10.1 | 95% KM Chebyshev UPL | | | | | 8.018 |
| 2420 | | | | | | | | | | | | |
| 2421 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 2422 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 2423 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 2424 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 2425 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 2426 | | | | | | | | | | | | |
| 2427 | BENZENE | | | | | | | | | | | |
| 2428 | | | | | | | | | | | | |
| 2429 | General Statistics | | | | | | | | | | | |
| 2430 | Total Number of Observations | | | | | 46 | Number of Missing Observations | | | | | 0 |
| 2431 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 2432 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 46 |
| 2433 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 2434 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 2435 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 2436 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 2437 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 2438 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 2439 | | | | | | | | | | | | |
| 2440 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2441 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2442 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2443 | | | | | | | | | | | | |
| 2444 | The data set for variable BENZENE was not processed! | | | | | | | | | | | |
| 2445 | | | | | | | | | | | | |
| 2446 | | | | | | | | | | | | |
| 2447 | 1,2-DIBROMOETHANE | | | | | | | | | | | |
| 2448 | | | | | | | | | | | | |
| 2449 | General Statistics | | | | | | | | | | | |
| 2450 | Total Number of Observations | | | | | 46 | Number of Missing Observations | | | | | 0 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|-----|--------------------------------|---|---|---|---|------|
| 2451 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 2452 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 46 |
| 2453 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 2454 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 2455 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 2456 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 2457 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 2458 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 2459 | | | | | | | | | | | | |
| 2460 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2461 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2462 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2463 | | | | | | | | | | | | |
| 2464 | The data set for variable 1,2-DIBROMOETHANE was not processed! | | | | | | | | | | | |
| 2465 | | | | | | | | | | | | |
| 2466 | | | | | | | | | | | | |
| 2467 | 1,1-DICHLOROETHANE | | | | | | | | | | | |
| 2468 | | | | | | | | | | | | |
| 2469 | General Statistics | | | | | | | | | | | |
| 2470 | Total Number of Observations | | | | | 46 | Number of Missing Observations | | | | | 0 |
| 2471 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 2472 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 46 |
| 2473 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 2474 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 2475 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 2476 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 2477 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 2478 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 2479 | | | | | | | | | | | | |
| 2480 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2481 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2482 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2483 | | | | | | | | | | | | |
| 2484 | The data set for variable 1,1-DICHLOROETHANE was not processed! | | | | | | | | | | | |
| 2485 | | | | | | | | | | | | |
| 2486 | | | | | | | | | | | | |
| 2487 | 1,1-DICHLOROETHENE | | | | | | | | | | | |
| 2488 | | | | | | | | | | | | |
| 2489 | General Statistics | | | | | | | | | | | |
| 2490 | Total Number of Observations | | | | | 46 | Number of Missing Observations | | | | | 0 |
| 2491 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 2492 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 46 |
| 2493 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 2494 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 2495 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 2496 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 2497 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 2498 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 2499 | | | | | | | | | | | | |
| 2500 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|-----|---|--------------------------------|---|---|---|------|---|
| 2501 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2502 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2503 | | | | | | | | | | | | |
| 2504 | The data set for variable 1,1-DICHLOROETHENE was not processed! | | | | | | | | | | | |
| 2505 | | | | | | | | | | | | |
| 2506 | | | | | | | | | | | | |
| 2507 | 1,2-DICHLOROETHANE | | | | | | | | | | | |
| 2508 | | | | | | | | | | | | |
| 2509 | General Statistics | | | | | | | | | | | |
| 2510 | Total Number of Observations | | | | 46 | | Number of Missing Observations | | | | 0 | |
| 2511 | Number of Distinct Observations | | | | 1 | | | | | | | |
| 2512 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 46 | |
| 2513 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 1 | |
| 2514 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 1 | |
| 2515 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 1 | |
| 2516 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 2517 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 2518 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 2519 | | | | | | | | | | | | |
| 2520 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2521 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2522 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2523 | | | | | | | | | | | | |
| 2524 | The data set for variable 1,2-DICHLOROETHANE was not processed! | | | | | | | | | | | |
| 2525 | | | | | | | | | | | | |
| 2526 | | | | | | | | | | | | |
| 2527 | cis 1,2-DICHLOROETHENE | | | | | | | | | | | |
| 2528 | | | | | | | | | | | | |
| 2529 | General Statistics | | | | | | | | | | | |
| 2530 | Total Number of Observations | | | | 46 | | Number of Missing Observations | | | | 0 | |
| 2531 | Number of Distinct Observations | | | | 1 | | | | | | | |
| 2532 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 46 | |
| 2533 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 1 | |
| 2534 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 1 | |
| 2535 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 1 | |
| 2536 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 2537 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 2538 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 2539 | | | | | | | | | | | | |
| 2540 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2541 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2542 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2543 | | | | | | | | | | | | |
| 2544 | The data set for variable cis 1,2-DICHLOROETHENE was not processed! | | | | | | | | | | | |
| 2545 | | | | | | | | | | | | |
| 2546 | | | | | | | | | | | | |
| 2547 | trans 1,2-DICHLOROETHENE | | | | | | | | | | | |
| 2548 | | | | | | | | | | | | |
| 2549 | General Statistics | | | | | | | | | | | |
| 2550 | Total Number of Observations | | | | 46 | | Number of Missing Observations | | | | 0 | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|-----|--------------------------------|---|---|---|---|------|
| 2551 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 2552 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 46 |
| 2553 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 2554 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 2555 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 2556 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 2557 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 2558 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 2559 | | | | | | | | | | | | |
| 2560 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2561 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2562 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2563 | | | | | | | | | | | | |
| 2564 | The data set for variable trans 1,2-DICHLOROETHENE was not processed! | | | | | | | | | | | |
| 2565 | | | | | | | | | | | | |
| 2566 | | | | | | | | | | | | |
| 2567 | ETHYLBENZENE | | | | | | | | | | | |
| 2568 | | | | | | | | | | | | |
| 2569 | General Statistics | | | | | | | | | | | |
| 2570 | Total Number of Observations | | | | | 46 | Number of Missing Observations | | | | | 0 |
| 2571 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 2572 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 46 |
| 2573 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 2574 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 2575 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 2576 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 2577 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 2578 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 2579 | | | | | | | | | | | | |
| 2580 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2581 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2582 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2583 | | | | | | | | | | | | |
| 2584 | The data set for variable ETHYLBENZENE was not processed! | | | | | | | | | | | |
| 2585 | | | | | | | | | | | | |
| 2586 | | | | | | | | | | | | |
| 2587 | METHYLENE CHLORIDE | | | | | | | | | | | |
| 2588 | | | | | | | | | | | | |
| 2589 | General Statistics | | | | | | | | | | | |
| 2590 | Total Number of Observations | | | | | 46 | Number of Missing Observations | | | | | 0 |
| 2591 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 2592 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 46 |
| 2593 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 2594 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 2595 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 2596 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 2597 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 2598 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 2599 | | | | | | | | | | | | |
| 2600 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|-----|---|--------------------------------|---|---|---|------|---|
| 2601 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2602 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2603 | | | | | | | | | | | | |
| 2604 | The data set for variable METHYLENE CHLORIDE was not processed! | | | | | | | | | | | |
| 2605 | | | | | | | | | | | | |
| 2606 | | | | | | | | | | | | |
| 2607 | TETRACHLOROETHENE | | | | | | | | | | | |
| 2608 | | | | | | | | | | | | |
| 2609 | General Statistics | | | | | | | | | | | |
| 2610 | Total Number of Observations | | | | 46 | | Number of Missing Observations | | | | 0 | |
| 2611 | Number of Distinct Observations | | | | 1 | | | | | | | |
| 2612 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 46 | |
| 2613 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 1 | |
| 2614 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 1 | |
| 2615 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 1 | |
| 2616 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 2617 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 2618 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 2619 | | | | | | | | | | | | |
| 2620 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2621 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2622 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2623 | | | | | | | | | | | | |
| 2624 | The data set for variable TETRACHLOROETHENE was not processed! | | | | | | | | | | | |
| 2625 | | | | | | | | | | | | |
| 2626 | | | | | | | | | | | | |
| 2627 | TOLUENE | | | | | | | | | | | |
| 2628 | | | | | | | | | | | | |
| 2629 | General Statistics | | | | | | | | | | | |
| 2630 | Total Number of Observations | | | | 45 | | Number of Missing Observations | | | | 1 | |
| 2631 | Number of Distinct Observations | | | | 1 | | | | | | | |
| 2632 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 45 | |
| 2633 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 1 | |
| 2634 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 1 | |
| 2635 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 1 | |
| 2636 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 2637 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 2638 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 2639 | | | | | | | | | | | | |
| 2640 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2641 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2642 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2643 | | | | | | | | | | | | |
| 2644 | The data set for variable TOLUENE was not processed! | | | | | | | | | | | |
| 2645 | | | | | | | | | | | | |
| 2646 | | | | | | | | | | | | |
| 2647 | 1,1,1-TRICHLOROETHANE | | | | | | | | | | | |
| 2648 | | | | | | | | | | | | |
| 2649 | General Statistics | | | | | | | | | | | |
| 2650 | Total Number of Observations | | | | 46 | | Number of Missing Observations | | | | 0 | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|-----|--------------------------------|---|---|---|---|------|
| 2651 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 2652 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 46 |
| 2653 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 2654 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 2655 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 2656 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 2657 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 2658 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 2659 | | | | | | | | | | | | |
| 2660 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2661 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2662 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2663 | | | | | | | | | | | | |
| 2664 | The data set for variable 1,1,1-TRICHLOROETHANE was not processed! | | | | | | | | | | | |
| 2665 | | | | | | | | | | | | |
| 2666 | | | | | | | | | | | | |
| 2667 | TRICHLOROETHENE | | | | | | | | | | | |
| 2668 | | | | | | | | | | | | |
| 2669 | General Statistics | | | | | | | | | | | |
| 2670 | Total Number of Observations | | | | | 46 | Number of Missing Observations | | | | | 0 |
| 2671 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 2672 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 46 |
| 2673 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 2674 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 2675 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 2676 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 2677 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 2678 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 2679 | | | | | | | | | | | | |
| 2680 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2681 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2682 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2683 | | | | | | | | | | | | |
| 2684 | The data set for variable TRICHLOROETHENE was not processed! | | | | | | | | | | | |
| 2685 | | | | | | | | | | | | |
| 2686 | | | | | | | | | | | | |
| 2687 | VINYL CHLORIDE | | | | | | | | | | | |
| 2688 | | | | | | | | | | | | |
| 2689 | General Statistics | | | | | | | | | | | |
| 2690 | Total Number of Observations | | | | | 46 | Number of Missing Observations | | | | | 0 |
| 2691 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 2692 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 46 |
| 2693 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 2694 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 2695 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 2696 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 2697 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 2698 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 2699 | | | | | | | | | | | | |
| 2700 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|-----|---|--------------------------------|---|---|---|-------|---|
| 2701 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2702 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2703 | | | | | | | | | | | | |
| 2704 | The data set for variable VINYL CHLORIDE was not processed! | | | | | | | | | | | |
| 2705 | | | | | | | | | | | | |
| 2706 | | | | | | | | | | | | |
| 2707 | XYLENES (TOTAL) | | | | | | | | | | | |
| 2708 | | | | | | | | | | | | |
| 2709 | General Statistics | | | | | | | | | | | |
| 2710 | Total Number of Observations | | | | 46 | | Number of Missing Observations | | | | 0 | |
| 2711 | Number of Distinct Observations | | | | 1 | | | | | | | |
| 2712 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 46 | |
| 2713 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 1 | |
| 2714 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 3 | |
| 2715 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 3 | |
| 2716 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 2717 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 2718 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 2719 | | | | | | | | | | | | |
| 2720 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2721 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2722 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2723 | | | | | | | | | | | | |
| 2724 | The data set for variable XYLENES (TOTAL) was not processed! | | | | | | | | | | | |
| 2725 | | | | | | | | | | | | |
| 2726 | | | | | | | | | | | | |
| 2727 | ARSENIC, TOTAL | | | | | | | | | | | |
| 2728 | | | | | | | | | | | | |
| 2729 | General Statistics | | | | | | | | | | | |
| 2730 | Total Number of Observations | | | | 12 | | Number of Missing Observations | | | | 34 | |
| 2731 | Number of Distinct Observations | | | | 3 | | | | | | | |
| 2732 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 12 | |
| 2733 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 3 | |
| 2734 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 0.003 | |
| 2735 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 0.009 | |
| 2736 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 2737 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 2738 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 2739 | | | | | | | | | | | | |
| 2740 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2741 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2742 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2743 | | | | | | | | | | | | |
| 2744 | The data set for variable ARSENIC, TOTAL was not processed! | | | | | | | | | | | |
| 2745 | | | | | | | | | | | | |
| 2746 | | | | | | | | | | | | |
| 2747 | ARSENIC, DISSOLVED | | | | | | | | | | | |
| 2748 | | | | | | | | | | | | |
| 2749 | General Statistics | | | | | | | | | | | |
| 2750 | Total Number of Observations | | | | 12 | | Number of Missing Observations | | | | 34 | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|--------|---|---|---|---|---|--------|
| 2751 | Number of Distinct Observations | | | | | 2 | | | | | | |
| 2752 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 12 |
| 2753 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 2 |
| 2754 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 0.003 |
| 2755 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 0.008 |
| 2756 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 2757 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 2758 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 2759 | | | | | | | | | | | | |
| 2760 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2761 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2762 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2763 | | | | | | | | | | | | |
| 2764 | The data set for variable ARSENIC, DISSOLVED was not processed! | | | | | | | | | | | |
| 2765 | | | | | | | | | | | | |
| 2766 | | | | | | | | | | | | |
| 2767 | BARIUM, TOTAL | | | | | | | | | | | |
| 2768 | | | | | | | | | | | | |
| 2769 | General Statistics | | | | | | | | | | | |
| 2770 | Total Number of Observations | | | | | 12 | Number of Distinct Observations | | | | | 5 |
| 2771 | | | | | | | Number of Missing Observations | | | | | 34 |
| 2772 | Minimum | | | | | 0.02 | First Quartile | | | | | 0.05 |
| 2773 | Second Largest | | | | | 0.07 | Median | | | | | 0.06 |
| 2774 | Maximum | | | | | 0.08 | Third Quartile | | | | | 0.07 |
| 2775 | Mean | | | | | 0.0592 | SD | | | | | 0.0156 |
| 2776 | Coefficient of Variation | | | | | 0.264 | Skewness | | | | | -1.376 |
| 2777 | Mean of logged Data | | | | | -2.875 | SD of logged Data | | | | | 0.362 |
| 2778 | | | | | | | | | | | | |
| 2779 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 2780 | Tolerance Factor K (For UTL) | | | | | 2.736 | d2max (for USL) | | | | | 2.285 |
| 2781 | | | | | | | | | | | | |
| 2782 | Normal GOF Test | | | | | | | | | | | |
| 2783 | Shapiro Wilk Test Statistic | | | | | 0.866 | Shapiro Wilk GOF Test | | | | | |
| 2784 | 5% Shapiro Wilk Critical Value | | | | | 0.859 | Data appear Normal at 5% Significance Level | | | | | |
| 2785 | Lilliefors Test Statistic | | | | | 0.196 | Lilliefors GOF Test | | | | | |
| 2786 | 5% Lilliefors Critical Value | | | | | 0.243 | Data appear Normal at 5% Significance Level | | | | | |
| 2787 | Data appear Normal at 5% Significance Level | | | | | | | | | | | |
| 2788 | | | | | | | | | | | | |
| 2789 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 2790 | 95% UTL with 95% Coverage | | | | | 0.102 | 90% Percentile (z) | | | | | 0.0792 |
| 2791 | 95% UPL (t) | | | | | 0.0884 | 95% Percentile (z) | | | | | 0.0849 |
| 2792 | 95% USL | | | | | 0.0949 | 99% Percentile (z) | | | | | 0.0956 |
| 2793 | | | | | | | | | | | | |
| 2794 | Gamma GOF Test | | | | | | | | | | | |
| 2795 | A-D Test Statistic | | | | | 1.017 | Anderson-Darling Gamma GOF Test | | | | | |
| 2796 | 5% A-D Critical Value | | | | | 0.73 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2797 | K-S Test Statistic | | | | | 0.25 | Kolmogorov-Smirnov Gamma GOF Test | | | | | |
| 2798 | 5% K-S Critical Value | | | | | 0.245 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2799 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 2800 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|---------|---|---|---|---|---|---------|---|
| 2801 | Gamma Statistics | | | | | | | | | | | |
| 2802 | k hat (MLE) | | | | 10.63 | | k star (bias corrected MLE) | | | | 8.026 | |
| 2803 | Theta hat (MLE) | | | | 0.00557 | | Theta star (bias corrected MLE) | | | | 0.00737 | |
| 2804 | nu hat (MLE) | | | | 255 | | nu star (bias corrected) | | | | 192.6 | |
| 2805 | MLE Mean (bias corrected) | | | | 0.0592 | | MLE Sd (bias corrected) | | | | 0.0209 | |
| 2806 | | | | | | | | | | | | |
| 2807 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 2808 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | | 0.0995 | | 90% Percentile | | | | 0.087 | |
| 2809 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | 0.102 | | 95% Percentile | | | | 0.0972 | |
| 2810 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | 0.124 | | 99% Percentile | | | | 0.118 | |
| 2811 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | 0.13 | | | | | | | |
| 2812 | 95% WH USL | | | | 0.111 | | 95% HW USL | | | | 0.114 | |
| 2813 | | | | | | | | | | | | |
| 2814 | Lognormal GOF Test | | | | | | | | | | | |
| 2815 | Shapiro Wilk Test Statistic | | | | 0.72 | | Shapiro Wilk Lognormal GOF Test | | | | | |
| 2816 | 5% Shapiro Wilk Critical Value | | | | 0.859 | | Data Not Lognormal at 5% Significance Level | | | | | |
| 2817 | Lilliefors Test Statistic | | | | 0.286 | | Lilliefors Lognormal GOF Test | | | | | |
| 2818 | 5% Lilliefors Critical Value | | | | 0.243 | | Data Not Lognormal at 5% Significance Level | | | | | |
| 2819 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 2820 | | | | | | | | | | | | |
| 2821 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 2822 | 95% UTL with 95% Coverage | | | | 0.152 | | 90% Percentile (z) | | | | 0.0897 | |
| 2823 | 95% UPL (t) | | | | 0.111 | | 95% Percentile (z) | | | | 0.102 | |
| 2824 | 95% USL | | | | 0.129 | | 99% Percentile (z) | | | | 0.131 | |
| 2825 | | | | | | | | | | | | |
| 2826 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 2827 | Data appear Normal at 5% Significance Level | | | | | | | | | | | |
| 2828 | | | | | | | | | | | | |
| 2829 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 2830 | Order of Statistic, r | | | | 12 | | 95% UTL with 95% Coverage | | | | 0.08 | |
| 2831 | Approx, f used to compute achieved CC | | | | 0.632 | | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.46 | |
| 2832 | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | 59 | |
| 2833 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | 0.08 | | 95% BCA Bootstrap UTL with 95% Coverage | | | | 0.08 | |
| 2834 | 95% UPL | | | | 0.08 | | 90% Percentile | | | | 0.07 | |
| 2835 | 90% Chebyshev UPL | | | | 0.108 | | 95% Percentile | | | | 0.0745 | |
| 2836 | 95% Chebyshev UPL | | | | 0.13 | | 99% Percentile | | | | 0.0789 | |
| 2837 | 95% USL | | | | 0.08 | | | | | | | |
| 2838 | | | | | | | | | | | | |
| 2839 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 2840 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 2841 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 2842 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 2843 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 2844 | | | | | | | | | | | | |
| 2845 | BARIUM, DISSOLVED | | | | | | | | | | | |
| 2846 | | | | | | | | | | | | |
| 2847 | General Statistics | | | | | | | | | | | |
| 2848 | Total Number of Observations | | | | 12 | | Number of Distinct Observations | | | | 6 | |
| 2849 | | | | | | | Number of Missing Observations | | | | 34 | |
| 2850 | Minimum | | | | 0.02 | | First Quartile | | | | 0.05 | |

| | | | | | | | | | | | | |
|------|---|---|---|---|---|---------|---|---|---|---|---|---------|
| | A | B | C | D | E | F | G | H | I | J | K | L |
| 2851 | Second Largest | | | | | 0.07 | Median | | | | | 0.06 |
| 2852 | Maximum | | | | | 0.08 | Third Quartile | | | | | 0.07 |
| 2853 | Mean | | | | | 0.0575 | SD | | | | | 0.016 |
| 2854 | Coefficient of Variation | | | | | 0.279 | Skewness | | | | | -1.103 |
| 2855 | Mean of logged Data | | | | | -2.907 | SD of logged Data | | | | | 0.368 |
| 2856 | | | | | | | | | | | | |
| 2857 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 2858 | Tolerance Factor K (For UTL) | | | | | 2.736 | d2max (for USL) | | | | | 2.285 |
| 2859 | | | | | | | | | | | | |
| 2860 | Normal GOF Test | | | | | | | | | | | |
| 2861 | Shapiro Wilk Test Statistic | | | | | 0.91 | Shapiro Wilk GOF Test | | | | | |
| 2862 | 5% Shapiro Wilk Critical Value | | | | | 0.859 | Data appear Normal at 5% Significance Level | | | | | |
| 2863 | Lilliefors Test Statistic | | | | | 0.229 | Lilliefors GOF Test | | | | | |
| 2864 | 5% Lilliefors Critical Value | | | | | 0.243 | Data appear Normal at 5% Significance Level | | | | | |
| 2865 | Data appear Normal at 5% Significance Level | | | | | | | | | | | |
| 2866 | | | | | | | | | | | | |
| 2867 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 2868 | 95% UTL with 95% Coverage | | | | | 0.101 | 90% Percentile (z) | | | | | 0.078 |
| 2869 | 95% UPL (t) | | | | | 0.0875 | 95% Percentile (z) | | | | | 0.0839 |
| 2870 | 95% USL | | | | | 0.0941 | 99% Percentile (z) | | | | | 0.0948 |
| 2871 | | | | | | | | | | | | |
| 2872 | Gamma GOF Test | | | | | | | | | | | |
| 2873 | A-D Test Statistic | | | | | 0.819 | Anderson-Darling Gamma GOF Test | | | | | |
| 2874 | 5% A-D Critical Value | | | | | 0.73 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2875 | K-S Test Statistic | | | | | 0.262 | Kolmogorov-Smirnov Gamma GOF Test | | | | | |
| 2876 | 5% K-S Critical Value | | | | | 0.245 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2877 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 2878 | | | | | | | | | | | | |
| 2879 | Gamma Statistics | | | | | | | | | | | |
| 2880 | k hat (MLE) | | | | | 10.03 | k star (bias corrected MLE) | | | | | 7.581 |
| 2881 | Theta hat (MLE) | | | | | 0.00573 | Theta star (bias corrected MLE) | | | | | 0.00758 |
| 2882 | nu hat (MLE) | | | | | 240.8 | nu star (bias corrected) | | | | | 182 |
| 2883 | MLE Mean (bias corrected) | | | | | 0.0575 | MLE Sd (bias corrected) | | | | | 0.0209 |
| 2884 | | | | | | | | | | | | |
| 2885 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 2886 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | | | 0.098 | 90% Percentile | | | | | 0.0854 |
| 2887 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | | 0.1 | 95% Percentile | | | | | 0.0956 |
| 2888 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | | 0.123 | 99% Percentile | | | | | 0.117 |
| 2889 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | | 0.128 | | | | | | |
| 2890 | 95% WH USL | | | | | 0.11 | 95% HW USL | | | | | 0.113 |
| 2891 | | | | | | | | | | | | |
| 2892 | Lognormal GOF Test | | | | | | | | | | | |
| 2893 | Shapiro Wilk Test Statistic | | | | | 0.78 | Shapiro Wilk Lognormal GOF Test | | | | | |
| 2894 | 5% Shapiro Wilk Critical Value | | | | | 0.859 | Data Not Lognormal at 5% Significance Level | | | | | |
| 2895 | Lilliefors Test Statistic | | | | | 0.267 | Lilliefors Lognormal GOF Test | | | | | |
| 2896 | 5% Lilliefors Critical Value | | | | | 0.243 | Data Not Lognormal at 5% Significance Level | | | | | |
| 2897 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 2898 | | | | | | | | | | | | |
| 2899 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 2900 | 95% UTL with 95% Coverage | | | | | 0.149 | 90% Percentile (z) | | | | | 0.0876 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|--|-------|---|---|---|---|---|--------|
| 2901 | | | | | 95% UPL (t) | 0.109 | | | | 95% Percentile (z) | | 0.1 |
| 2902 | | | | | 95% USL | 0.127 | | | | 99% Percentile (z) | | 0.129 |
| 2903 | | | | | | | | | | | | |
| 2904 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 2905 | Data appear Normal at 5% Significance Level | | | | | | | | | | | |
| 2906 | | | | | | | | | | | | |
| 2907 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 2908 | | | | | Order of Statistic, r | 12 | | | | 95% UTL with 95% Coverage | | 0.08 |
| 2909 | | | | | Approx, f used to compute achieved CC | 0.632 | | | | Approximate Actual Confidence Coefficient achieved by UTL | | 0.46 |
| 2910 | | | | | | | | | | Approximate Sample Size needed to achieve specified CC | | 59 |
| 2911 | | | | | 95% Percentile Bootstrap UTL with 95% Coverage | 0.08 | | | | 95% BCA Bootstrap UTL with 95% Coverage | | 0.08 |
| 2912 | | | | | 95% UPL | 0.08 | | | | 90% Percentile | | 0.07 |
| 2913 | | | | | 90% Chebyshev UPL | 0.108 | | | | 95% Percentile | | 0.0745 |
| 2914 | | | | | 95% Chebyshev UPL | 0.13 | | | | 99% Percentile | | 0.0789 |
| 2915 | | | | | 95% USL | 0.08 | | | | | | |
| 2916 | | | | | | | | | | | | |
| 2917 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 2918 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 2919 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 2920 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 2921 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 2922 | | | | | | | | | | | | |
| 2923 | CADMIUM, TOTAL | | | | | | | | | | | |
| 2924 | | | | | | | | | | | | |
| 2925 | General Statistics | | | | | | | | | | | |
| 2926 | | | | | Total Number of Observations | 12 | | | | Number of Missing Observations | | 34 |
| 2927 | | | | | Number of Distinct Observations | 3 | | | | | | |
| 2928 | | | | | Number of Detects | 0 | | | | Number of Non-Detects | | 12 |
| 2929 | | | | | Number of Distinct Detects | 0 | | | | Number of Distinct Non-Detects | | 3 |
| 2930 | | | | | Minimum Detect | N/A | | | | Minimum Non-Detect | | 0.0011 |
| 2931 | | | | | Maximum Detect | N/A | | | | Maximum Non-Detect | | 0.0022 |
| 2932 | | | | | Variance Detected | N/A | | | | Percent Non-Detects | | 100% |
| 2933 | | | | | Mean Detected | N/A | | | | SD Detected | | N/A |
| 2934 | | | | | Mean of Detected Logged Data | N/A | | | | SD of Detected Logged Data | | N/A |
| 2935 | | | | | | | | | | | | |
| 2936 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 2937 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 2938 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 2939 | | | | | | | | | | | | |
| 2940 | The data set for variable CADMIUM, TOTAL was not processed! | | | | | | | | | | | |
| 2941 | | | | | | | | | | | | |
| 2942 | | | | | | | | | | | | |
| 2943 | CADMIUM, DISSOLVED | | | | | | | | | | | |
| 2944 | | | | | | | | | | | | |
| 2945 | General Statistics | | | | | | | | | | | |
| 2946 | | | | | Total Number of Observations | 12 | | | | Number of Missing Observations | | 34 |
| 2947 | | | | | Number of Distinct Observations | 2 | | | | | | |
| 2948 | | | | | Number of Detects | 0 | | | | Number of Non-Detects | | 12 |
| 2949 | | | | | Number of Distinct Detects | 0 | | | | Number of Distinct Non-Detects | | 2 |
| 2950 | | | | | Minimum Detect | N/A | | | | Minimum Non-Detect | | 0.0011 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|-----------|---|---|---|--------------------------------|---|-----------|
| 2951 | | | | Maximum Detect | | N/A | | | | Maximum Non-Detect | | 0.002 |
| 2952 | | | | Variance Detected | | N/A | | | | Percent Non-Detects | | 100% |
| 2953 | | | | Mean Detected | | N/A | | | | SD Detected | | N/A |
| 2954 | | | | Mean of Detected Logged Data | | N/A | | | | SD of Detected Logged Data | | N/A |
| 2955 | | | | | | | | | | | | |
| 2956 | | | | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | |
| 2957 | | | | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | |
| 2958 | | | | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | |
| 2959 | | | | | | | | | | | | |
| 2960 | | | | The data set for variable CADMIUM, DISSOLVED was not processed! | | | | | | | | |
| 2961 | | | | | | | | | | | | |
| 2962 | | | | | | | | | | | | |
| 2963 | | | | CHROMIUM, TOTAL | | | | | | | | |
| 2964 | | | | | | | | | | | | |
| 2965 | | | | General Statistics | | | | | | | | |
| 2966 | | | | Total Number of Observations | | 12 | | | | Number of Missing Observations | | 34 |
| 2967 | | | | Number of Distinct Observations | | 5 | | | | | | |
| 2968 | | | | Number of Detects | | 2 | | | | Number of Non-Detects | | 10 |
| 2969 | | | | Number of Distinct Detects | | 2 | | | | Number of Distinct Non-Detects | | 3 |
| 2970 | | | | Minimum Detect | | 0.0066 | | | | Minimum Non-Detect | | 0.0022 |
| 2971 | | | | Maximum Detect | | 0.0076 | | | | Maximum Non-Detect | | 0.006 |
| 2972 | | | | Variance Detected | | 5.0000E-7 | | | | Percent Non-Detects | | 83.33% |
| 2973 | | | | Mean Detected | | 0.0071 | | | | SD Detected | | 7.0711E-4 |
| 2974 | | | | Mean of Detected Logged Data | | -4.95 | | | | SD of Detected Logged Data | | 0.0998 |
| 2975 | | | | | | | | | | | | |
| 2976 | | | | Warning: Data set has only 2 Detected Values. | | | | | | | | |
| 2977 | | | | This is not enough to compute meaningful or reliable statistics and estimates. | | | | | | | | |
| 2978 | | | | | | | | | | | | |
| 2979 | | | | | | | | | | | | |
| 2980 | | | | Critical Values for Background Threshold Values (BTVs) | | | | | | | | |
| 2981 | | | | Tolerance Factor K (For UTL) | | 2.736 | | | | d2max (for USL) | | 2.285 |
| 2982 | | | | | | | | | | | | |
| 2983 | | | | Normal GOF Test on Detects Only | | | | | | | | |
| 2984 | | | | Not Enough Data to Perform GOF Test | | | | | | | | |
| 2985 | | | | | | | | | | | | |
| 2986 | | | | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | |
| 2987 | | | | KM Mean | | 0.00302 | | | | KM SD | | 0.00184 |
| 2988 | | | | 95% UTL95% Coverage | | 0.00804 | | | | 95% KM UPL (t) | | 0.00645 |
| 2989 | | | | 90% KM Percentile (z) | | 0.00537 | | | | 95% KM Percentile (z) | | 0.00604 |
| 2990 | | | | 99% KM Percentile (z) | | 0.00729 | | | | 95% KM USL | | 0.00722 |
| 2991 | | | | | | | | | | | | |
| 2992 | | | | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | |
| 2993 | | | | Mean | | 0.00298 | | | | SD | | 0.0021 |
| 2994 | | | | 95% UTL95% Coverage | | 0.00874 | | | | 95% UPL (t) | | 0.00692 |
| 2995 | | | | 90% Percentile (z) | | 0.00568 | | | | 95% Percentile (z) | | 0.00644 |
| 2996 | | | | 99% Percentile (z) | | 0.00788 | | | | 95% USL | | 0.00779 |
| 2997 | | | | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | |
| 2998 | | | | | | | | | | | | |
| 2999 | | | | Gamma GOF Tests on Detected Observations Only | | | | | | | | |
| 3000 | | | | Not Enough Data to Perform GOF Test | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | |
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| 3001 | | | | | | | | | | | | | |
| 3002 | Gamma Statistics on Detected Data Only | | | | | | | | | | | | |
| 3003 | | | | | k hat (MLE) | 201.3 | | | | | k star (bias corrected MLE) | N/A | |
| 3004 | | | | | Theta hat (MLE) | 3.5270E-5 | | | | | Theta star (bias corrected MLE) | N/A | |
| 3005 | | | | | nu hat (MLE) | 805.2 | | | | | nu star (bias corrected) | N/A | |
| 3006 | | | | | MLE Mean (bias corrected) | N/A | | | | | | | |
| 3007 | | | | | MLE Sd (bias corrected) | N/A | | | | | 95% Percentile of Chisquare (2kstar) | N/A | |
| 3008 | | | | | | | | | | | | | |
| 3009 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | | |
| 3010 | | | | | Mean (KM) | 0.00302 | | | | | SD (KM) | 0.00184 | |
| 3011 | | | | | Variance (KM) | 3.3764E-6 | | | | | SE of Mean (KM) | 7.5015E-4 | |
| 3012 | | | | | k hat (KM) | 2.695 | | | | | k star (KM) | 2.077 | |
| 3013 | | | | | nu hat (KM) | 64.69 | | | | | nu star (KM) | 49.85 | |
| 3014 | | | | | theta hat (KM) | 0.00112 | | | | | theta star (KM) | 0.00145 | |
| 3015 | | | | | 80% gamma percentile (KM) | 0.0045 | | | | | 90% gamma percentile (KM) | 0.00582 | |
| 3016 | | | | | 95% gamma percentile (KM) | 0.00707 | | | | | 99% gamma percentile (KM) | 0.00985 | |
| 3017 | | | | | | | | | | | | | |
| 3018 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | | |
| 3019 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | |
| 3020 | | | | | | WH | HW | | | | | WH | HW |
| 3021 | 95% Approx. Gamma UTL with 95% Coverage | | | | | 0.00847 | 0.00855 | 95% Approx. Gamma UPL | | | | 0.0062 | 0.00617 |
| 3022 | 95% KM Gamma Percentile | | | | | 0.00569 | 0.00564 | 95% Gamma USL | | | | 0.00723 | 0.00724 |
| 3023 | | | | | | | | | | | | | |
| 3024 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | | |
| 3025 | Not Enough Data to Perform GOF Test | | | | | | | | | | | | |
| 3026 | | | | | | | | | | | | | |
| 3027 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | | |
| 3028 | | | | | Mean in Original Scale | 0.0044 | | | | | Mean in Log Scale | -5.469 | |
| 3029 | | | | | SD in Original Scale | 0.00144 | | | | | SD in Log Scale | 0.302 | |
| 3030 | | | | | 95% UTL95% Coverage | 0.00963 | | | | | 95% BCA UTL95% Coverage | 0.0076 | |
| 3031 | | | | | 95% Bootstrap (%) UTL95% Coverage | 0.0076 | | | | | 95% UPL (t) | 0.00741 | |
| 3032 | | | | | 90% Percentile (z) | 0.0062 | | | | | 95% Percentile (z) | 0.00692 | |
| 3033 | | | | | 99% Percentile (z) | 0.00851 | | | | | 95% USL | 0.0084 | |
| 3034 | | | | | | | | | | | | | |
| 3035 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | | |
| 3036 | | | | | KM Mean of Logged Data | -5.924 | | | | | 95% KM UTL (Lognormal)95% Coverage | 0.00883 | |
| 3037 | | | | | KM SD of Logged Data | 0.437 | | | | | 95% KM UPL (Lognormal) | 0.00605 | |
| 3038 | | | | | 95% KM Percentile Lognormal (z) | 0.00548 | | | | | 95% KM USL (Lognormal) | 0.00725 | |
| 3039 | | | | | | | | | | | | | |
| 3040 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | | |
| 3041 | | | | | Mean in Original Scale | 0.00298 | | | | | Mean in Log Scale | -6.023 | |
| 3042 | | | | | SD in Original Scale | 0.0021 | | | | | SD in Log Scale | 0.673 | |
| 3043 | | | | | 95% UTL95% Coverage | 0.0153 | | | | | 95% UPL (t) | 0.00852 | |
| 3044 | | | | | 90% Percentile (z) | 0.00574 | | | | | 95% Percentile (z) | 0.00732 | |
| 3045 | | | | | 99% Percentile (z) | 0.0116 | | | | | 95% USL | 0.0113 | |
| 3046 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | | |
| 3047 | | | | | | | | | | | | | |
| 3048 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | | |
| 3049 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | | |
| 3050 | | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|-----------|---|---|---|---|---|---------|---|
| 3051 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 3052 | Order of Statistic, r | | | | 12 | 95% UTL with 95% Coverage | | | | | 0.0076 | |
| 3053 | Approx, f used to compute achieved CC | | | | 0.632 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.46 | |
| 3054 | Approximate Sample Size needed to achieve specified CC | | | | 59 | 95% UPL | | | | | 0.0076 | |
| 3055 | 95% USL | | | | 0.0076 | 95% KM Chebyshev UPL | | | | | 0.0114 | |
| 3056 | | | | | | | | | | | | |
| 3057 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 3058 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 3059 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 3060 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 3061 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 3062 | | | | | | | | | | | | |
| 3063 | CHROMIUM, DISSOLVED | | | | | | | | | | | |
| 3064 | | | | | | | | | | | | |
| 3065 | General Statistics | | | | | | | | | | | |
| 3066 | Total Number of Observations | | | | 12 | Number of Missing Observations | | | | | 34 | |
| 3067 | Number of Distinct Observations | | | | 4 | | | | | | | |
| 3068 | Number of Detects | | | | 1 | Number of Non-Detects | | | | | 11 | |
| 3069 | Number of Distinct Detects | | | | 1 | Number of Distinct Non-Detects | | | | | 3 | |
| 3070 | Minimum Detect | | | | 0.0061 | Minimum Non-Detect | | | | | 0.0022 | |
| 3071 | Maximum Detect | | | | 0.0061 | Maximum Non-Detect | | | | | 0.006 | |
| 3072 | Variance Detected | | | | N/A | Percent Non-Detects | | | | | 91.67% | |
| 3073 | Mean Detected | | | | 0.0061 | SD Detected | | | | | N/A | |
| 3074 | Mean of Detected Logged Data | | | | -5.099 | SD of Detected Logged Data | | | | | N/A | |
| 3075 | | | | | | | | | | | | |
| 3076 | Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! | | | | | | | | | | | |
| 3077 | It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 3078 | | | | | | | | | | | | |
| 3079 | The data set for variable CHROMIUM, DISSOLVED was not processed! | | | | | | | | | | | |
| 3080 | | | | | | | | | | | | |
| 3081 | | | | | | | | | | | | |
| 3082 | COPPER, TOTAL | | | | | | | | | | | |
| 3083 | | | | | | | | | | | | |
| 3084 | General Statistics | | | | | | | | | | | |
| 3085 | Total Number of Observations | | | | 12 | Number of Missing Observations | | | | | 34 | |
| 3086 | Number of Distinct Observations | | | | 3 | | | | | | | |
| 3087 | Number of Detects | | | | 10 | Number of Non-Detects | | | | | 2 | |
| 3088 | Number of Distinct Detects | | | | 3 | Number of Distinct Non-Detects | | | | | 1 | |
| 3089 | Minimum Detect | | | | 0.01 | Minimum Non-Detect | | | | | 0.01 | |
| 3090 | Maximum Detect | | | | 0.03 | Maximum Non-Detect | | | | | 0.01 | |
| 3091 | Variance Detected | | | | 5.0000E-5 | Percent Non-Detects | | | | | 16.67% | |
| 3092 | Mean Detected | | | | 0.015 | SD Detected | | | | | 0.00707 | |
| 3093 | Mean of Detected Logged Data | | | | -4.287 | SD of Detected Logged Data | | | | | 0.427 | |
| 3094 | | | | | | | | | | | | |
| 3095 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 3096 | Tolerance Factor K (For UTL) | | | | 2.736 | d2max (for USL) | | | | | 2.285 | |
| 3097 | | | | | | | | | | | | |
| 3098 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 3099 | Shapiro Wilk Test Statistic | | | | 0.731 | Shapiro Wilk GOF Test | | | | | | |
| 3100 | 5% Shapiro Wilk Critical Value | | | | 0.842 | Data Not Normal at 5% Significance Level | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | |
|------|---|---|---|---|---------|---|--|---|---|---------|--------|--------|--|
| 3101 | Lilliefors Test Statistic | | | | | 0.36 | Lilliefors GOF Test | | | | | | |
| 3102 | 5% Lilliefors Critical Value | | | | | 0.262 | Data Not Normal at 5% Significance Level | | | | | | |
| 3103 | Data Not Normal at 5% Significance Level | | | | | | | | | | | | |
| 3104 | | | | | | | | | | | | | |
| 3105 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | | |
| 3106 | KM Mean | | | | 0.0142 | KM SD | | | | 0.0064 | | | |
| 3107 | 95% UTL95% Coverage | | | | 0.0317 | 95% KM UPL (t) | | | | 0.0261 | | | |
| 3108 | 90% KM Percentile (z) | | | | 0.0224 | 95% KM Percentile (z) | | | | 0.0247 | | | |
| 3109 | 99% KM Percentile (z) | | | | 0.0291 | 95% KM USL | | | | 0.0288 | | | |
| 3110 | | | | | | | | | | | | | |
| 3111 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | | |
| 3112 | Mean | | | | 0.0133 | SD | | | | 0.00749 | | | |
| 3113 | 95% UTL95% Coverage | | | | 0.0338 | 95% UPL (t) | | | | 0.0273 | | | |
| 3114 | 90% Percentile (z) | | | | 0.0229 | 95% Percentile (z) | | | | 0.0256 | | | |
| 3115 | 99% Percentile (z) | | | | 0.0308 | 95% USL | | | | 0.0304 | | | |
| 3116 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | | |
| 3117 | | | | | | | | | | | | | |
| 3118 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | | |
| 3119 | A-D Test Statistic | | | | 1.405 | Anderson-Darling GOF Test | | | | | | | |
| 3120 | 5% A-D Critical Value | | | | 0.729 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | |
| 3121 | K-S Test Statistic | | | | 0.382 | Kolmogorov-Smirnov GOF | | | | | | | |
| 3122 | 5% K-S Critical Value | | | | 0.267 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | |
| 3123 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | | |
| 3124 | | | | | | | | | | | | | |
| 3125 | Gamma Statistics on Detected Data Only | | | | | | | | | | | | |
| 3126 | k hat (MLE) | | | | 5.865 | k star (bias corrected MLE) | | | | 4.173 | | | |
| 3127 | Theta hat (MLE) | | | | 0.00256 | Theta star (bias corrected MLE) | | | | 0.00359 | | | |
| 3128 | nu hat (MLE) | | | | 117.3 | nu star (bias corrected) | | | | 83.45 | | | |
| 3129 | MLE Mean (bias corrected) | | | | 0.015 | | | | | | | | |
| 3130 | MLE Sd (bias corrected) | | | | 0.00734 | 95% Percentile of Chisquare (2kstar) | | | | 16 | | | |
| 3131 | | | | | | | | | | | | | |
| 3132 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | | |
| 3133 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | | |
| 3134 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | | |
| 3135 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | | |
| 3136 | This is especially true when the sample size is small. | | | | | | | | | | | | |
| 3137 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | | |
| 3138 | Minimum | | | | 0.01 | Mean | | | | 0.0142 | | | |
| 3139 | Maximum | | | | 0.03 | Median | | | | 0.01 | | | |
| 3140 | SD | | | | 0.00669 | CV | | | | 0.472 | | | |
| 3141 | k hat (MLE) | | | | 6.152 | k star (bias corrected MLE) | | | | 4.67 | | | |
| 3142 | Theta hat (MLE) | | | | 0.0023 | Theta star (bias corrected MLE) | | | | 0.00303 | | | |
| 3143 | nu hat (MLE) | | | | 147.7 | nu star (bias corrected) | | | | 112.1 | | | |
| 3144 | MLE Mean (bias corrected) | | | | 0.0142 | MLE Sd (bias corrected) | | | | 0.00656 | | | |
| 3145 | 95% Percentile of Chisquare (2kstar) | | | | 17.39 | 90% Percentile | | | | 0.0229 | | | |
| 3146 | 95% Percentile | | | | 0.0264 | 99% Percentile | | | | 0.0337 | | | |
| 3147 | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | | | | | |
| 3148 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | |
| 3149 | | | | | WH | HW | | | | | WH | HW | |
| 3150 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.0361 | 0.0368 | 95% Approx. Gamma UPL | | | | 0.0272 | 0.0274 | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 3151 | 95% Gamma USL | | | | 0.0313 | 0.0316 | | | | | | |
| 3152 | | | | | | | | | | | | |
| 3153 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | |
| 3154 | Mean (KM) | | | | 0.0142 | SD (KM) | | | | 0.0064 | | |
| 3155 | Variance (KM) | | | | 4.0972E-5 | SE of Mean (KM) | | | | 0.00195 | | |
| 3156 | k hat (KM) | | | | 4.898 | k star (KM) | | | | 3.729 | | |
| 3157 | nu hat (KM) | | | | 117.6 | nu star (KM) | | | | 89.5 | | |
| 3158 | theta hat (KM) | | | | 0.00289 | theta star (KM) | | | | 0.0038 | | |
| 3159 | 80% gamma percentile (KM) | | | | 0.0197 | 90% gamma percentile (KM) | | | | 0.024 | | |
| 3160 | 95% gamma percentile (KM) | | | | 0.028 | 99% gamma percentile (KM) | | | | 0.0365 | | |
| 3161 | | | | | | | | | | | | |
| 3162 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | |
| 3163 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | |
| 3164 | | | | | WH | HW | | | | | WH | HW |
| 3165 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.0348 | 0.0354 | 95% Approx. Gamma UPL | | | | 0.0265 | 0.0266 |
| 3166 | 95% KM Gamma Percentile | | | | 0.0246 | 0.0246 | 95% Gamma USL | | | | 0.0303 | 0.0306 |
| 3167 | | | | | | | | | | | | |
| 3168 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | |
| 3169 | Shapiro Wilk Test Statistic | | | | 0.728 | Shapiro Wilk GOF Test | | | | | | |
| 3170 | 5% Shapiro Wilk Critical Value | | | | 0.842 | Data Not Lognormal at 5% Significance Level | | | | | | |
| 3171 | Lilliefors Test Statistic | | | | 0.372 | Lilliefors GOF Test | | | | | | |
| 3172 | 5% Lilliefors Critical Value | | | | 0.262 | Data Not Lognormal at 5% Significance Level | | | | | | |
| 3173 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 3174 | | | | | | | | | | | | |
| 3175 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | |
| 3176 | Mean in Original Scale | | | | 0.0134 | Mean in Log Scale | | | | -4.444 | | |
| 3177 | SD in Original Scale | | | | 0.00741 | SD in Log Scale | | | | 0.533 | | |
| 3178 | 95% UTL95% Coverage | | | | 0.0505 | 95% BCA UTL95% Coverage | | | | 0.03 | | |
| 3179 | 95% Bootstrap (%) UTL95% Coverage | | | | 0.03 | 95% UPL (t) | | | | 0.0318 | | |
| 3180 | 90% Percentile (z) | | | | 0.0233 | 95% Percentile (z) | | | | 0.0282 | | |
| 3181 | 99% Percentile (z) | | | | 0.0406 | 95% USL | | | | 0.0397 | | |
| 3182 | | | | | | | | | | | | |
| 3183 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | |
| 3184 | KM Mean of Logged Data | | | | -4.34 | 95% KM UTL (Lognormal)95% Coverage | | | | 0.0377 | | |
| 3185 | KM SD of Logged Data | | | | 0.388 | 95% KM UPL (Lognormal) | | | | 0.0269 | | |
| 3186 | 95% KM Percentile Lognormal (z) | | | | 0.0247 | 95% KM USL (Lognormal) | | | | 0.0316 | | |
| 3187 | | | | | | | | | | | | |
| 3188 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 3189 | Mean in Original Scale | | | | 0.0133 | Mean in Log Scale | | | | -4.456 | | |
| 3190 | SD in Original Scale | | | | 0.00749 | SD in Log Scale | | | | 0.551 | | |
| 3191 | 95% UTL95% Coverage | | | | 0.0525 | 95% UPL (t) | | | | 0.0325 | | |
| 3192 | 90% Percentile (z) | | | | 0.0235 | 95% Percentile (z) | | | | 0.0287 | | |
| 3193 | 99% Percentile (z) | | | | 0.0419 | 95% USL | | | | 0.0409 | | |
| 3194 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 3195 | | | | | | | | | | | | |
| 3196 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 3197 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 3198 | | | | | | | | | | | | |
| 3199 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 3200 | Order of Statistic, r | | | | 12 | 95% UTL with95% Coverage | | | | 0.03 | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|---|-----------|---|---|---|---|---|---------|
| 3201 | Approx, f used to compute achieved CC | | | | | 0.632 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.46 |
| 3202 | Approximate Sample Size needed to achieve specified CC | | | | | 59 | 95% UPL | | | | | 0.03 |
| 3203 | 95% USL | | | | | 0.03 | 95% KM Chebyshev UPL | | | | | 0.0432 |
| 3204 | | | | | | | | | | | | |
| 3205 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 3206 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 3207 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 3208 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 3209 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 3210 | | | | | | | | | | | | |
| 3211 | COPPER, DISSOLVED | | | | | | | | | | | |
| 3212 | | | | | | | | | | | | |
| 3213 | General Statistics | | | | | | | | | | | |
| 3214 | Total Number of Observations | | | | | 12 | Number of Missing Observations | | | | | 34 |
| 3215 | Number of Distinct Observations | | | | | 3 | | | | | | |
| 3216 | Number of Detects | | | | | 11 | Number of Non-Detects | | | | | 1 |
| 3217 | Number of Distinct Detects | | | | | 3 | Number of Distinct Non-Detects | | | | | 1 |
| 3218 | Minimum Detect | | | | | 0.01 | Minimum Non-Detect | | | | | 0.01 |
| 3219 | Maximum Detect | | | | | 0.03 | Maximum Non-Detect | | | | | 0.01 |
| 3220 | Variance Detected | | | | | 4.7273E-5 | Percent Non-Detects | | | | | 8.333% |
| 3221 | Mean Detected | | | | | 0.0155 | SD Detected | | | | | 0.00688 |
| 3222 | Mean of Detected Logged Data | | | | | -4.253 | SD of Detected Logged Data | | | | | 0.42 |
| 3223 | | | | | | | | | | | | |
| 3224 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 3225 | Tolerance Factor K (For UTL) | | | | | 2.736 | d2max (for USL) | | | | | 2.285 |
| 3226 | | | | | | | | | | | | |
| 3227 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 3228 | Shapiro Wilk Test Statistic | | | | | 0.756 | Shapiro Wilk GOF Test | | | | | |
| 3229 | 5% Shapiro Wilk Critical Value | | | | | 0.85 | Data Not Normal at 5% Significance Level | | | | | |
| 3230 | Lilliefors Test Statistic | | | | | 0.332 | Lilliefors GOF Test | | | | | |
| 3231 | 5% Lilliefors Critical Value | | | | | 0.251 | Data Not Normal at 5% Significance Level | | | | | |
| 3232 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 3233 | | | | | | | | | | | | |
| 3234 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 3235 | KM Mean | | | | | 0.015 | KM SD | | | | | 0.00645 |
| 3236 | 95% UTL95% Coverage | | | | | 0.0327 | 95% KM UPL (t) | | | | | 0.0271 |
| 3237 | 90% KM Percentile (z) | | | | | 0.0233 | 95% KM Percentile (z) | | | | | 0.0256 |
| 3238 | 99% KM Percentile (z) | | | | | 0.03 | 95% KM USL | | | | | 0.0297 |
| 3239 | | | | | | | | | | | | |
| 3240 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 3241 | Mean | | | | | 0.0146 | SD | | | | | 0.00722 |
| 3242 | 95% UTL95% Coverage | | | | | 0.0343 | 95% UPL (t) | | | | | 0.0281 |
| 3243 | 90% Percentile (z) | | | | | 0.0238 | 95% Percentile (z) | | | | | 0.0265 |
| 3244 | 99% Percentile (z) | | | | | 0.0314 | 95% USL | | | | | 0.0311 |
| 3245 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | |
| 3246 | | | | | | | | | | | | |
| 3247 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | |
| 3248 | A-D Test Statistic | | | | | 1.414 | Anderson-Darling GOF Test | | | | | |
| 3249 | 5% A-D Critical Value | | | | | 0.731 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3250 | K-S Test Statistic | | | | | 0.353 | Kolmogorov-Smirnov GOF | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | |
|------|---|---|---|---|-----------|---|-----------------------|---|---|---------|--------|--------|--|
| 3251 | 5% K-S Critical Value | | | | 0.256 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | |
| 3252 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | | |
| 3253 | | | | | | | | | | | | | |
| 3254 | Gamma Statistics on Detected Data Only | | | | | | | | | | | | |
| 3255 | k hat (MLE) | | | | 6.158 | k star (bias corrected MLE) | | | | 4.539 | | | |
| 3256 | Theta hat (MLE) | | | | 0.00251 | Theta star (bias corrected MLE) | | | | 0.0034 | | | |
| 3257 | nu hat (MLE) | | | | 135.5 | nu star (bias corrected) | | | | 99.86 | | | |
| 3258 | MLE Mean (bias corrected) | | | | 0.0155 | | | | | | | | |
| 3259 | MLE Sd (bias corrected) | | | | 0.00725 | 95% Percentile of Chisquare (2kstar) | | | | 17.03 | | | |
| 3260 | | | | | | | | | | | | | |
| 3261 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | | |
| 3262 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | | |
| 3263 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | | |
| 3264 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | | |
| 3265 | This is especially true when the sample size is small. | | | | | | | | | | | | |
| 3266 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | | |
| 3267 | Minimum | | | | 0.01 | Mean | | | | 0.015 | | | |
| 3268 | Maximum | | | | 0.03 | Median | | | | 0.01 | | | |
| 3269 | SD | | | | 0.00674 | CV | | | | 0.449 | | | |
| 3270 | k hat (MLE) | | | | 6.196 | k star (bias corrected MLE) | | | | 4.702 | | | |
| 3271 | Theta hat (MLE) | | | | 0.00242 | Theta star (bias corrected MLE) | | | | 0.00319 | | | |
| 3272 | nu hat (MLE) | | | | 148.7 | nu star (bias corrected) | | | | 112.9 | | | |
| 3273 | MLE Mean (bias corrected) | | | | 0.015 | MLE Sd (bias corrected) | | | | 0.00692 | | | |
| 3274 | 95% Percentile of Chisquare (2kstar) | | | | 17.48 | 90% Percentile | | | | 0.0243 | | | |
| 3275 | 95% Percentile | | | | 0.0279 | 99% Percentile | | | | 0.0356 | | | |
| 3276 | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | | | | | |
| 3277 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | |
| 3278 | | | | | WH | HW | | | | | WH | HW | |
| 3279 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.0381 | 0.0391 | 95% Approx. Gamma UPL | | | | 0.0288 | 0.0291 | |
| 3280 | 95% Gamma USL | | | | 0.0331 | 0.0336 | | | | | | | |
| 3281 | | | | | | | | | | | | | |
| 3282 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | | |
| 3283 | Mean (KM) | | | | 0.015 | SD (KM) | | | | 0.00645 | | | |
| 3284 | Variance (KM) | | | | 4.1667E-5 | SE of Mean (KM) | | | | 0.00195 | | | |
| 3285 | k hat (KM) | | | | 5.4 | k star (KM) | | | | 4.106 | | | |
| 3286 | nu hat (KM) | | | | 129.6 | nu star (KM) | | | | 98.53 | | | |
| 3287 | theta hat (KM) | | | | 0.00278 | theta star (KM) | | | | 0.00365 | | | |
| 3288 | 80% gamma percentile (KM) | | | | 0.0206 | 90% gamma percentile (KM) | | | | 0.0249 | | | |
| 3289 | 95% gamma percentile (KM) | | | | 0.0289 | 99% gamma percentile (KM) | | | | 0.0373 | | | |
| 3290 | | | | | | | | | | | | | |
| 3291 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | | |
| 3292 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | |
| 3293 | | | | | WH | HW | | | | | WH | HW | |
| 3294 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.0368 | 0.0376 | 95% Approx. Gamma UPL | | | | 0.0281 | 0.0282 | |
| 3295 | 95% KM Gamma Percentile | | | | 0.0261 | 0.0261 | 95% Gamma USL | | | | 0.032 | 0.0325 | |
| 3296 | | | | | | | | | | | | | |
| 3297 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | | |
| 3298 | Shapiro Wilk Test Statistic | | | | 0.747 | Shapiro Wilk GOF Test | | | | | | | |
| 3299 | 5% Shapiro Wilk Critical Value | | | | 0.85 | Data Not Lognormal at 5% Significance Level | | | | | | | |
| 3300 | Lilliefors Test Statistic | | | | 0.344 | Lilliefors GOF Test | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 3301 | 5% Lilliefors Critical Value | | | | | 0.251 | Data Not Lognormal at 5% Significance Level | | | | | |
| 3302 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 3303 | | | | | | | | | | | | |
| 3304 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | |
| 3305 | Mean in Original Scale | | | | | 0.0146 | Mean in Log Scale | | | | | -4.331 |
| 3306 | SD in Original Scale | | | | | 0.00715 | SD in Log Scale | | | | | 0.483 |
| 3307 | 95% UTL95% Coverage | | | | | 0.0494 | 95% BCA UTL95% Coverage | | | | | 0.03 |
| 3308 | 95% Bootstrap (%) UTL95% Coverage | | | | | 0.03 | 95% UPL (t) | | | | | 0.0325 |
| 3309 | 90% Percentile (z) | | | | | 0.0244 | 95% Percentile (z) | | | | | 0.0291 |
| 3310 | 99% Percentile (z) | | | | | 0.0405 | 95% USL | | | | | 0.0397 |
| 3311 | | | | | | | | | | | | |
| 3312 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | |
| 3313 | KM Mean of Logged Data | | | | | -4.283 | 95% KM UTL (Lognormal)95% Coverage | | | | | 0.0408 |
| 3314 | KM SD of Logged Data | | | | | 0.396 | 95% KM UPL (Lognormal) | | | | | 0.0289 |
| 3315 | 95% KM Percentile Lognormal (z) | | | | | 0.0265 | 95% KM USL (Lognormal) | | | | | 0.0341 |
| 3316 | | | | | | | | | | | | |
| 3317 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 3318 | Mean in Original Scale | | | | | 0.0146 | Mean in Log Scale | | | | | -4.34 |
| 3319 | SD in Original Scale | | | | | 0.00722 | SD in Log Scale | | | | | 0.502 |
| 3320 | 95% UTL95% Coverage | | | | | 0.0514 | 95% UPL (t) | | | | | 0.0333 |
| 3321 | 90% Percentile (z) | | | | | 0.0248 | 95% Percentile (z) | | | | | 0.0297 |
| 3322 | 99% Percentile (z) | | | | | 0.0419 | 95% USL | | | | | 0.041 |
| 3323 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 3324 | | | | | | | | | | | | |
| 3325 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 3326 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 3327 | | | | | | | | | | | | |
| 3328 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 3329 | Order of Statistic, r | | | | | 12 | 95% UTL with95% Coverage | | | | | 0.03 |
| 3330 | Approx, f used to compute achieved CC | | | | | 0.632 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.46 |
| 3331 | Approximate Sample Size needed to achieve specified CC | | | | | 59 | 95% UPL | | | | | 0.03 |
| 3332 | 95% USL | | | | | 0.03 | 95% KM Chebyshev UPL | | | | | 0.0443 |
| 3333 | | | | | | | | | | | | |
| 3334 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 3335 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 3336 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 3337 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 3338 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 3339 | | | | | | | | | | | | |
| 3340 | LEAD-FLAMELESS, TOTAL | | | | | | | | | | | |
| 3341 | | | | | | | | | | | | |
| 3342 | General Statistics | | | | | | | | | | | |
| 3343 | Total Number of Observations | | | | | 13 | Number of Missing Observations | | | | | 33 |
| 3344 | Number of Distinct Observations | | | | | 6 | | | | | | |
| 3345 | Number of Detects | | | | | 8 | Number of Non-Detects | | | | | 5 |
| 3346 | Number of Distinct Detects | | | | | 4 | Number of Distinct Non-Detects | | | | | 3 |
| 3347 | Minimum Detect | | | | | 0.0031 | Minimum Non-Detect | | | | | 0.006 |
| 3348 | Maximum Detect | | | | | 0.01 | Maximum Non-Detect | | | | | 0.01 |
| 3349 | Variance Detected | | | | | 6.3627E-6 | Percent Non-Detects | | | | | 38.46% |
| 3350 | Mean Detected | | | | | 0.00794 | SD Detected | | | | | 0.00252 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 3351 | Mean of Detected Logged Data | | | | | -4.897 | SD of Detected Logged Data | | | | | 0.405 |
| 3352 | | | | | | | | | | | | |
| 3353 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 3354 | Tolerance Factor K (For UTL) | | | | 2.671 | | d2max (for USL) | | | | 2.331 | |
| 3355 | | | | | | | | | | | | |
| 3356 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 3357 | Shapiro Wilk Test Statistic | | | | 0.81 | | Shapiro Wilk GOF Test | | | | | |
| 3358 | 5% Shapiro Wilk Critical Value | | | | 0.818 | | Data Not Normal at 5% Significance Level | | | | | |
| 3359 | Lilliefors Test Statistic | | | | 0.293 | | Lilliefors GOF Test | | | | | |
| 3360 | 5% Lilliefors Critical Value | | | | 0.283 | | Data Not Normal at 5% Significance Level | | | | | |
| 3361 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 3362 | | | | | | | | | | | | |
| 3363 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 3364 | KM Mean | | | 0.00624 | | KM SD | | | 0.00292 | | | |
| 3365 | 95% UTL95% Coverage | | | 0.0141 | | 95% KM UPL (t) | | | 0.0116 | | | |
| 3366 | 90% KM Percentile (z) | | | 0.00999 | | 95% KM Percentile (z) | | | 0.011 | | | |
| 3367 | 99% KM Percentile (z) | | | 0.013 | | 95% KM USL | | | 0.0131 | | | |
| 3368 | | | | | | | | | | | | |
| 3369 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 3370 | Mean | | | 0.00622 | | SD | | | 0.00301 | | | |
| 3371 | 95% UTL95% Coverage | | | 0.0143 | | 95% UPL (t) | | | 0.0118 | | | |
| 3372 | 90% Percentile (z) | | | 0.0101 | | 95% Percentile (z) | | | 0.0112 | | | |
| 3373 | 99% Percentile (z) | | | 0.0132 | | 95% USL | | | 0.0132 | | | |
| 3374 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | |
| 3375 | | | | | | | | | | | | |
| 3376 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | |
| 3377 | A-D Test Statistic | | | 0.809 | | Anderson-Darling GOF Test | | | | | | |
| 3378 | 5% A-D Critical Value | | | 0.716 | | Data Not Gamma Distributed at 5% Significance Level | | | | | | |
| 3379 | K-S Test Statistic | | | 0.291 | | Kolmogorov-Smirnov GOF | | | | | | |
| 3380 | 5% K-S Critical Value | | | 0.295 | | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | |
| 3381 | Detected data follow Appr. Gamma Distribution at 5% Significance Level | | | | | | | | | | | |
| 3382 | | | | | | | | | | | | |
| 3383 | Gamma Statistics on Detected Data Only | | | | | | | | | | | |
| 3384 | k hat (MLE) | | | 8.446 | | k star (bias corrected MLE) | | | 5.362 | | | |
| 3385 | Theta hat (MLE) | | | 9.3979E-4 | | Theta star (bias corrected MLE) | | | 0.00148 | | | |
| 3386 | nu hat (MLE) | | | 135.1 | | nu star (bias corrected) | | | 85.79 | | | |
| 3387 | MLE Mean (bias corrected) | | | 0.00794 | | | | | | | | |
| 3388 | MLE Sd (bias corrected) | | | 0.00343 | | 95% Percentile of Chisquare (2kstar) | | | 19.3 | | | |
| 3389 | | | | | | | | | | | | |
| 3390 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | |
| 3391 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 3392 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | |
| 3393 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | |
| 3394 | This is especially true when the sample size is small. | | | | | | | | | | | |
| 3395 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 3396 | Minimum | | | 0.0031 | | Mean | | | 0.00873 | | | |
| 3397 | Maximum | | | 0.01 | | Median | | | 0.01 | | | |
| 3398 | SD | | | 0.00219 | | CV | | | 0.251 | | | |
| 3399 | k hat (MLE) | | | 11.64 | | k star (bias corrected MLE) | | | 9.007 | | | |
| 3400 | Theta hat (MLE) | | | 7.4994E-4 | | Theta star (bias corrected MLE) | | | 9.6937E-4 | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 3401 | | | | | nu hat (MLE) | 302.7 | | | | nu star (bias corrected) | | 234.2 |
| 3402 | | | | | MLE Mean (bias corrected) | 0.00873 | | | | MLE Sd (bias corrected) | | 0.00291 |
| 3403 | | | | | 95% Percentile of Chisquare (2kstar) | 28.89 | | | | 90% Percentile | | 0.0126 |
| 3404 | | | | | 95% Percentile | 0.014 | | | | 99% Percentile | | 0.0169 |
| 3405 | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | | | | |
| 3406 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | |
| 3407 | | | | | WH | HW | | | | WH | | HW |
| 3408 | | | | | 95% Approx. Gamma UTL with 95% Coverage | 0.0175 | 0.0182 | | | 95% Approx. Gamma UPL | 0.0143 | 0.0146 |
| 3409 | | | | | 95% Gamma USL | 0.0161 | 0.0166 | | | | | |
| 3410 | | | | | | | | | | | | |
| 3411 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | |
| 3412 | | | | | Mean (KM) | 0.00624 | | | | SD (KM) | | 0.00292 |
| 3413 | | | | | Variance (KM) | 8.5482E-6 | | | | SE of Mean (KM) | | 8.9124E-4 |
| 3414 | | | | | k hat (KM) | 4.556 | | | | k star (KM) | | 3.556 |
| 3415 | | | | | nu hat (KM) | 118.5 | | | | nu star (KM) | | 92.46 |
| 3416 | | | | | theta hat (KM) | 0.00137 | | | | theta star (KM) | | 0.00175 |
| 3417 | | | | | 80% gamma percentile (KM) | 0.00872 | | | | 90% gamma percentile (KM) | | 0.0107 |
| 3418 | | | | | 95% gamma percentile (KM) | 0.0125 | | | | 99% gamma percentile (KM) | | 0.0164 |
| 3419 | | | | | | | | | | | | |
| 3420 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | |
| 3421 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | |
| 3422 | | | | | WH | HW | | | | WH | | HW |
| 3423 | | | | | 95% Approx. Gamma UTL with 95% Coverage | 0.0174 | 0.0182 | | | 95% Approx. Gamma UPL | 0.0129 | 0.0132 |
| 3424 | | | | | 95% KM Gamma Percentile | 0.0119 | 0.0121 | | | 95% Gamma USL | 0.0154 | 0.016 |
| 3425 | | | | | | | | | | | | |
| 3426 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | |
| 3427 | | | | | Shapiro Wilk Test Statistic | 0.758 | | | | Shapiro Wilk GOF Test | | |
| 3428 | | | | | 5% Shapiro Wilk Critical Value | 0.818 | | | | Data Not Lognormal at 5% Significance Level | | |
| 3429 | | | | | Lilliefors Test Statistic | 0.264 | | | | Lilliefors GOF Test | | |
| 3430 | | | | | 5% Lilliefors Critical Value | 0.283 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 3431 | Detected Data appear Approximate Lognormal at 5% Significance Level | | | | | | | | | | | |
| 3432 | | | | | | | | | | | | |
| 3433 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | |
| 3434 | | | | | Mean in Original Scale | 0.00647 | | | | Mean in Log Scale | | -5.129 |
| 3435 | | | | | SD in Original Scale | 0.00275 | | | | SD in Log Scale | | 0.446 |
| 3436 | | | | | 95% UTL95% Coverage | 0.0195 | | | | 95% BCA UTL95% Coverage | | 0.01 |
| 3437 | | | | | 95% Bootstrap (%) UTL95% Coverage | 0.01 | | | | 95% UPL (t) | | 0.0135 |
| 3438 | | | | | 90% Percentile (z) | 0.0105 | | | | 95% Percentile (z) | | 0.0123 |
| 3439 | | | | | 99% Percentile (z) | 0.0167 | | | | 95% USL | | 0.0167 |
| 3440 | | | | | | | | | | | | |
| 3441 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | |
| 3442 | | | | | KM Mean of Logged Data | -5.2 | | | | 95% KM UTL (Lognormal)95% Coverage | | 0.0215 |
| 3443 | | | | | KM SD of Logged Data | 0.509 | | | | 95% KM UPL (Lognormal) | | 0.0141 |
| 3444 | | | | | 95% KM Percentile Lognormal (z) | 0.0127 | | | | 95% KM USL (Lognormal) | | 0.0181 |
| 3445 | | | | | | | | | | | | |
| 3446 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 3447 | | | | | Mean in Original Scale | 0.00622 | | | | Mean in Log Scale | | -5.2 |
| 3448 | | | | | SD in Original Scale | 0.00301 | | | | SD in Log Scale | | 0.521 |
| 3449 | | | | | 95% UTL95% Coverage | 0.0222 | | | | 95% UPL (t) | | 0.0145 |
| 3450 | | | | | 90% Percentile (z) | 0.0108 | | | | 95% Percentile (z) | | 0.013 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---------|-----------------------|-----------|---|---|---|---|---------|---|---------|
| 3451 | 99% Percentile (z) | | | | 0.0185 | 95% USL | | | | | | 0.0186 |
| 3452 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 3453 | | | | | | | | | | | | |
| 3454 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 3455 | Data appear to follow a Discernible Distribution at 5% Significance Level | | | | | | | | | | | |
| 3456 | | | | | | | | | | | | |
| 3457 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 3458 | Order of Statistic, r | | | | 13 | 95% UTL with 95% Coverage | | | | | | 0.01 |
| 3459 | Approx, f used to compute achieved CC | | | | 0.684 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | | 0.487 |
| 3460 | Approximate Sample Size needed to achieve specified CC | | | | 59 | 95% UPL | | | | | | 0.01 |
| 3461 | 95% USL | | | | 0.01 | 95% KM Chebyshev UPL | | | | | | 0.0195 |
| 3462 | | | | | | | | | | | | |
| 3463 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 3464 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 3465 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 3466 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 3467 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 3468 | | | | | | | | | | | | |
| 3469 | LEAD, DISSOLVED | | | | | | | | | | | |
| 3470 | | | | | | | | | | | | |
| 3471 | General Statistics | | | | | | | | | | | |
| 3472 | Total Number of Observations | | | | 13 | Number of Missing Observations | | | | | | 33 |
| 3473 | Number of Distinct Observations | | | | 8 | | | | | | | |
| 3474 | Number of Detects | | | | 8 | Number of Non-Detects | | | | | | 5 |
| 3475 | Number of Distinct Detects | | | | 7 | Number of Distinct Non-Detects | | | | | | 1 |
| 3476 | Minimum Detect | | | | 0.0025 | Minimum Non-Detect | | | | | | 0.006 |
| 3477 | Maximum Detect | | | | 0.01 | Maximum Non-Detect | | | | | | 0.006 |
| 3478 | Variance Detected | | | | 6.4000E-6 | Percent Non-Detects | | | | | | 38.46% |
| 3479 | Mean Detected | | | | 0.008 | SD Detected | | | | | | 0.00253 |
| 3480 | Mean of Detected Logged Data | | | | -4.901 | SD of Detected Logged Data | | | | | | 0.465 |
| 3481 | | | | | | | | | | | | |
| 3482 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 3483 | Tolerance Factor K (For UTL) | | | | 2.671 | d2max (for USL) | | | | | | 2.331 |
| 3484 | | | | | | | | | | | | |
| 3485 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 3486 | Shapiro Wilk Test Statistic | | | | 0.788 | Shapiro Wilk GOF Test | | | | | | |
| 3487 | 5% Shapiro Wilk Critical Value | | | | 0.818 | Data Not Normal at 5% Significance Level | | | | | | |
| 3488 | Lilliefors Test Statistic | | | | 0.313 | Lilliefors GOF Test | | | | | | |
| 3489 | 5% Lilliefors Critical Value | | | | 0.283 | Data Not Normal at 5% Significance Level | | | | | | |
| 3490 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 3491 | | | | | | | | | | | | |
| 3492 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 3493 | KM Mean | | 0.00588 | KM SD | | | | | | 0.00326 | | |
| 3494 | 95% UTL 95% Coverage | | 0.0146 | 95% KM UPL (t) | | | | | | 0.0119 | | |
| 3495 | 90% KM Percentile (z) | | 0.0101 | 95% KM Percentile (z) | | | | | | 0.0112 | | |
| 3496 | 99% KM Percentile (z) | | 0.0135 | 95% KM USL | | | | | | 0.0135 | | |
| 3497 | | | | | | | | | | | | |
| 3498 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 3499 | Mean | | 0.00608 | SD | | | | | | 0.00318 | | |
| 3500 | 95% UTL 95% Coverage | | 0.0146 | 95% UPL (t) | | | | | | 0.012 | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | |
|------|---|---|---|--------------------------------------|---|-----------|---|---|-----------------------|--------------------|----|-----------|--------|
| 3501 | | | | 90% Percentile (z) | | 0.0102 | | | | 95% Percentile (z) | | 0.0113 | |
| 3502 | | | | 99% Percentile (z) | | 0.0135 | | | | 95% USL | | 0.0135 | |
| 3503 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | | |
| 3504 | | | | | | | | | | | | | |
| 3505 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | | |
| 3506 | | | | A-D Test Statistic | | 1.053 | | Anderson-Darling GOF Test | | | | | |
| 3507 | | | | 5% A-D Critical Value | | 0.717 | | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3508 | | | | K-S Test Statistic | | 0.351 | | Kolmogorov-Smirnov GOF | | | | | |
| 3509 | | | | 5% K-S Critical Value | | 0.295 | | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3510 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | | |
| 3511 | | | | | | | | | | | | | |
| 3512 | Gamma Statistics on Detected Data Only | | | | | | | | | | | | |
| 3513 | | | | k hat (MLE) | | 7.043 | | k star (bias corrected MLE) | | | | 4.485 | |
| 3514 | | | | Theta hat (MLE) | | 0.00114 | | Theta star (bias corrected MLE) | | | | 0.00178 | |
| 3515 | | | | nu hat (MLE) | | 112.7 | | nu star (bias corrected) | | | | 71.77 | |
| 3516 | | | | MLE Mean (bias corrected) | | 0.008 | | | | | | | |
| 3517 | | | | MLE Sd (bias corrected) | | 0.00378 | | 95% Percentile of Chisquare (2kstar) | | | | 16.88 | |
| 3518 | | | | | | | | | | | | | |
| 3519 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | | |
| 3520 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | | |
| 3521 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | | |
| 3522 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | | |
| 3523 | This is especially true when the sample size is small. | | | | | | | | | | | | |
| 3524 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | | |
| 3525 | | | | Minimum | | 0.0025 | | Mean | | | | 0.00877 | |
| 3526 | | | | Maximum | | 0.01 | | Median | | | | 0.01 | |
| 3527 | | | | SD | | 0.00218 | | CV | | | | 0.249 | |
| 3528 | | | | k hat (MLE) | | 10.03 | | k star (bias corrected MLE) | | | | 7.763 | |
| 3529 | | | | Theta hat (MLE) | | 8.7470E-4 | | Theta star (bias corrected MLE) | | | | 0.00113 | |
| 3530 | | | | nu hat (MLE) | | 260.7 | | nu star (bias corrected) | | | | 201.8 | |
| 3531 | | | | MLE Mean (bias corrected) | | 0.00877 | | MLE Sd (bias corrected) | | | | 0.00315 | |
| 3532 | | | | 95% Percentile of Chisquare (2kstar) | | 25.68 | | 90% Percentile | | | | 0.013 | |
| 3533 | | | | 95% Percentile | | 0.0145 | | 99% Percentile | | | | 0.0177 | |
| 3534 | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | | | | | |
| 3535 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | |
| 3536 | | | | | | WH | | HW | | | WH | HW | |
| 3537 | 95% Approx. Gamma UTL with 95% Coverage | | | | | 0.0184 | | 0.0193 | 95% Approx. Gamma UPL | | | 0.0148 | 0.0152 |
| 3538 | 95% Gamma USL | | | | | 0.0169 | | 0.0175 | | | | | |
| 3539 | | | | | | | | | | | | | |
| 3540 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | | |
| 3541 | | | | Mean (KM) | | 0.00588 | | SD (KM) | | | | 0.00326 | |
| 3542 | | | | Variance (KM) | | 1.0606E-5 | | SE of Mean (KM) | | | | 9.6560E-4 | |
| 3543 | | | | k hat (KM) | | 3.265 | | k star (KM) | | | | 2.563 | |
| 3544 | | | | nu hat (KM) | | 84.89 | | nu star (KM) | | | | 66.63 | |
| 3545 | | | | theta hat (KM) | | 0.0018 | | theta star (KM) | | | | 0.0023 | |
| 3546 | | | | 80% gamma percentile (KM) | | 0.00855 | | 90% gamma percentile (KM) | | | | 0.0108 | |
| 3547 | | | | 95% gamma percentile (KM) | | 0.0129 | | 99% gamma percentile (KM) | | | | 0.0176 | |
| 3548 | | | | | | | | | | | | | |
| 3549 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | | |
| 3550 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|---------|--------|---|---|---|---|--------|--------|
| 3551 | | | | | WH | HW | | | | | WH | HW |
| 3552 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.0194 | 0.0206 | 95% Approx. Gamma UPL | | | | 0.0138 | 0.0141 |
| 3553 | 95% KM Gamma Percentile | | | | 0.0125 | 0.0128 | 95% Gamma USL | | | | 0.0169 | 0.0177 |
| 3554 | | | | | | | | | | | | |
| 3555 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | |
| 3556 | Shapiro Wilk Test Statistic | | | | 0.674 | | Shapiro Wilk GOF Test | | | | | |
| 3557 | 5% Shapiro Wilk Critical Value | | | | 0.818 | | Data Not Lognormal at 5% Significance Level | | | | | |
| 3558 | Lilliefors Test Statistic | | | | 0.353 | | Lilliefors GOF Test | | | | | |
| 3559 | 5% Lilliefors Critical Value | | | | 0.283 | | Data Not Lognormal at 5% Significance Level | | | | | |
| 3560 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 3561 | | | | | | | | | | | | |
| 3562 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | |
| 3563 | Mean in Original Scale | | | | 0.00627 | | Mean in Log Scale | | | | -5.201 | |
| 3564 | SD in Original Scale | | | | 0.00303 | | SD in Log Scale | | | | 0.553 | |
| 3565 | 95% UTL95% Coverage | | | | 0.0241 | | 95% BCA UTL95% Coverage | | | | 0.01 | |
| 3566 | 95% Bootstrap (%) UTL95% Coverage | | | | 0.01 | | 95% UPL (t) | | | | 0.0153 | |
| 3567 | 90% Percentile (z) | | | | 0.0112 | | 95% Percentile (z) | | | | 0.0137 | |
| 3568 | 99% Percentile (z) | | | | 0.02 | | 95% USL | | | | 0.02 | |
| 3569 | | | | | | | | | | | | |
| 3570 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | |
| 3571 | KM Mean of Logged Data | | | | -5.32 | | 95% KM UTL (Lognormal)95% Coverage | | | | 0.0264 | |
| 3572 | KM SD of Logged Data | | | | 0.631 | | 95% KM UPL (Lognormal) | | | | 0.0157 | |
| 3573 | 95% KM Percentile Lognormal (z) | | | | 0.0138 | | 95% KM USL (Lognormal) | | | | 0.0213 | |
| 3574 | | | | | | | | | | | | |
| 3575 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 3576 | Mean in Original Scale | | | | 0.00608 | | Mean in Log Scale | | | | -5.25 | |
| 3577 | SD in Original Scale | | | | 0.00318 | | SD in Log Scale | | | | 0.581 | |
| 3578 | 95% UTL95% Coverage | | | | 0.0248 | | 95% UPL (t) | | | | 0.0154 | |
| 3579 | 90% Percentile (z) | | | | 0.011 | | 95% Percentile (z) | | | | 0.0136 | |
| 3580 | 99% Percentile (z) | | | | 0.0203 | | 95% USL | | | | 0.0203 | |
| 3581 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 3582 | | | | | | | | | | | | |
| 3583 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 3584 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 3585 | | | | | | | | | | | | |
| 3586 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 3587 | Order of Statistic, r | | | | 13 | | 95% UTL with95% Coverage | | | | 0.01 | |
| 3588 | Approx, f used to compute achieved CC | | | | 0.684 | | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.487 | |
| 3589 | Approximate Sample Size needed to achieve specified CC | | | | 59 | | 95% UPL | | | | 0.01 | |
| 3590 | 95% USL | | | | 0.01 | | 95% KM Chebyshev UPL | | | | 0.0206 | |
| 3591 | | | | | | | | | | | | |
| 3592 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 3593 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 3594 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 3595 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 3596 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 3597 | | | | | | | | | | | | |
| 3598 | MERCURY, TOTAL | | | | | | | | | | | |
| 3599 | | | | | | | | | | | | |
| 3600 | General Statistics | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|-----|--------------------------------|---|---|---|---|-----------|
| 3601 | Total Number of Observations | | | | | 12 | Number of Missing Observations | | | | | 34 |
| 3602 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 3603 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 12 |
| 3604 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 3605 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 5.0000E-4 |
| 3606 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 5.0000E-4 |
| 3607 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 3608 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 3609 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 3610 | | | | | | | | | | | | |
| 3611 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 3612 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 3613 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 3614 | | | | | | | | | | | | |
| 3615 | The data set for variable MERCURY, TOTAL was not processed! | | | | | | | | | | | |
| 3616 | | | | | | | | | | | | |
| 3617 | | | | | | | | | | | | |
| 3618 | MERCURY, DISSOLVED | | | | | | | | | | | |
| 3619 | | | | | | | | | | | | |
| 3620 | General Statistics | | | | | | | | | | | |
| 3621 | Total Number of Observations | | | | | 12 | Number of Missing Observations | | | | | 34 |
| 3622 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 3623 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 12 |
| 3624 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 3625 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 5.0000E-4 |
| 3626 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 5.0000E-4 |
| 3627 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 3628 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 3629 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 3630 | | | | | | | | | | | | |
| 3631 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 3632 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 3633 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 3634 | | | | | | | | | | | | |
| 3635 | The data set for variable MERCURY, DISSOLVED was not processed! | | | | | | | | | | | |
| 3636 | | | | | | | | | | | | |
| 3637 | | | | | | | | | | | | |
| 3638 | SELENIUM, TOTAL | | | | | | | | | | | |
| 3639 | | | | | | | | | | | | |
| 3640 | General Statistics | | | | | | | | | | | |
| 3641 | Total Number of Observations | | | | | 12 | Number of Missing Observations | | | | | 34 |
| 3642 | Number of Distinct Observations | | | | | 2 | | | | | | |
| 3643 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 12 |
| 3644 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 2 |
| 3645 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 0.0056 |
| 3646 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 0.02 |
| 3647 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 3648 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 3649 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 3650 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|-----|---|--------------------------------|---|---|---|--------|---|
| 3651 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 3652 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 3653 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 3654 | | | | | | | | | | | | |
| 3655 | The data set for variable SELENIUM, TOTAL was not processed! | | | | | | | | | | | |
| 3656 | | | | | | | | | | | | |
| 3657 | | | | | | | | | | | | |
| 3658 | SELENIUM, DISSOLVED | | | | | | | | | | | |
| 3659 | | | | | | | | | | | | |
| 3660 | General Statistics | | | | | | | | | | | |
| 3661 | Total Number of Observations | | | | 12 | | Number of Missing Observations | | | | 34 | |
| 3662 | Number of Distinct Observations | | | | 2 | | | | | | | |
| 3663 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 12 | |
| 3664 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 2 | |
| 3665 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 0.0056 | |
| 3666 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 0.02 | |
| 3667 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 3668 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 3669 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 3670 | | | | | | | | | | | | |
| 3671 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 3672 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 3673 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 3674 | | | | | | | | | | | | |
| 3675 | The data set for variable SELENIUM, DISSOLVED was not processed! | | | | | | | | | | | |
| 3676 | | | | | | | | | | | | |
| 3677 | | | | | | | | | | | | |
| 3678 | SILVER, TOTAL | | | | | | | | | | | |
| 3679 | | | | | | | | | | | | |
| 3680 | General Statistics | | | | | | | | | | | |
| 3681 | Total Number of Observations | | | | 12 | | Number of Missing Observations | | | | 34 | |
| 3682 | Number of Distinct Observations | | | | 3 | | | | | | | |
| 3683 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 12 | |
| 3684 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 3 | |
| 3685 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 0.0022 | |
| 3686 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 0.0044 | |
| 3687 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 3688 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 3689 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 3690 | | | | | | | | | | | | |
| 3691 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 3692 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 3693 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 3694 | | | | | | | | | | | | |
| 3695 | The data set for variable SILVER, TOTAL was not processed! | | | | | | | | | | | |
| 3696 | | | | | | | | | | | | |
| 3697 | | | | | | | | | | | | |
| 3698 | SILVER, DISSOLVED | | | | | | | | | | | |
| 3699 | | | | | | | | | | | | |
| 3700 | General Statistics | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|-----------|--|---|---|---|---|--------|
| 3701 | Total Number of Observations | | | | | 12 | Number of Missing Observations | | | | | 34 |
| 3702 | Number of Distinct Observations | | | | | 2 | | | | | | |
| 3703 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 12 |
| 3704 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 2 |
| 3705 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 0.0022 |
| 3706 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 0.004 |
| 3707 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 3708 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 3709 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 3710 | | | | | | | | | | | | |
| 3711 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 3712 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 3713 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 3714 | | | | | | | | | | | | |
| 3715 | The data set for variable SILVER, DISSOLVED was not processed! | | | | | | | | | | | |
| 3716 | | | | | | | | | | | | |
| 3717 | | | | | | | | | | | | |
| 3718 | ZINC, TOTAL | | | | | | | | | | | |
| 3719 | | | | | | | | | | | | |
| 3720 | General Statistics | | | | | | | | | | | |
| 3721 | Total Number of Observations | | | | | 12 | Number of Missing Observations | | | | | 34 |
| 3722 | Number of Distinct Observations | | | | | 6 | | | | | | |
| 3723 | Number of Detects | | | | | 11 | Number of Non-Detects | | | | | 1 |
| 3724 | Number of Distinct Detects | | | | | 6 | Number of Distinct Non-Detects | | | | | 1 |
| 3725 | Minimum Detect | | | | | 0.01 | Minimum Non-Detect | | | | | 0.02 |
| 3726 | Maximum Detect | | | | | 0.11 | Maximum Non-Detect | | | | | 0.02 |
| 3727 | Variance Detected | | | | | 8.4182E-4 | Percent Non-Detects | | | | | 8.333% |
| 3728 | Mean Detected | | | | | 0.0373 | SD Detected | | | | | 0.029 |
| 3729 | Mean of Detected Logged Data | | | | | -3.506 | SD of Detected Logged Data | | | | | 0.666 |
| 3730 | | | | | | | | | | | | |
| 3731 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 3732 | Tolerance Factor K (For UTL) | | | | | 2.736 | d2max (for USL) | | | | | 2.285 |
| 3733 | | | | | | | | | | | | |
| 3734 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 3735 | Shapiro Wilk Test Statistic | | | | | 0.773 | Shapiro Wilk GOF Test | | | | | |
| 3736 | 5% Shapiro Wilk Critical Value | | | | | 0.85 | Data Not Normal at 5% Significance Level | | | | | |
| 3737 | Lilliefors Test Statistic | | | | | 0.281 | Lilliefors GOF Test | | | | | |
| 3738 | 5% Lilliefors Critical Value | | | | | 0.251 | Data Not Normal at 5% Significance Level | | | | | |
| 3739 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 3740 | | | | | | | | | | | | |
| 3741 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 3742 | KM Mean | | | | | 0.035 | KM SD | | | | | 0.0275 |
| 3743 | 95% UTL95% Coverage | | | | | 0.11 | 95% KM UPL (t) | | | | | 0.0865 |
| 3744 | 90% KM Percentile (z) | | | | | 0.0703 | 95% KM Percentile (z) | | | | | 0.0803 |
| 3745 | 99% KM Percentile (z) | | | | | 0.0991 | 95% KM USL | | | | | 0.0979 |
| 3746 | | | | | | | | | | | | |
| 3747 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 3748 | Mean | | | | | 0.035 | SD | | | | | 0.0288 |
| 3749 | 95% UTL95% Coverage | | | | | 0.114 | 95% UPL (t) | | | | | 0.0888 |
| 3750 | 90% Percentile (z) | | | | | 0.0719 | 95% Percentile (z) | | | | | 0.0823 |

| | A | B | C | D | E | F | G | H | I | J | K | L | | | | |
|------|---|---|---|---|-----------|-------|---|---|-----------------------|---|---------|-------|-------|--|--------|--|
| 3751 | 99% Percentile (z) | | | | | 0.102 | 95% USL | | | | | 0.101 | | | | |
| 3752 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | | | | | |
| 3753 | | | | | | | | | | | | | | | | |
| 3754 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | | | | | |
| 3755 | A-D Test Statistic | | | | 0.569 | | Anderson-Darling GOF Test | | | | | | | | | |
| 3756 | 5% A-D Critical Value | | | | 0.736 | | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | | | | |
| 3757 | K-S Test Statistic | | | | 0.2 | | Kolmogorov-Smirnov GOF | | | | | | | | | |
| 3758 | 5% K-S Critical Value | | | | 0.258 | | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | | | | |
| 3759 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | | | | | | | | | | |
| 3760 | | | | | | | | | | | | | | | | |
| 3761 | Gamma Statistics on Detected Data Only | | | | | | | | | | | | | | | |
| 3762 | k hat (MLE) | | | | 2.459 | | k star (bias corrected MLE) | | | | 1.849 | | | | | |
| 3763 | Theta hat (MLE) | | | | 0.0152 | | Theta star (bias corrected MLE) | | | | 0.0202 | | | | | |
| 3764 | nu hat (MLE) | | | | 54.09 | | nu star (bias corrected) | | | | 40.67 | | | | | |
| 3765 | MLE Mean (bias corrected) | | | | 0.0373 | | | | | | | | | | | |
| 3766 | MLE Sd (bias corrected) | | | | 0.0274 | | 95% Percentile of Chisquare (2kstar) | | | | 8.993 | | | | | |
| 3767 | | | | | | | | | | | | | | | | |
| 3768 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | | | | | |
| 3769 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | | | | | |
| 3770 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | | | | | |
| 3771 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | | | | | |
| 3772 | This is especially true when the sample size is small. | | | | | | | | | | | | | | | |
| 3773 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | | | | | |
| 3774 | Minimum | | | | 0.01 | | Mean | | | | 0.035 | | | | | |
| 3775 | Maximum | | | | 0.11 | | Median | | | | 0.025 | | | | | |
| 3776 | SD | | | | 0.0288 | | CV | | | | 0.822 | | | | | |
| 3777 | k hat (MLE) | | | | 2.188 | | k star (bias corrected MLE) | | | | 1.697 | | | | | |
| 3778 | Theta hat (MLE) | | | | 0.016 | | Theta star (bias corrected MLE) | | | | 0.0206 | | | | | |
| 3779 | nu hat (MLE) | | | | 52.51 | | nu star (bias corrected) | | | | 40.72 | | | | | |
| 3780 | MLE Mean (bias corrected) | | | | 0.035 | | MLE Sd (bias corrected) | | | | 0.0269 | | | | | |
| 3781 | 95% Percentile of Chisquare (2kstar) | | | | 8.486 | | 90% Percentile | | | | 0.0708 | | | | | |
| 3782 | 95% Percentile | | | | 0.0875 | | 99% Percentile | | | | 0.125 | | | | | |
| 3783 | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | | | | | | | | |
| 3784 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | | | | |
| 3785 | | | | | WH | | HW | | | | | | WH | | HW | |
| 3786 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.14 | | 0.148 | | 95% Approx. Gamma UPL | | | | 0.093 | | 0.0947 | |
| 3787 | 95% Gamma USL | | | | 0.114 | | 0.118 | | | | | | | | | |
| 3788 | | | | | | | | | | | | | | | | |
| 3789 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | | | | | |
| 3790 | Mean (KM) | | | | 0.035 | | SD (KM) | | | | 0.0275 | | | | | |
| 3791 | Variance (KM) | | | | 7.5833E-4 | | SE of Mean (KM) | | | | 0.00834 | | | | | |
| 3792 | k hat (KM) | | | | 1.615 | | k star (KM) | | | | 1.267 | | | | | |
| 3793 | nu hat (KM) | | | | 38.77 | | nu star (KM) | | | | 30.41 | | | | | |
| 3794 | theta hat (KM) | | | | 0.0217 | | theta star (KM) | | | | 0.0276 | | | | | |
| 3795 | 80% gamma percentile (KM) | | | | 0.0551 | | 90% gamma percentile (KM) | | | | 0.076 | | | | | |
| 3796 | 95% gamma percentile (KM) | | | | 0.0965 | | 99% gamma percentile (KM) | | | | 0.143 | | | | | |
| 3797 | | | | | | | | | | | | | | | | |
| 3798 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | | | | | |
| 3799 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | | | | |
| 3800 | | | | | WH | | HW | | | | | | WH | | HW | |

| | | | | | | | | | | | | |
|------|--|---|---|---|--------|--------|---|---|---|---|--------|--------|
| | A | B | C | D | E | F | G | H | I | J | K | L |
| 3801 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.133 | 0.14 | 95% Approx. Gamma UPL | | | | 0.0893 | 0.0906 |
| 3802 | 95% KM Gamma Percentile | | | | 0.0797 | 0.0803 | 95% Gamma USL | | | | 0.109 | 0.112 |
| 3803 | | | | | | | | | | | | |
| 3804 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | |
| 3805 | Shapiro Wilk Test Statistic | | | | 0.94 | | Shapiro Wilk GOF Test | | | | | |
| 3806 | 5% Shapiro Wilk Critical Value | | | | 0.85 | | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3807 | Lilliefors Test Statistic | | | | 0.183 | | Lilliefors GOF Test | | | | | |
| 3808 | 5% Lilliefors Critical Value | | | | 0.251 | | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3809 | Detected Data appear Lognormal at 5% Significance Level | | | | | | | | | | | |
| 3810 | | | | | | | | | | | | |
| 3811 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | |
| 3812 | Mean in Original Scale | | | | 0.0349 | | Mean in Log Scale | | | | -3.605 | |
| 3813 | SD in Original Scale | | | | 0.0288 | | SD in Log Scale | | | | 0.721 | |
| 3814 | 95% UTL95% Coverage | | | | 0.196 | | 95% BCA UTL95% Coverage | | | | 0.11 | |
| 3815 | 95% Bootstrap (%) UTL95% Coverage | | | | 0.11 | | 95% UPL (t) | | | | 0.105 | |
| 3816 | 90% Percentile (z) | | | | 0.0685 | | 95% Percentile (z) | | | | 0.089 | |
| 3817 | 99% Percentile (z) | | | | 0.146 | | 95% USL | | | | 0.141 | |
| 3818 | | | | | | | | | | | | |
| 3819 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | |
| 3820 | KM Mean of Logged Data | | | | -3.598 | | 95% KM UTL (Lognormal)95% Coverage | | | | 0.176 | |
| 3821 | KM SD of Logged Data | | | | 0.68 | | 95% KM UPL (Lognormal) | | | | 0.0975 | |
| 3822 | 95% KM Percentile Lognormal (z) | | | | 0.0837 | | 95% KM USL (Lognormal) | | | | 0.129 | |
| 3823 | | | | | | | | | | | | |
| 3824 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 3825 | Mean in Original Scale | | | | 0.035 | | Mean in Log Scale | | | | -3.598 | |
| 3826 | SD in Original Scale | | | | 0.0288 | | SD in Log Scale | | | | 0.71 | |
| 3827 | 95% UTL95% Coverage | | | | 0.191 | | 95% UPL (t) | | | | 0.103 | |
| 3828 | 90% Percentile (z) | | | | 0.068 | | 95% Percentile (z) | | | | 0.088 | |
| 3829 | 99% Percentile (z) | | | | 0.143 | | 95% USL | | | | 0.139 | |
| 3830 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 3831 | | | | | | | | | | | | |
| 3832 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 3833 | Data appear to follow a Discernible Distribution at 5% Significance Level | | | | | | | | | | | |
| 3834 | | | | | | | | | | | | |
| 3835 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 3836 | Order of Statistic, r | | | | 12 | | 95% UTL with95% Coverage | | | | 0.11 | |
| 3837 | Approx, f used to compute achieved CC | | | | 0.632 | | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.46 | |
| 3838 | Approximate Sample Size needed to achieve specified CC | | | | 59 | | 95% UPL | | | | 0.11 | |
| 3839 | 95% USL | | | | 0.11 | | 95% KM Chebyshev UPL | | | | 0.16 | |
| 3840 | | | | | | | | | | | | |
| 3841 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 3842 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 3843 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 3844 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 3845 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 3846 | | | | | | | | | | | | |
| 3847 | ZINC, DISSOLVED | | | | | | | | | | | |
| 3848 | | | | | | | | | | | | |
| 3849 | General Statistics | | | | | | | | | | | |
| 3850 | Total Number of Observations | | | | 12 | | Number of Missing Observations | | | | 34 | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|-----------|---|---|---|---|---|---------|
| 3851 | Number of Distinct Observations | | | | | 6 | | | | | | |
| 3852 | Number of Detects | | | | | 11 | Number of Non-Detects | | | | | 1 |
| 3853 | Number of Distinct Detects | | | | | 6 | Number of Distinct Non-Detects | | | | | 1 |
| 3854 | Minimum Detect | | | | | 0.01 | Minimum Non-Detect | | | | | 0.02 |
| 3855 | Maximum Detect | | | | | 0.11 | Maximum Non-Detect | | | | | 0.02 |
| 3856 | Variance Detected | | | | | 7.2727E-4 | Percent Non-Detects | | | | | 8.3333% |
| 3857 | Mean Detected | | | | | 0.0355 | SD Detected | | | | | 0.027 |
| 3858 | Mean of Detected Logged Data | | | | | -3.526 | SD of Detected Logged Data | | | | | 0.611 |
| 3859 | | | | | | | | | | | | |
| 3860 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 3861 | Tolerance Factor K (For UTL) | | | | | 2.736 | d2max (for USL) | | | | | 2.285 |
| 3862 | | | | | | | | | | | | |
| 3863 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 3864 | Shapiro Wilk Test Statistic | | | | | 0.711 | Shapiro Wilk GOF Test | | | | | |
| 3865 | 5% Shapiro Wilk Critical Value | | | | | 0.85 | Data Not Normal at 5% Significance Level | | | | | |
| 3866 | Lilliefors Test Statistic | | | | | 0.307 | Lilliefors GOF Test | | | | | |
| 3867 | 5% Lilliefors Critical Value | | | | | 0.251 | Data Not Normal at 5% Significance Level | | | | | |
| 3868 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 3869 | | | | | | | | | | | | |
| 3870 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 3871 | KM Mean | | | | | 0.0333 | KM SD | | | | | 0.0256 |
| 3872 | 95% UTL95% Coverage | | | | | 0.103 | 95% KM UPL (t) | | | | | 0.0812 |
| 3873 | 90% KM Percentile (z) | | | | | 0.0661 | 95% KM Percentile (z) | | | | | 0.0754 |
| 3874 | 99% KM Percentile (z) | | | | | 0.0929 | 95% KM USL | | | | | 0.0918 |
| 3875 | | | | | | | | | | | | |
| 3876 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 3877 | Mean | | | | | 0.0333 | SD | | | | | 0.0267 |
| 3878 | 95% UTL95% Coverage | | | | | 0.107 | 95% UPL (t) | | | | | 0.0833 |
| 3879 | 90% Percentile (z) | | | | | 0.0676 | 95% Percentile (z) | | | | | 0.0773 |
| 3880 | 99% Percentile (z) | | | | | 0.0955 | 95% USL | | | | | 0.0944 |
| 3881 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | |
| 3882 | | | | | | | | | | | | |
| 3883 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | |
| 3884 | A-D Test Statistic | | | | | 0.646 | Anderson-Darling GOF Test | | | | | |
| 3885 | 5% A-D Critical Value | | | | | 0.734 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 3886 | K-S Test Statistic | | | | | 0.256 | Kolmogorov-Smirnov GOF | | | | | |
| 3887 | 5% K-S Critical Value | | | | | 0.257 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 3888 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 3889 | | | | | | | | | | | | |
| 3890 | Gamma Statistics on Detected Data Only | | | | | | | | | | | |
| 3891 | k hat (MLE) | | | | | 2.832 | k star (bias corrected MLE) | | | | | 2.12 |
| 3892 | Theta hat (MLE) | | | | | 0.0125 | Theta star (bias corrected MLE) | | | | | 0.0167 |
| 3893 | nu hat (MLE) | | | | | 62.31 | nu star (bias corrected) | | | | | 46.65 |
| 3894 | MLE Mean (bias corrected) | | | | | 0.0355 | | | | | | |
| 3895 | MLE Sd (bias corrected) | | | | | 0.0243 | 95% Percentile of Chisquare (2kstar) | | | | | 9.876 |
| 3896 | | | | | | | | | | | | |
| 3897 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | |
| 3898 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 3899 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | |
| 3900 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | | | | |
|------|---|---|---|---|-----------|---|---|---|-----------------------|---|---------|---|--------|--|--------|--|
| 3901 | This is especially true when the sample size is small. | | | | | | | | | | | | | | | |
| 3902 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | | | | | |
| 3903 | Minimum | | | | 0.01 | | Mean | | | | 0.0333 | | | | | |
| 3904 | Maximum | | | | 0.11 | | Median | | | | 0.03 | | | | | |
| 3905 | SD | | | | 0.0267 | | CV | | | | 0.802 | | | | | |
| 3906 | k hat (MLE) | | | | 2.479 | | k star (bias corrected MLE) | | | | 1.915 | | | | | |
| 3907 | Theta hat (MLE) | | | | 0.0134 | | Theta star (bias corrected MLE) | | | | 0.0174 | | | | | |
| 3908 | nu hat (MLE) | | | | 59.51 | | nu star (bias corrected) | | | | 45.96 | | | | | |
| 3909 | MLE Mean (bias corrected) | | | | 0.0333 | | MLE Sd (bias corrected) | | | | 0.0241 | | | | | |
| 3910 | 95% Percentile of Chisquare (2kstar) | | | | 9.211 | | 90% Percentile | | | | 0.0655 | | | | | |
| 3911 | 95% Percentile | | | | 0.0802 | | 99% Percentile | | | | 0.113 | | | | | |
| 3912 | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | | | | | | | | |
| 3913 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | | | | |
| 3914 | | | | | WH | | HW | | | | | | WH | | HW | |
| 3915 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.125 | | 0.131 | | 95% Approx. Gamma UPL | | | | 0.0846 | | 0.0858 | |
| 3916 | 95% Gamma USL | | | | 0.103 | | 0.106 | | | | | | | | | |
| 3917 | | | | | | | | | | | | | | | | |
| 3918 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | | | | | |
| 3919 | Mean (KM) | | | | 0.0333 | | SD (KM) | | | | 0.0256 | | | | | |
| 3920 | Variance (KM) | | | | 6.5556E-4 | | SE of Mean (KM) | | | | 0.00775 | | | | | |
| 3921 | k hat (KM) | | | | 1.695 | | k star (KM) | | | | 1.327 | | | | | |
| 3922 | nu hat (KM) | | | | 40.68 | | nu star (KM) | | | | 31.84 | | | | | |
| 3923 | theta hat (KM) | | | | 0.0197 | | theta star (KM) | | | | 0.0251 | | | | | |
| 3924 | 80% gamma percentile (KM) | | | | 0.0523 | | 90% gamma percentile (KM) | | | | 0.0716 | | | | | |
| 3925 | 95% gamma percentile (KM) | | | | 0.0905 | | 99% gamma percentile (KM) | | | | 0.134 | | | | | |
| 3926 | | | | | | | | | | | | | | | | |
| 3927 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | | | | | |
| 3928 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | | | | |
| 3929 | | | | | WH | | HW | | | | | | WH | | HW | |
| 3930 | 95% Approx. Gamma UTL with 95% Coverage | | | | 0.119 | | 0.124 | | 95% Approx. Gamma UPL | | | | 0.0813 | | 0.0823 | |
| 3931 | 95% KM Gamma Percentile | | | | 0.0731 | | 0.0734 | | 95% Gamma USL | | | | 0.0983 | | 0.101 | |
| 3932 | | | | | | | | | | | | | | | | |
| 3933 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | | | | | |
| 3934 | Shapiro Wilk Test Statistic | | | | 0.929 | | Shapiro Wilk GOF Test | | | | | | | | | |
| 3935 | 5% Shapiro Wilk Critical Value | | | | 0.85 | | Detected Data appear Lognormal at 5% Significance Level | | | | | | | | | |
| 3936 | Lilliefors Test Statistic | | | | 0.214 | | Lilliefors GOF Test | | | | | | | | | |
| 3937 | 5% Lilliefors Critical Value | | | | 0.251 | | Detected Data appear Lognormal at 5% Significance Level | | | | | | | | | |
| 3938 | Detected Data appear Lognormal at 5% Significance Level | | | | | | | | | | | | | | | |
| 3939 | | | | | | | | | | | | | | | | |
| 3940 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | | | | | |
| 3941 | Mean in Original Scale | | | | 0.0333 | | Mean in Log Scale | | | | -3.616 | | | | | |
| 3942 | SD in Original Scale | | | | 0.0267 | | SD in Log Scale | | | | 0.659 | | | | | |
| 3943 | 95% UTL95% Coverage | | | | 0.163 | | 95% BCA UTL95% Coverage | | | | 0.11 | | | | | |
| 3944 | 95% Bootstrap (%) UTL95% Coverage | | | | 0.11 | | 95% UPL (t) | | | | 0.0922 | | | | | |
| 3945 | 90% Percentile (z) | | | | 0.0626 | | 95% Percentile (z) | | | | 0.0796 | | | | | |
| 3946 | 99% Percentile (z) | | | | 0.125 | | 95% USL | | | | 0.121 | | | | | |
| 3947 | | | | | | | | | | | | | | | | |
| 3948 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | | | | | |
| 3949 | KM Mean of Logged Data | | | | -3.616 | | 95% KM UTL (Lognormal)95% Coverage | | | | 0.152 | | | | | |
| 3950 | KM SD of Logged Data | | | | 0.632 | | 95% KM UPL (Lognormal) | | | | 0.0876 | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|--------|---|---|---|---|---|--------|
| 3951 | 95% KM Percentile Lognormal (z) | | | | | 0.076 | 95% KM USL (Lognormal) | | | | | 0.114 |
| 3952 | | | | | | | | | | | | |
| 3953 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 3954 | Mean in Original Scale | | | | | 0.0333 | Mean in Log Scale | | | | | -3.616 |
| 3955 | SD in Original Scale | | | | | 0.0267 | SD in Log Scale | | | | | 0.66 |
| 3956 | 95% UTL95% Coverage | | | | | 0.164 | 95% UPL (t) | | | | | 0.0924 |
| 3957 | 90% Percentile (z) | | | | | 0.0627 | 95% Percentile (z) | | | | | 0.0796 |
| 3958 | 99% Percentile (z) | | | | | 0.125 | 95% USL | | | | | 0.122 |
| 3959 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 3960 | | | | | | | | | | | | |
| 3961 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 3962 | Data appear to follow a Discernible Distribution at 5% Significance Level | | | | | | | | | | | |
| 3963 | | | | | | | | | | | | |
| 3964 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 3965 | Order of Statistic, r | | | | | 12 | 95% UTL with95% Coverage | | | | | 0.11 |
| 3966 | Approx, f used to compute achieved CC | | | | | 0.632 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.46 |
| 3967 | Approximate Sample Size needed to achieve specified CC | | | | | 59 | 95% UPL | | | | | 0.11 |
| 3968 | 95% USL | | | | | 0.11 | 95% KM Chebyshev UPL | | | | | 0.149 |
| 3969 | | | | | | | | | | | | |
| 3970 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 3971 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 3972 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 3973 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 3974 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 3975 | | | | | | | | | | | | |
| 3976 | BROMOFORM | | | | | | | | | | | |
| 3977 | | | | | | | | | | | | |
| 3978 | General Statistics | | | | | | | | | | | |
| 3979 | Total Number of Observations | | | | | 33 | Number of Missing Observations | | | | | 13 |
| 3980 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 3981 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 33 |
| 3982 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 3983 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 3984 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 3985 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 3986 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 3987 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 3988 | | | | | | | | | | | | |
| 3989 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 3990 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 3991 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 3992 | | | | | | | | | | | | |
| 3993 | The data set for variable BROMOFORM was not processed! | | | | | | | | | | | |
| 3994 | | | | | | | | | | | | |
| 3995 | | | | | | | | | | | | |
| 3996 | BROMOMETHANE | | | | | | | | | | | |
| 3997 | | | | | | | | | | | | |
| 3998 | General Statistics | | | | | | | | | | | |
| 3999 | Total Number of Observations | | | | | 33 | Number of Missing Observations | | | | | 13 |
| 4000 | Number of Distinct Observations | | | | | 1 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|-----|--------------------------------|---|---|---|---|------|
| 4001 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 33 |
| 4002 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4003 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4004 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4005 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4006 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4007 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4008 | | | | | | | | | | | | |
| 4009 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4010 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4011 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4012 | | | | | | | | | | | | |
| 4013 | The data set for variable BROMOMETHANE was not processed! | | | | | | | | | | | |
| 4014 | | | | | | | | | | | | |
| 4015 | | | | | | | | | | | | |
| 4016 | CARBON TETRACHLORIDE | | | | | | | | | | | |
| 4017 | | | | | | | | | | | | |
| 4018 | General Statistics | | | | | | | | | | | |
| 4019 | Total Number of Observations | | | | | 33 | Number of Missing Observations | | | | | 13 |
| 4020 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 4021 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 33 |
| 4022 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4023 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4024 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4025 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4026 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4027 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4028 | | | | | | | | | | | | |
| 4029 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4030 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4031 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4032 | | | | | | | | | | | | |
| 4033 | The data set for variable CARBON TETRACHLORIDE was not processed! | | | | | | | | | | | |
| 4034 | | | | | | | | | | | | |
| 4035 | | | | | | | | | | | | |
| 4036 | CHLORO BENZENE | | | | | | | | | | | |
| 4037 | | | | | | | | | | | | |
| 4038 | General Statistics | | | | | | | | | | | |
| 4039 | Total Number of Observations | | | | | 33 | Number of Missing Observations | | | | | 13 |
| 4040 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 4041 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 33 |
| 4042 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4043 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4044 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4045 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4046 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4047 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4048 | | | | | | | | | | | | |
| 4049 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4050 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | | | | |
|------|--|---|---|---|-----|---|---|---|--------------------------------|---|---|---|------|--|--|--|
| 4051 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | | | | | |
| 4052 | | | | | | | | | | | | | | | | |
| 4053 | The data set for variable CHLOROBENZENE was not processed! | | | | | | | | | | | | | | | |
| 4054 | | | | | | | | | | | | | | | | |
| 4055 | | | | | | | | | | | | | | | | |
| 4056 | CHLOROETHANE | | | | | | | | | | | | | | | |
| 4057 | | | | | | | | | | | | | | | | |
| 4058 | General Statistics | | | | | | | | | | | | | | | |
| 4059 | Total Number of Observations | | | | 33 | | | | Number of Missing Observations | | | | 13 | | | |
| 4060 | Number of Distinct Observations | | | | 1 | | | | | | | | | | | |
| 4061 | Number of Detects | | | | 0 | | | | Number of Non-Detects | | | | 33 | | | |
| 4062 | Number of Distinct Detects | | | | 0 | | | | Number of Distinct Non-Detects | | | | 1 | | | |
| 4063 | Minimum Detect | | | | N/A | | | | Minimum Non-Detect | | | | 1 | | | |
| 4064 | Maximum Detect | | | | N/A | | | | Maximum Non-Detect | | | | 1 | | | |
| 4065 | Variance Detected | | | | N/A | | | | Percent Non-Detects | | | | 100% | | | |
| 4066 | Mean Detected | | | | N/A | | | | SD Detected | | | | N/A | | | |
| 4067 | Mean of Detected Logged Data | | | | N/A | | | | SD of Detected Logged Data | | | | N/A | | | |
| 4068 | | | | | | | | | | | | | | | | |
| 4069 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | | | | | |
| 4070 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | | | | | |
| 4071 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | | | | | |
| 4072 | | | | | | | | | | | | | | | | |
| 4073 | The data set for variable CHLOROETHANE was not processed! | | | | | | | | | | | | | | | |
| 4074 | | | | | | | | | | | | | | | | |
| 4075 | | | | | | | | | | | | | | | | |
| 4076 | DIBROMOCHLOROMETHANE | | | | | | | | | | | | | | | |
| 4077 | | | | | | | | | | | | | | | | |
| 4078 | General Statistics | | | | | | | | | | | | | | | |
| 4079 | Total Number of Observations | | | | 33 | | | | Number of Missing Observations | | | | 13 | | | |
| 4080 | Number of Distinct Observations | | | | 1 | | | | | | | | | | | |
| 4081 | Number of Detects | | | | 0 | | | | Number of Non-Detects | | | | 33 | | | |
| 4082 | Number of Distinct Detects | | | | 0 | | | | Number of Distinct Non-Detects | | | | 1 | | | |
| 4083 | Minimum Detect | | | | N/A | | | | Minimum Non-Detect | | | | 1 | | | |
| 4084 | Maximum Detect | | | | N/A | | | | Maximum Non-Detect | | | | 1 | | | |
| 4085 | Variance Detected | | | | N/A | | | | Percent Non-Detects | | | | 100% | | | |
| 4086 | Mean Detected | | | | N/A | | | | SD Detected | | | | N/A | | | |
| 4087 | Mean of Detected Logged Data | | | | N/A | | | | SD of Detected Logged Data | | | | N/A | | | |
| 4088 | | | | | | | | | | | | | | | | |
| 4089 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | | | | | |
| 4090 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | | | | | |
| 4091 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | | | | | |
| 4092 | | | | | | | | | | | | | | | | |
| 4093 | The data set for variable DIBROMOCHLOROMETHANE was not processed! | | | | | | | | | | | | | | | |
| 4094 | | | | | | | | | | | | | | | | |
| 4095 | | | | | | | | | | | | | | | | |
| 4096 | CHLOROMETHANE | | | | | | | | | | | | | | | |
| 4097 | | | | | | | | | | | | | | | | |
| 4098 | General Statistics | | | | | | | | | | | | | | | |
| 4099 | Total Number of Observations | | | | 33 | | | | Number of Missing Observations | | | | 13 | | | |
| 4100 | Number of Distinct Observations | | | | 1 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|-----|--------------------------------|---|---|---|---|------|
| 4101 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 33 |
| 4102 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4103 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4104 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4105 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4106 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4107 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4108 | | | | | | | | | | | | |
| 4109 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4110 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4111 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4112 | | | | | | | | | | | | |
| 4113 | The data set for variable CHLOROMETHANE was not processed! | | | | | | | | | | | |
| 4114 | | | | | | | | | | | | |
| 4115 | | | | | | | | | | | | |
| 4116 | 3-CHLORO-1-PROPENE | | | | | | | | | | | |
| 4117 | | | | | | | | | | | | |
| 4118 | General Statistics | | | | | | | | | | | |
| 4119 | Total Number of Observations | | | | | 33 | Number of Missing Observations | | | | | 13 |
| 4120 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 4121 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 33 |
| 4122 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4123 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4124 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4125 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4126 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4127 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4128 | | | | | | | | | | | | |
| 4129 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4130 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4131 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4132 | | | | | | | | | | | | |
| 4133 | The data set for variable 3-CHLORO-1-PROPENE was not processed! | | | | | | | | | | | |
| 4134 | | | | | | | | | | | | |
| 4135 | | | | | | | | | | | | |
| 4136 | 1,2-DICHLOROBENZENE | | | | | | | | | | | |
| 4137 | | | | | | | | | | | | |
| 4138 | General Statistics | | | | | | | | | | | |
| 4139 | Total Number of Observations | | | | | 33 | Number of Missing Observations | | | | | 13 |
| 4140 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 4141 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 33 |
| 4142 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4143 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4144 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4145 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4146 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4147 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4148 | | | | | | | | | | | | |
| 4149 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4150 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|-----|---|--------------------------------|---|---|---|------|---|
| 4151 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4152 | | | | | | | | | | | | |
| 4153 | The data set for variable 1,2-DICHLOROBENZENE was not processed! | | | | | | | | | | | |
| 4154 | | | | | | | | | | | | |
| 4155 | | | | | | | | | | | | |
| 4156 | 1,3-DICHLOROBENZENE | | | | | | | | | | | |
| 4157 | | | | | | | | | | | | |
| 4158 | General Statistics | | | | | | | | | | | |
| 4159 | Total Number of Observations | | | | 33 | | Number of Missing Observations | | | | 13 | |
| 4160 | Number of Distinct Observations | | | | 1 | | | | | | | |
| 4161 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 33 | |
| 4162 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 1 | |
| 4163 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 1 | |
| 4164 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 1 | |
| 4165 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 4166 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 4167 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 4168 | | | | | | | | | | | | |
| 4169 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4170 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4171 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4172 | | | | | | | | | | | | |
| 4173 | The data set for variable 1,3-DICHLOROBENZENE was not processed! | | | | | | | | | | | |
| 4174 | | | | | | | | | | | | |
| 4175 | | | | | | | | | | | | |
| 4176 | 1,4-DICHLOROBENZENE | | | | | | | | | | | |
| 4177 | | | | | | | | | | | | |
| 4178 | General Statistics | | | | | | | | | | | |
| 4179 | Total Number of Observations | | | | 33 | | Number of Missing Observations | | | | 13 | |
| 4180 | Number of Distinct Observations | | | | 1 | | | | | | | |
| 4181 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 33 | |
| 4182 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 1 | |
| 4183 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 1 | |
| 4184 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 1 | |
| 4185 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 4186 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 4187 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 4188 | | | | | | | | | | | | |
| 4189 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4190 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4191 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4192 | | | | | | | | | | | | |
| 4193 | The data set for variable 1,4-DICHLOROBENZENE was not processed! | | | | | | | | | | | |
| 4194 | | | | | | | | | | | | |
| 4195 | | | | | | | | | | | | |
| 4196 | DICHLORODIFLUOROMETHANE | | | | | | | | | | | |
| 4197 | | | | | | | | | | | | |
| 4198 | General Statistics | | | | | | | | | | | |
| 4199 | Total Number of Observations | | | | 33 | | Number of Missing Observations | | | | 13 | |
| 4200 | Number of Distinct Observations | | | | 1 | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|-----|--------------------------------|---|---|---|---|------|
| 4201 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 33 |
| 4202 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4203 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4204 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4205 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4206 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4207 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4208 | | | | | | | | | | | | |
| 4209 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4210 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4211 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4212 | | | | | | | | | | | | |
| 4213 | The data set for variable DICHLORODIFLUOROMETHANE was not processed! | | | | | | | | | | | |
| 4214 | | | | | | | | | | | | |
| 4215 | | | | | | | | | | | | |
| 4216 | 1,2-DICHLOROPROPANE | | | | | | | | | | | |
| 4217 | | | | | | | | | | | | |
| 4218 | General Statistics | | | | | | | | | | | |
| 4219 | Total Number of Observations | | | | | 33 | Number of Missing Observations | | | | | 13 |
| 4220 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 4221 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 33 |
| 4222 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4223 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4224 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4225 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4226 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4227 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4228 | | | | | | | | | | | | |
| 4229 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4230 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4231 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4232 | | | | | | | | | | | | |
| 4233 | The data set for variable 1,2-DICHLOROPROPANE was not processed! | | | | | | | | | | | |
| 4234 | | | | | | | | | | | | |
| 4235 | | | | | | | | | | | | |
| 4236 | cis 1,3-DICHLOROPROPENE | | | | | | | | | | | |
| 4237 | | | | | | | | | | | | |
| 4238 | General Statistics | | | | | | | | | | | |
| 4239 | Total Number of Observations | | | | | 33 | Number of Missing Observations | | | | | 13 |
| 4240 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 4241 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 33 |
| 4242 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4243 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4244 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4245 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4246 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4247 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4248 | | | | | | | | | | | | |
| 4249 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4250 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L | | | | |
|------|--|---|---|---|-------|---|---|---|--------------------------------|---|---|---|--------|--|--|--|
| 4251 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | | | | | |
| 4252 | | | | | | | | | | | | | | | | |
| 4253 | The data set for variable cis 1,3-DICHLOROPROPENE was not processed! | | | | | | | | | | | | | | | |
| 4254 | | | | | | | | | | | | | | | | |
| 4255 | | | | | | | | | | | | | | | | |
| 4256 | trans 1,3-DICHLOROPROPENE | | | | | | | | | | | | | | | |
| 4257 | | | | | | | | | | | | | | | | |
| 4258 | General Statistics | | | | | | | | | | | | | | | |
| 4259 | Total Number of Observations | | | | 33 | | | | Number of Missing Observations | | | | 13 | | | |
| 4260 | Number of Distinct Observations | | | | 1 | | | | | | | | | | | |
| 4261 | Number of Detects | | | | 0 | | | | Number of Non-Detects | | | | 33 | | | |
| 4262 | Number of Distinct Detects | | | | 0 | | | | Number of Distinct Non-Detects | | | | 1 | | | |
| 4263 | Minimum Detect | | | | N/A | | | | Minimum Non-Detect | | | | 1 | | | |
| 4264 | Maximum Detect | | | | N/A | | | | Maximum Non-Detect | | | | 1 | | | |
| 4265 | Variance Detected | | | | N/A | | | | Percent Non-Detects | | | | 100% | | | |
| 4266 | Mean Detected | | | | N/A | | | | SD Detected | | | | N/A | | | |
| 4267 | Mean of Detected Logged Data | | | | N/A | | | | SD of Detected Logged Data | | | | N/A | | | |
| 4268 | | | | | | | | | | | | | | | | |
| 4269 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | | | | | |
| 4270 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | | | | | |
| 4271 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | | | | | |
| 4272 | | | | | | | | | | | | | | | | |
| 4273 | The data set for variable trans 1,3-DICHLOROPROPENE was not processed! | | | | | | | | | | | | | | | |
| 4274 | | | | | | | | | | | | | | | | |
| 4275 | | | | | | | | | | | | | | | | |
| 4276 | 2-BUTANONE (MEK) | | | | | | | | | | | | | | | |
| 4277 | | | | | | | | | | | | | | | | |
| 4278 | General Statistics | | | | | | | | | | | | | | | |
| 4279 | Total Number of Observations | | | | 33 | | | | Number of Missing Observations | | | | 13 | | | |
| 4280 | Number of Distinct Observations | | | | 4 | | | | | | | | | | | |
| 4281 | Number of Detects | | | | 2 | | | | Number of Non-Detects | | | | 31 | | | |
| 4282 | Number of Distinct Detects | | | | 2 | | | | Number of Distinct Non-Detects | | | | 2 | | | |
| 4283 | Minimum Detect | | | | 21.4 | | | | Minimum Non-Detect | | | | 10 | | | |
| 4284 | Maximum Detect | | | | 97.9 | | | | Maximum Non-Detect | | | | 720 | | | |
| 4285 | Variance Detected | | | | 2926 | | | | Percent Non-Detects | | | | 93.94% | | | |
| 4286 | Mean Detected | | | | 59.65 | | | | SD Detected | | | | 54.09 | | | |
| 4287 | Mean of Detected Logged Data | | | | 3.824 | | | | SD of Detected Logged Data | | | | 1.075 | | | |
| 4288 | | | | | | | | | | | | | | | | |
| 4289 | Warning: Data set has only 2 Detected Values. | | | | | | | | | | | | | | | |
| 4290 | This is not enough to compute meaningful or reliable statistics and estimates. | | | | | | | | | | | | | | | |
| 4291 | | | | | | | | | | | | | | | | |
| 4292 | | | | | | | | | | | | | | | | |
| 4293 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | | | | | |
| 4294 | Tolerance Factor K (For UTL) | | | | 2.176 | | | | d2max (for USL) | | | | 2.787 | | | |
| 4295 | | | | | | | | | | | | | | | | |
| 4296 | Normal GOF Test on Detects Only | | | | | | | | | | | | | | | |
| 4297 | Not Enough Data to Perform GOF Test | | | | | | | | | | | | | | | |
| 4298 | | | | | | | | | | | | | | | | |
| 4299 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | | | | | |
| 4300 | KM Mean | | | | 13.1 | | | | KM SD | | | | 15.36 | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|---|-------|---|-------|---|--------------------------------------|----|--------|
| 4301 | | | | 95% UTL95% Coverage | | 46.52 | | | | 95% KM UPL (t) | | 39.51 |
| 4302 | | | | 90% KM Percentile (z) | | 32.79 | | | | 95% KM Percentile (z) | | 38.37 |
| 4303 | | | | 99% KM Percentile (z) | | 48.83 | | | | 95% KM USL | | 55.9 |
| 4304 | | | | | | | | | | | | |
| 4305 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 4306 | | | | Mean | | 19.07 | | | | SD | | 63.34 |
| 4307 | | | | 95% UTL95% Coverage | | 156.9 | | | | 95% UPL (t) | | 128 |
| 4308 | | | | 90% Percentile (z) | | 100.2 | | | | 95% Percentile (z) | | 123.3 |
| 4309 | | | | 99% Percentile (z) | | 166.4 | | | | 95% USL | | 195.6 |
| 4310 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | |
| 4311 | | | | | | | | | | | | |
| 4312 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | |
| 4313 | Not Enough Data to Perform GOF Test | | | | | | | | | | | |
| 4314 | | | | | | | | | | | | |
| 4315 | Gamma Statistics on Detected Data Only | | | | | | | | | | | |
| 4316 | | | | k hat (MLE) | | 2.039 | | | | k star (bias corrected MLE) | | N/A |
| 4317 | | | | Theta hat (MLE) | | 29.25 | | | | Theta star (bias corrected MLE) | | N/A |
| 4318 | | | | nu hat (MLE) | | 8.156 | | | | nu star (bias corrected) | | N/A |
| 4319 | | | | MLE Mean (bias corrected) | | N/A | | | | | | |
| 4320 | | | | MLE Sd (bias corrected) | | N/A | | | | 95% Percentile of Chisquare (2kstar) | | N/A |
| 4321 | | | | | | | | | | | | |
| 4322 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | |
| 4323 | | | | Mean (KM) | | 13.1 | | | | SD (KM) | | 15.36 |
| 4324 | | | | Variance (KM) | | 235.9 | | | | SE of Mean (KM) | | 3.84 |
| 4325 | | | | k hat (KM) | | 0.728 | | | | k star (KM) | | 0.682 |
| 4326 | | | | nu hat (KM) | | 48.04 | | | | nu star (KM) | | 45.01 |
| 4327 | | | | theta hat (KM) | | 18 | | | | theta star (KM) | | 19.22 |
| 4328 | | | | 80% gamma percentile (KM) | | 21.56 | | | | 90% gamma percentile (KM) | | 33.09 |
| 4329 | | | | 95% gamma percentile (KM) | | 45.02 | | | | 99% gamma percentile (KM) | | 73.56 |
| 4330 | | | | | | | | | | | | |
| 4331 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | |
| 4332 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | |
| 4333 | | | | | | WH | | HW | | | WH | HW |
| 4334 | | | | 95% Approx. Gamma UTL with 95% Coverage | | 32.82 | | 31.27 | | 95% Approx. Gamma UPL | | 27.06 |
| 4335 | | | | 95% KM Gamma Percentile | | 26.19 | | 24.95 | | 95% Gamma USL | | 41.74 |
| 4336 | | | | | | | | | | | | |
| 4337 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | |
| 4338 | Not Enough Data to Perform GOF Test | | | | | | | | | | | |
| 4339 | | | | | | | | | | | | |
| 4340 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | |
| 4341 | | | | Mean in Original Scale | | 3.784 | | | | Mean in Log Scale | | -5.528 |
| 4342 | | | | SD in Original Scale | | 17.3 | | | | SD in Log Scale | | 4.614 |
| 4343 | | | | 95% UTL95% Coverage | | 91.09 | | | | 95% BCA UTL95% Coverage | | 97.9 |
| 4344 | | | | 95% Bootstrap (%) UTL95% Coverage | | 97.9 | | | | 95% UPL (t) | | 11.08 |
| 4345 | | | | 90% Percentile (z) | | 1.469 | | | | 95% Percentile (z) | | 7.854 |
| 4346 | | | | 99% Percentile (z) | | 182.2 | | | | 95% USL | | 1524 |
| 4347 | | | | | | | | | | | | |
| 4348 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | |
| 4349 | | | | KM Mean of Logged Data | | 2.398 | | | | 95% KM UTL (Lognormal)95% Coverage | | 27.09 |
| 4350 | | | | KM SD of Logged Data | | 0.414 | | | | 95% KM UPL (Lognormal) | | 22.42 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|-------|---|---|---|---|---|-------|
| 4351 | 95% KM Percentile Lognormal (z) | | | | | 21.74 | 95% KM USL (Lognormal) | | | | | 34.89 |
| 4352 | | | | | | | | | | | | |
| 4353 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 4354 | Mean in Original Scale | | | | | 19.07 | Mean in Log Scale | | | | | 1.873 |
| 4355 | SD in Original Scale | | | | | 63.34 | SD in Log Scale | | | | | 0.918 |
| 4356 | 95% UTL95% Coverage | | | | | 47.96 | 95% UPL (t) | | | | | 31.54 |
| 4357 | 90% Percentile (z) | | | | | 21.1 | 95% Percentile (z) | | | | | 29.46 |
| 4358 | 99% Percentile (z) | | | | | 55.06 | 95% USL | | | | | 84 |
| 4359 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 4360 | | | | | | | | | | | | |
| 4361 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 4362 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 4363 | | | | | | | | | | | | |
| 4364 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 4365 | Order of Statistic, r | | | | | 33 | 95% UTL with95% Coverage | | | | | 720 |
| 4366 | Approx, f used to compute achieved CC | | | | | 1.737 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.816 |
| 4367 | Approximate Sample Size needed to achieve specified CC | | | | | 59 | 95% UPL | | | | | 284.5 |
| 4368 | 95% USL | | | | | 720 | 95% KM Chebyshev UPL | | | | | 81.06 |
| 4369 | | | | | | | | | | | | |
| 4370 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 4371 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 4372 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 4373 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 4374 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 4375 | | | | | | | | | | | | |
| 4376 | 4-METHYL-2-PENTANONE | | | | | | | | | | | |
| 4377 | | | | | | | | | | | | |
| 4378 | General Statistics | | | | | | | | | | | |
| 4379 | Total Number of Observations | | | | | 33 | Number of Missing Observations | | | | | 13 |
| 4380 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 4381 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 33 |
| 4382 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4383 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 5 |
| 4384 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 5 |
| 4385 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4386 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4387 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4388 | | | | | | | | | | | | |
| 4389 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4390 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4391 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4392 | | | | | | | | | | | | |
| 4393 | The data set for variable 4-METHYL-2-PENTANONE was not processed! | | | | | | | | | | | |
| 4394 | | | | | | | | | | | | |
| 4395 | | | | | | | | | | | | |
| 4396 | 1,1,1,2-TETRACHLOROETHANE | | | | | | | | | | | |
| 4397 | | | | | | | | | | | | |
| 4398 | General Statistics | | | | | | | | | | | |
| 4399 | Total Number of Observations | | | | | 33 | Number of Missing Observations | | | | | 13 |
| 4400 | Number of Distinct Observations | | | | | 1 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|-----|--------------------------------|---|---|---|---|------|
| 4401 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 33 |
| 4402 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4403 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4404 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4405 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4406 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4407 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4408 | | | | | | | | | | | | |
| 4409 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4410 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4411 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4412 | | | | | | | | | | | | |
| 4413 | The data set for variable 1,1,1,2-TETRACHLOROETHANE was not processed! | | | | | | | | | | | |
| 4414 | | | | | | | | | | | | |
| 4415 | | | | | | | | | | | | |
| 4416 | 1,1,2,2-TETRACHLOROETHANE | | | | | | | | | | | |
| 4417 | | | | | | | | | | | | |
| 4418 | General Statistics | | | | | | | | | | | |
| 4419 | Total Number of Observations | | | | | 33 | Number of Missing Observations | | | | | 13 |
| 4420 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 4421 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 33 |
| 4422 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4423 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4424 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4425 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4426 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4427 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4428 | | | | | | | | | | | | |
| 4429 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4430 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4431 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4432 | | | | | | | | | | | | |
| 4433 | The data set for variable 1,1,2,2-TETRACHLOROETHANE was not processed! | | | | | | | | | | | |
| 4434 | | | | | | | | | | | | |
| 4435 | | | | | | | | | | | | |
| 4436 | 1,1,2-TRICHLOROETHANE | | | | | | | | | | | |
| 4437 | | | | | | | | | | | | |
| 4438 | General Statistics | | | | | | | | | | | |
| 4439 | Total Number of Observations | | | | | 33 | Number of Missing Observations | | | | | 13 |
| 4440 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 4441 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 33 |
| 4442 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4443 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4444 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4445 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4446 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4447 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4448 | | | | | | | | | | | | |
| 4449 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4450 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |

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|------|--|---|---|---|-----|---|---|---|--------------------------------|---|---|---|------|--|--|--|
| 4451 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | | | | | |
| 4452 | | | | | | | | | | | | | | | | |
| 4453 | The data set for variable 1,1,2-TRICHLOROETHANE was not processed! | | | | | | | | | | | | | | | |
| 4454 | | | | | | | | | | | | | | | | |
| 4455 | | | | | | | | | | | | | | | | |
| 4456 | TRICHLOROFLUOROMETHANE | | | | | | | | | | | | | | | |
| 4457 | | | | | | | | | | | | | | | | |
| 4458 | General Statistics | | | | | | | | | | | | | | | |
| 4459 | Total Number of Observations | | | | 33 | | | | Number of Missing Observations | | | | 13 | | | |
| 4460 | Number of Distinct Observations | | | | 1 | | | | | | | | | | | |
| 4461 | Number of Detects | | | | 0 | | | | Number of Non-Detects | | | | 33 | | | |
| 4462 | Number of Distinct Detects | | | | 0 | | | | Number of Distinct Non-Detects | | | | 1 | | | |
| 4463 | Minimum Detect | | | | N/A | | | | Minimum Non-Detect | | | | 1 | | | |
| 4464 | Maximum Detect | | | | N/A | | | | Maximum Non-Detect | | | | 1 | | | |
| 4465 | Variance Detected | | | | N/A | | | | Percent Non-Detects | | | | 100% | | | |
| 4466 | Mean Detected | | | | N/A | | | | SD Detected | | | | N/A | | | |
| 4467 | Mean of Detected Logged Data | | | | N/A | | | | SD of Detected Logged Data | | | | N/A | | | |
| 4468 | | | | | | | | | | | | | | | | |
| 4469 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | | | | | |
| 4470 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | | | | | |
| 4471 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | | | | | |
| 4472 | | | | | | | | | | | | | | | | |
| 4473 | The data set for variable TRICHLOROFLUOROMETHANE was not processed! | | | | | | | | | | | | | | | |
| 4474 | | | | | | | | | | | | | | | | |
| 4475 | | | | | | | | | | | | | | | | |
| 4476 | 1,2,3-TRICHLOROPROPANE | | | | | | | | | | | | | | | |
| 4477 | | | | | | | | | | | | | | | | |
| 4478 | General Statistics | | | | | | | | | | | | | | | |
| 4479 | Total Number of Observations | | | | 33 | | | | Number of Missing Observations | | | | 13 | | | |
| 4480 | Number of Distinct Observations | | | | 1 | | | | | | | | | | | |
| 4481 | Number of Detects | | | | 0 | | | | Number of Non-Detects | | | | 33 | | | |
| 4482 | Number of Distinct Detects | | | | 0 | | | | Number of Distinct Non-Detects | | | | 1 | | | |
| 4483 | Minimum Detect | | | | N/A | | | | Minimum Non-Detect | | | | 2 | | | |
| 4484 | Maximum Detect | | | | N/A | | | | Maximum Non-Detect | | | | 2 | | | |
| 4485 | Variance Detected | | | | N/A | | | | Percent Non-Detects | | | | 100% | | | |
| 4486 | Mean Detected | | | | N/A | | | | SD Detected | | | | N/A | | | |
| 4487 | Mean of Detected Logged Data | | | | N/A | | | | SD of Detected Logged Data | | | | N/A | | | |
| 4488 | | | | | | | | | | | | | | | | |
| 4489 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | | | | | |
| 4490 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | | | | | |
| 4491 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | | | | | |
| 4492 | | | | | | | | | | | | | | | | |
| 4493 | The data set for variable 1,2,3-TRICHLOROPROPANE was not processed! | | | | | | | | | | | | | | | |
| 4494 | | | | | | | | | | | | | | | | |
| 4495 | | | | | | | | | | | | | | | | |
| 4496 | ACETONE | | | | | | | | | | | | | | | |
| 4497 | | | | | | | | | | | | | | | | |
| 4498 | General Statistics | | | | | | | | | | | | | | | |
| 4499 | Total Number of Observations | | | | 31 | | | | Number of Missing Observations | | | | 15 | | | |
| 4500 | Number of Distinct Observations | | | | 4 | | | | | | | | | | | |

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|------|---|---|---|---|---|-------|--|---|---|---|---|--------|
| 4501 | Number of Detects | | | | | 3 | Number of Non-Detects | | | | | 28 |
| 4502 | Number of Distinct Detects | | | | | 3 | Number of Distinct Non-Detects | | | | | 1 |
| 4503 | Minimum Detect | | | | | 11.5 | Minimum Non-Detect | | | | | 10 |
| 4504 | Maximum Detect | | | | | 39.7 | Maximum Non-Detect | | | | | 10 |
| 4505 | Variance Detected | | | | | 252.6 | Percent Non-Detects | | | | | 90.32% |
| 4506 | Mean Detected | | | | | 21.37 | SD Detected | | | | | 15.89 |
| 4507 | Mean of Detected Logged Data | | | | | 2.894 | SD of Detected Logged Data | | | | | 0.685 |
| 4508 | | | | | | | | | | | | |
| 4509 | Warning: Data set has only 3 Detected Values. | | | | | | | | | | | |
| 4510 | This is not enough to compute meaningful or reliable statistics and estimates. | | | | | | | | | | | |
| 4511 | | | | | | | | | | | | |
| 4512 | | | | | | | | | | | | |
| 4513 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 4514 | Tolerance Factor K (For UTL) | | | | | 2.197 | d2max (for USL) | | | | | 2.76 |
| 4515 | | | | | | | | | | | | |
| 4516 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 4517 | Shapiro Wilk Test Statistic | | | | | 0.787 | Shapiro Wilk GOF Test | | | | | |
| 4518 | 5% Shapiro Wilk Critical Value | | | | | 0.767 | Detected Data appear Normal at 5% Significance Level | | | | | |
| 4519 | Lilliefors Test Statistic | | | | | 0.37 | Lilliefors GOF Test | | | | | |
| 4520 | 5% Lilliefors Critical Value | | | | | 0.425 | Detected Data appear Normal at 5% Significance Level | | | | | |
| 4521 | Detected Data appear Normal at 5% Significance Level | | | | | | | | | | | |
| 4522 | | | | | | | | | | | | |
| 4523 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 4524 | KM Mean | | | | | 11.1 | KM SD | | | | | 5.252 |
| 4525 | 95% UTL95% Coverage | | | | | 22.64 | 95% KM UPL (t) | | | | | 20.16 |
| 4526 | 90% KM Percentile (z) | | | | | 17.83 | 95% KM Percentile (z) | | | | | 19.74 |
| 4527 | 99% KM Percentile (z) | | | | | 23.32 | 95% KM USL | | | | | 25.59 |
| 4528 | | | | | | | | | | | | |
| 4529 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 4530 | Mean | | | | | 6.584 | SD | | | | | 6.406 |
| 4531 | 95% UTL95% Coverage | | | | | 20.66 | 95% UPL (t) | | | | | 17.63 |
| 4532 | 90% Percentile (z) | | | | | 14.79 | 95% Percentile (z) | | | | | 17.12 |
| 4533 | 99% Percentile (z) | | | | | 21.49 | 95% USL | | | | | 24.26 |
| 4534 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | |
| 4535 | | | | | | | | | | | | |
| 4536 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | |
| 4537 | Not Enough Data to Perform GOF Test | | | | | | | | | | | |
| 4538 | | | | | | | | | | | | |
| 4539 | Gamma Statistics on Detected Data Only | | | | | | | | | | | |
| 4540 | k hat (MLE) | | | | | 3.13 | k star (bias corrected MLE) | | | | | N/A |
| 4541 | Theta hat (MLE) | | | | | 6.827 | Theta star (bias corrected MLE) | | | | | N/A |
| 4542 | nu hat (MLE) | | | | | 18.78 | nu star (bias corrected) | | | | | N/A |
| 4543 | MLE Mean (bias corrected) | | | | | N/A | | | | | | |
| 4544 | MLE Sd (bias corrected) | | | | | N/A | 95% Percentile of Chisquare (2kstar) | | | | | N/A |
| 4545 | | | | | | | | | | | | |
| 4546 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | |
| 4547 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 4548 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | |
| 4549 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | |
| 4550 | This is especially true when the sample size is small. | | | | | | | | | | | |

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|------|---|---|---|---|-------|---|---|---|-----------------------|---|--------|---|-------|--|-------|--|
| 4551 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | | | | | |
| 4552 | Minimum | | | | 0.01 | | Mean | | | | 2.077 | | | | | |
| 4553 | Maximum | | | | 39.7 | | Median | | | | 0.01 | | | | | |
| 4554 | SD | | | | 7.618 | | CV | | | | 3.668 | | | | | |
| 4555 | k hat (MLE) | | | | 0.164 | | k star (bias corrected MLE) | | | | 0.17 | | | | | |
| 4556 | Theta hat (MLE) | | | | 12.63 | | Theta star (bias corrected MLE) | | | | 12.21 | | | | | |
| 4557 | nu hat (MLE) | | | | 10.2 | | nu star (bias corrected) | | | | 10.54 | | | | | |
| 4558 | MLE Mean (bias corrected) | | | | 2.077 | | MLE Sd (bias corrected) | | | | 5.036 | | | | | |
| 4559 | 95% Percentile of Chisquare (2kstar) | | | | 1.823 | | 90% Percentile | | | | 6.241 | | | | | |
| 4560 | 95% Percentile | | | | 11.13 | | 99% Percentile | | | | 24.98 | | | | | |
| 4561 | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | | | | | | | | |
| 4562 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | | | | |
| 4563 | | | | | WH | | HW | | | | | | WH | | HW | |
| 4564 | 95% Approx. Gamma UTL with 95% Coverage | | | | 9.463 | | 7.818 | | 95% Approx. Gamma UPL | | | | 5.429 | | 4.034 | |
| 4565 | 95% Gamma USL | | | | 16.4 | | 15.23 | | | | | | | | | |
| 4566 | | | | | | | | | | | | | | | | |
| 4567 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | | | | | |
| 4568 | Mean (KM) | | | | 11.1 | | SD (KM) | | | | 5.252 | | | | | |
| 4569 | Variance (KM) | | | | 27.59 | | SE of Mean (KM) | | | | 1.155 | | | | | |
| 4570 | k hat (KM) | | | | 4.466 | | k star (KM) | | | | 4.055 | | | | | |
| 4571 | nu hat (KM) | | | | 276.9 | | nu star (KM) | | | | 251.4 | | | | | |
| 4572 | theta hat (KM) | | | | 2.485 | | theta star (KM) | | | | 2.737 | | | | | |
| 4573 | 80% gamma percentile (KM) | | | | 15.28 | | 90% gamma percentile (KM) | | | | 18.49 | | | | | |
| 4574 | 95% gamma percentile (KM) | | | | 21.44 | | 99% gamma percentile (KM) | | | | 27.74 | | | | | |
| 4575 | | | | | | | | | | | | | | | | |
| 4576 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | | | | | |
| 4577 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | | | | | |
| 4578 | | | | | WH | | HW | | | | | | WH | | HW | |
| 4579 | 95% Approx. Gamma UTL with 95% Coverage | | | | 19.59 | | 19.23 | | 95% Approx. Gamma UPL | | | | 17.37 | | 17.06 | |
| 4580 | 95% KM Gamma Percentile | | | | 17.02 | | 16.72 | | 95% Gamma USL | | | | 22.46 | | 22.06 | |
| 4581 | | | | | | | | | | | | | | | | |
| 4582 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | | | | | |
| 4583 | Shapiro Wilk Test Statistic | | | | 0.819 | | Shapiro Wilk GOF Test | | | | | | | | | |
| 4584 | 5% Shapiro Wilk Critical Value | | | | 0.767 | | Detected Data appear Lognormal at 5% Significance Level | | | | | | | | | |
| 4585 | Lilliefors Test Statistic | | | | 0.355 | | Lilliefors GOF Test | | | | | | | | | |
| 4586 | 5% Lilliefors Critical Value | | | | 0.425 | | Detected Data appear Lognormal at 5% Significance Level | | | | | | | | | |
| 4587 | Detected Data appear Lognormal at 5% Significance Level | | | | | | | | | | | | | | | |
| 4588 | | | | | | | | | | | | | | | | |
| 4589 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | | | | | |
| 4590 | Mean in Original Scale | | | | 2.674 | | Mean in Log Scale | | | | -1.324 | | | | | |
| 4591 | SD in Original Scale | | | | 7.521 | | SD in Log Scale | | | | 2.346 | | | | | |
| 4592 | 95% UTL95% Coverage | | | | 46.12 | | 95% BCA UTL95% Coverage | | | | 26.3 | | | | | |
| 4593 | 95% Bootstrap (%) UTL95% Coverage | | | | 39.7 | | 95% UPL (t) | | | | 15.22 | | | | | |
| 4594 | 90% Percentile (z) | | | | 5.383 | | 95% Percentile (z) | | | | 12.62 | | | | | |
| 4595 | 99% Percentile (z) | | | | 62.47 | | 95% USL | | | | 172.6 | | | | | |
| 4596 | | | | | | | | | | | | | | | | |
| 4597 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | | | | | |
| 4598 | KM Mean of Logged Data | | | | 2.36 | | 95% KM UTL (Lognormal)95% Coverage | | | | 18.2 | | | | | |
| 4599 | KM SD of Logged Data | | | | 0.247 | | 95% KM UPL (Lognormal) | | | | 16.2 | | | | | |
| 4600 | 95% KM Percentile Lognormal (z) | | | | 15.88 | | 95% KM USL (Lognormal) | | | | 20.91 | | | | | |

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| 4601 | | | | | | | | | | | | |
| 4602 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 4603 | Mean in Original Scale | | | | 6.584 | | Mean in Log Scale | | | | 1.734 | |
| 4604 | SD in Original Scale | | | | 6.406 | | SD in Log Scale | | | | 0.425 | |
| 4605 | 95% UTL95% Coverage | | | | 14.39 | | 95% UPL (t) | | | | 11.77 | |
| 4606 | 90% Percentile (z) | | | | 9.755 | | 95% Percentile (z) | | | | 11.38 | |
| 4607 | 99% Percentile (z) | | | | 15.2 | | 95% USL | | | | 18.27 | |
| 4608 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 4609 | | | | | | | | | | | | |
| 4610 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 4611 | Data appear to follow a Discernible Distribution at 5% Significance Level | | | | | | | | | | | |
| 4612 | | | | | | | | | | | | |
| 4613 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 4614 | Order of Statistic, r | | | | 31 | | 95% UTL with95% Coverage | | | | 39.7 | |
| 4615 | Approx, f used to compute achieved CC | | | | 1.632 | | Approximate Actual Confidence Coefficient achieved by UTL | | | | 0.796 | |
| 4616 | Approximate Sample Size needed to achieve specified CC | | | | 59 | | 95% UPL | | | | 23.62 | |
| 4617 | 95% USL | | | | 39.7 | | 95% KM Chebyshev UPL | | | | 34.36 | |
| 4618 | | | | | | | | | | | | |
| 4619 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 4620 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 4621 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 4622 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 4623 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 4624 | | | | | | | | | | | | |
| 4625 | ACRYLONITRILE | | | | | | | | | | | |
| 4626 | | | | | | | | | | | | |
| 4627 | General Statistics | | | | | | | | | | | |
| 4628 | Total Number of Observations | | | | 32 | | Number of Missing Observations | | | | 14 | |
| 4629 | Number of Distinct Observations | | | | 1 | | | | | | | |
| 4630 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 32 | |
| 4631 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 1 | |
| 4632 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 5 | |
| 4633 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 5 | |
| 4634 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 4635 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 4636 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 4637 | | | | | | | | | | | | |
| 4638 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4639 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4640 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4641 | | | | | | | | | | | | |
| 4642 | The data set for variable ACRYLONITRILE was not processed! | | | | | | | | | | | |
| 4643 | | | | | | | | | | | | |
| 4644 | | | | | | | | | | | | |
| 4645 | BROMOCHLOROMETHANE (CHLOROBROMOMETHANE) | | | | | | | | | | | |
| 4646 | | | | | | | | | | | | |
| 4647 | General Statistics | | | | | | | | | | | |
| 4648 | Total Number of Observations | | | | 32 | | Number of Missing Observations | | | | 14 | |
| 4649 | Number of Distinct Observations | | | | 1 | | | | | | | |
| 4650 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 32 | |

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| 4651 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4652 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4653 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4654 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4655 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4656 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4657 | | | | | | | | | | | | |
| 4658 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4659 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4660 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4661 | | | | | | | | | | | | |
| 4662 | The data set for variable BROMOCHLOROMETHANE (CHLOROBROMOMETHANE) was not processed! | | | | | | | | | | | |
| 4663 | | | | | | | | | | | | |
| 4664 | | | | | | | | | | | | |
| 4665 | BROMODICHLOROMETHANE | | | | | | | | | | | |
| 4666 | | | | | | | | | | | | |
| 4667 | General Statistics | | | | | | | | | | | |
| 4668 | Total Number of Observations | | | | | 32 | Number of Missing Observations | | | | | 14 |
| 4669 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 4670 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 32 |
| 4671 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4672 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4673 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4674 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4675 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4676 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4677 | | | | | | | | | | | | |
| 4678 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4679 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4680 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4681 | | | | | | | | | | | | |
| 4682 | The data set for variable BROMODICHLOROMETHANE was not processed! | | | | | | | | | | | |
| 4683 | | | | | | | | | | | | |
| 4684 | | | | | | | | | | | | |
| 4685 | CARBON DISULFIDE | | | | | | | | | | | |
| 4686 | | | | | | | | | | | | |
| 4687 | General Statistics | | | | | | | | | | | |
| 4688 | Total Number of Observations | | | | | 32 | Number of Missing Observations | | | | | 14 |
| 4689 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 4690 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 32 |
| 4691 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4692 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4693 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4694 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4695 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4696 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4697 | | | | | | | | | | | | |
| 4698 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4699 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4700 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 4701 | | | | | | | | | | | | |
| 4702 | The data set for variable CARBON DISULFIDE was not processed! | | | | | | | | | | | |
| 4703 | | | | | | | | | | | | |
| 4704 | | | | | | | | | | | | |
| 4705 | CHLOROFORM | | | | | | | | | | | |
| 4706 | | | | | | | | | | | | |
| 4707 | General Statistics | | | | | | | | | | | |
| 4708 | Total Number of Observations | | | | 32 | | Number of Missing Observations | | | | 14 | |
| 4709 | Number of Distinct Observations | | | | 1 | | | | | | | |
| 4710 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 32 | |
| 4711 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 1 | |
| 4712 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 1 | |
| 4713 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 1 | |
| 4714 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 4715 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 4716 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 4717 | | | | | | | | | | | | |
| 4718 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4719 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4720 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4721 | | | | | | | | | | | | |
| 4722 | The data set for variable CHLOROFORM was not processed! | | | | | | | | | | | |
| 4723 | | | | | | | | | | | | |
| 4724 | | | | | | | | | | | | |
| 4725 | 1,2-DIBROMO-3-CHLOROPROPANE | | | | | | | | | | | |
| 4726 | | | | | | | | | | | | |
| 4727 | General Statistics | | | | | | | | | | | |
| 4728 | Total Number of Observations | | | | 32 | | Number of Missing Observations | | | | 14 | |
| 4729 | Number of Distinct Observations | | | | 1 | | | | | | | |
| 4730 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 32 | |
| 4731 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 1 | |
| 4732 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 7 | |
| 4733 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 7 | |
| 4734 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 4735 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 4736 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 4737 | | | | | | | | | | | | |
| 4738 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4739 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4740 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4741 | | | | | | | | | | | | |
| 4742 | The data set for variable 1,2-DIBROMO-3-CHLOROPROPANE was not processed! | | | | | | | | | | | |
| 4743 | | | | | | | | | | | | |
| 4744 | | | | | | | | | | | | |
| 4745 | TRANS-1,4-DICHLORO-2-BUTENE | | | | | | | | | | | |
| 4746 | | | | | | | | | | | | |
| 4747 | General Statistics | | | | | | | | | | | |
| 4748 | Total Number of Observations | | | | 32 | | Number of Missing Observations | | | | 14 | |
| 4749 | Number of Distinct Observations | | | | 2 | | | | | | | |
| 4750 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 32 | |

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| 4751 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 2 |
| 4752 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 2 |
| 4753 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 3 |
| 4754 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4755 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4756 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4757 | | | | | | | | | | | | |
| 4758 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4759 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4760 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4761 | | | | | | | | | | | | |
| 4762 | The data set for variable TRANS-1,4-DICHLORO-2-BUTENE was not processed! | | | | | | | | | | | |
| 4763 | | | | | | | | | | | | |
| 4764 | | | | | | | | | | | | |
| 4765 | 2-HEXANONE | | | | | | | | | | | |
| 4766 | | | | | | | | | | | | |
| 4767 | General Statistics | | | | | | | | | | | |
| 4768 | Total Number of Observations | | | | | 32 | Number of Missing Observations | | | | | 14 |
| 4769 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 4770 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 32 |
| 4771 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4772 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 5 |
| 4773 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 5 |
| 4774 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4775 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4776 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4777 | | | | | | | | | | | | |
| 4778 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4779 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4780 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4781 | | | | | | | | | | | | |
| 4782 | The data set for variable 2-HEXANONE was not processed! | | | | | | | | | | | |
| 4783 | | | | | | | | | | | | |
| 4784 | | | | | | | | | | | | |
| 4785 | DIBROMOMETHANE | | | | | | | | | | | |
| 4786 | | | | | | | | | | | | |
| 4787 | General Statistics | | | | | | | | | | | |
| 4788 | Total Number of Observations | | | | | 32 | Number of Missing Observations | | | | | 14 |
| 4789 | Number of Distinct Observations | | | | | 1 | | | | | | |
| 4790 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 32 |
| 4791 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4792 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 1 |
| 4793 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 1 |
| 4794 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4795 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4796 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4797 | | | | | | | | | | | | |
| 4798 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4799 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4800 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |

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| 4801 | | | | | | | | | | | | |
| 4802 | The data set for variable DIBROMOMETHANE was not processed! | | | | | | | | | | | |
| 4803 | | | | | | | | | | | | |
| 4804 | | | | | | | | | | | | |
| 4805 | IODOMETHANE | | | | | | | | | | | |
| 4806 | | | | | | | | | | | | |
| 4807 | General Statistics | | | | | | | | | | | |
| 4808 | Total Number of Observations | | | | 32 | | Number of Missing Observations | | | | 14 | |
| 4809 | Number of Distinct Observations | | | | 1 | | | | | | | |
| 4810 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 32 | |
| 4811 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 1 | |
| 4812 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 1 | |
| 4813 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 1 | |
| 4814 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 4815 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 4816 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 4817 | | | | | | | | | | | | |
| 4818 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4819 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4820 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4821 | | | | | | | | | | | | |
| 4822 | The data set for variable IODOMETHANE was not processed! | | | | | | | | | | | |
| 4823 | | | | | | | | | | | | |
| 4824 | | | | | | | | | | | | |
| 4825 | STYRENE | | | | | | | | | | | |
| 4826 | | | | | | | | | | | | |
| 4827 | General Statistics | | | | | | | | | | | |
| 4828 | Total Number of Observations | | | | 32 | | Number of Missing Observations | | | | 14 | |
| 4829 | Number of Distinct Observations | | | | 1 | | | | | | | |
| 4830 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 32 | |
| 4831 | Number of Distinct Detects | | | | 0 | | Number of Distinct Non-Detects | | | | 1 | |
| 4832 | Minimum Detect | | | | N/A | | Minimum Non-Detect | | | | 1 | |
| 4833 | Maximum Detect | | | | N/A | | Maximum Non-Detect | | | | 1 | |
| 4834 | Variance Detected | | | | N/A | | Percent Non-Detects | | | | 100% | |
| 4835 | Mean Detected | | | | N/A | | SD Detected | | | | N/A | |
| 4836 | Mean of Detected Logged Data | | | | N/A | | SD of Detected Logged Data | | | | N/A | |
| 4837 | | | | | | | | | | | | |
| 4838 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4839 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4840 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4841 | | | | | | | | | | | | |
| 4842 | The data set for variable STYRENE was not processed! | | | | | | | | | | | |
| 4843 | | | | | | | | | | | | |
| 4844 | | | | | | | | | | | | |
| 4845 | VINYL ACETATE | | | | | | | | | | | |
| 4846 | | | | | | | | | | | | |
| 4847 | General Statistics | | | | | | | | | | | |
| 4848 | Total Number of Observations | | | | 32 | | Number of Missing Observations | | | | 14 | |
| 4849 | Number of Distinct Observations | | | | 1 | | | | | | | |
| 4850 | Number of Detects | | | | 0 | | Number of Non-Detects | | | | 32 | |

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|------|---|---|---|---|---|-----|--------------------------------|---|---|---|---|--------|
| 4851 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 1 |
| 4852 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 5 |
| 4853 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 5 |
| 4854 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4855 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4856 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4857 | | | | | | | | | | | | |
| 4858 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4859 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4860 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4861 | | | | | | | | | | | | |
| 4862 | The data set for variable VINYL ACETATE was not processed! | | | | | | | | | | | |
| 4863 | | | | | | | | | | | | |
| 4864 | | | | | | | | | | | | |
| 4865 | ANTIMONY | | | | | | | | | | | |
| 4866 | | | | | | | | | | | | |
| 4867 | General Statistics | | | | | | | | | | | |
| 4868 | Total Number of Observations | | | | | 10 | Number of Missing Observations | | | | | 36 |
| 4869 | Number of Distinct Observations | | | | | 3 | | | | | | |
| 4870 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 10 |
| 4871 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 3 |
| 4872 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 0.0022 |
| 4873 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 0.03 |
| 4874 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4875 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4876 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4877 | | | | | | | | | | | | |
| 4878 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4879 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4880 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |
| 4881 | | | | | | | | | | | | |
| 4882 | The data set for variable ANTIMONY was not processed! | | | | | | | | | | | |
| 4883 | | | | | | | | | | | | |
| 4884 | | | | | | | | | | | | |
| 4885 | BERYLLIUM | | | | | | | | | | | |
| 4886 | | | | | | | | | | | | |
| 4887 | General Statistics | | | | | | | | | | | |
| 4888 | Total Number of Observations | | | | | 10 | Number of Missing Observations | | | | | 36 |
| 4889 | Number of Distinct Observations | | | | | 3 | | | | | | |
| 4890 | Number of Detects | | | | | 0 | Number of Non-Detects | | | | | 10 |
| 4891 | Number of Distinct Detects | | | | | 0 | Number of Distinct Non-Detects | | | | | 3 |
| 4892 | Minimum Detect | | | | | N/A | Minimum Non-Detect | | | | | 0.0011 |
| 4893 | Maximum Detect | | | | | N/A | Maximum Non-Detect | | | | | 0.0044 |
| 4894 | Variance Detected | | | | | N/A | Percent Non-Detects | | | | | 100% |
| 4895 | Mean Detected | | | | | N/A | SD Detected | | | | | N/A |
| 4896 | Mean of Detected Logged Data | | | | | N/A | SD of Detected Logged Data | | | | | N/A |
| 4897 | | | | | | | | | | | | |
| 4898 | Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! | | | | | | | | | | | |
| 4899 | Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! | | | | | | | | | | | |
| 4900 | The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV). | | | | | | | | | | | |

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| 4901 | | | | | | | | | | | | |
| 4902 | The data set for variable BERYLLIUM was not processed! | | | | | | | | | | | |
| 4903 | | | | | | | | | | | | |
| 4904 | | | | | | | | | | | | |
| 4905 | COBALT | | | | | | | | | | | |
| 4906 | | | | | | | | | | | | |
| 4907 | General Statistics | | | | | | | | | | | |
| 4908 | Total Number of Observations | | | | 10 | | Number of Missing Observations | | | | 36 | |
| 4909 | Number of Distinct Observations | | | | 6 | | | | | | | |
| 4910 | Number of Detects | | | | 9 | | Number of Non-Detects | | | | 1 | |
| 4911 | Number of Distinct Detects | | | | 5 | | Number of Distinct Non-Detects | | | | 1 | |
| 4912 | Minimum Detect | | | | 0.0096 | | Minimum Non-Detect | | | | 0.0056 | |
| 4913 | Maximum Detect | | | | 0.05 | | Maximum Non-Detect | | | | 0.0056 | |
| 4914 | Variance Detected | | | | 1.8702E-4 | | Percent Non-Detects | | | | 10% | |
| 4915 | Mean Detected | | | | 0.0188 | | SD Detected | | | | 0.0137 | |
| 4916 | Mean of Detected Logged Data | | | | -4.155 | | SD of Detected Logged Data | | | | 0.606 | |
| 4917 | | | | | | | | | | | | |
| 4918 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 4919 | Tolerance Factor K (For UTL) | | | | 2.911 | | d2max (for USL) | | | | 2.176 | |
| 4920 | | | | | | | | | | | | |
| 4921 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 4922 | Shapiro Wilk Test Statistic | | | | 0.737 | | Shapiro Wilk GOF Test | | | | | |
| 4923 | 5% Shapiro Wilk Critical Value | | | | 0.829 | | Data Not Normal at 5% Significance Level | | | | | |
| 4924 | Lilliefors Test Statistic | | | | 0.297 | | Lilliefors GOF Test | | | | | |
| 4925 | 5% Lilliefors Critical Value | | | | 0.274 | | Data Not Normal at 5% Significance Level | | | | | |
| 4926 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 4927 | | | | | | | | | | | | |
| 4928 | Kaplan Meier (KM) Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 4929 | KM Mean | | | | 0.0175 | | KM SD | | | | 0.0129 | |
| 4930 | 95% UTL95% Coverage | | | | 0.055 | | 95% KM UPL (t) | | | | 0.0422 | |
| 4931 | 90% KM Percentile (z) | | | | 0.034 | | 95% KM Percentile (z) | | | | 0.0387 | |
| 4932 | 99% KM Percentile (z) | | | | 0.0474 | | 95% KM USL | | | | 0.0455 | |
| 4933 | | | | | | | | | | | | |
| 4934 | DL/2 Substitution Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 4935 | Mean | | | | 0.0172 | | SD | | | | 0.0139 | |
| 4936 | 95% UTL95% Coverage | | | | 0.0576 | | 95% UPL (t) | | | | 0.0439 | |
| 4937 | 90% Percentile (z) | | | | 0.035 | | 95% Percentile (z) | | | | 0.04 | |
| 4938 | 99% Percentile (z) | | | | 0.0495 | | 95% USL | | | | 0.0474 | |
| 4939 | DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons | | | | | | | | | | | |
| 4940 | | | | | | | | | | | | |
| 4941 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | |
| 4942 | A-D Test Statistic | | | | 0.928 | | Anderson-Darling GOF Test | | | | | |
| 4943 | 5% A-D Critical Value | | | | 0.727 | | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 4944 | K-S Test Statistic | | | | 0.334 | | Kolmogorov-Smirnov GOF | | | | | |
| 4945 | 5% K-S Critical Value | | | | 0.281 | | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 4946 | Data Not Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 4947 | | | | | | | | | | | | |
| 4948 | Gamma Statistics on Detected Data Only | | | | | | | | | | | |
| 4949 | k hat (MLE) | | | | 2.885 | | k star (bias corrected MLE) | | | | 1.997 | |
| 4950 | Theta hat (MLE) | | | | 0.00653 | | Theta star (bias corrected MLE) | | | | 0.00944 | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|-----------|--------|---|---|---|--------|---------|
| 4951 | | | | | nu hat (MLE) | 51.92 | | | | nu star (bias corrected) | | 35.95 |
| 4952 | | | | | MLE Mean (bias corrected) | 0.0188 | | | | | | |
| 4953 | | | | | MLE Sd (bias corrected) | 0.0133 | | | | 95% Percentile of Chisquare (2kstar) | | 9.478 |
| 4954 | | | | | | | | | | | | |
| 4955 | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | | | | | |
| 4956 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 4957 | GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20) | | | | | | | | | | | |
| 4958 | For such situations, GROS method may yield incorrect values of UCLs and BTVs | | | | | | | | | | | |
| 4959 | This is especially true when the sample size is small. | | | | | | | | | | | |
| 4960 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 4961 | | | | | Minimum | 0.0096 | | | | Mean | | 0.018 |
| 4962 | | | | | Maximum | 0.05 | | | | Median | | 0.01 |
| 4963 | | | | | SD | 0.0132 | | | | CV | | 0.735 |
| 4964 | | | | | k hat (MLE) | 2.931 | | | | k star (bias corrected MLE) | | 2.118 |
| 4965 | | | | | Theta hat (MLE) | 0.00613 | | | | Theta star (bias corrected MLE) | | 0.00848 |
| 4966 | | | | | nu hat (MLE) | 58.61 | | | | nu star (bias corrected) | | 42.36 |
| 4967 | | | | | MLE Mean (bias corrected) | 0.018 | | | | MLE Sd (bias corrected) | | 0.0123 |
| 4968 | | | | | 95% Percentile of Chisquare (2kstar) | 9.868 | | | | 90% Percentile | | 0.0345 |
| 4969 | | | | | 95% Percentile | 0.0418 | | | | 99% Percentile | | 0.0581 |
| 4970 | The following statistics are computed using Gamma ROS Statistics on Imputed Data | | | | | | | | | | | |
| 4971 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | |
| 4972 | | | | | WH | HW | | | | WH | HW | |
| 4973 | | | | | 95% Approx. Gamma UTL with 95% Coverage | 0.0677 | 0.0705 | | | 95% Approx. Gamma UPL | 0.0445 | 0.0449 |
| 4974 | | | | | 95% Gamma USL | 0.0499 | 0.0507 | | | | | |
| 4975 | | | | | | | | | | | | |
| 4976 | Estimates of Gamma Parameters using KM Estimates | | | | | | | | | | | |
| 4977 | | | | | Mean (KM) | 0.0175 | | | | SD (KM) | | 0.0129 |
| 4978 | | | | | Variance (KM) | 1.6540E-4 | | | | SE of Mean (KM) | | 0.00431 |
| 4979 | | | | | k hat (KM) | 1.856 | | | | k star (KM) | | 1.366 |
| 4980 | | | | | nu hat (KM) | 37.12 | | | | nu star (KM) | | 27.31 |
| 4981 | | | | | theta hat (KM) | 0.00944 | | | | theta star (KM) | | 0.0128 |
| 4982 | | | | | 80% gamma percentile (KM) | 0.0274 | | | | 90% gamma percentile (KM) | | 0.0374 |
| 4983 | | | | | 95% gamma percentile (KM) | 0.0471 | | | | 99% gamma percentile (KM) | | 0.0693 |
| 4984 | | | | | | | | | | | | |
| 4985 | The following statistics are computed using gamma distribution and KM estimates | | | | | | | | | | | |
| 4986 | Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods | | | | | | | | | | | |
| 4987 | | | | | WH | HW | | | | WH | HW | |
| 4988 | | | | | 95% Approx. Gamma UTL with 95% Coverage | 0.0673 | 0.0706 | | | 95% Approx. Gamma UPL | 0.0439 | 0.0444 |
| 4989 | | | | | 95% KM Gamma Percentile | 0.0384 | 0.0386 | | | 95% Gamma USL | 0.0492 | 0.0503 |
| 4990 | | | | | | | | | | | | |
| 4991 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | |
| 4992 | | | | | Shapiro Wilk Test Statistic | 0.799 | | | | Shapiro Wilk GOF Test | | |
| 4993 | | | | | 5% Shapiro Wilk Critical Value | 0.829 | | | | Data Not Lognormal at 5% Significance Level | | |
| 4994 | | | | | Lilliefors Test Statistic | 0.327 | | | | Lilliefors GOF Test | | |
| 4995 | | | | | 5% Lilliefors Critical Value | 0.274 | | | | Data Not Lognormal at 5% Significance Level | | |
| 4996 | Data Not Lognormal at 5% Significance Level | | | | | | | | | | | |
| 4997 | | | | | | | | | | | | |
| 4998 | Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects | | | | | | | | | | | |
| 4999 | | | | | Mean in Original Scale | 0.0173 | | | | Mean in Log Scale | | -4.295 |
| 5000 | | | | | SD in Original Scale | 0.0137 | | | | SD in Log Scale | | 0.723 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|--|---|---|---|---|--------|---|---|---|---|---|--------|
| 5001 | 95% UTL95% Coverage | | | | | 0.112 | 95% BCA UTL95% Coverage | | | | | 0.05 |
| 5002 | 95% Bootstrap (%) UTL95% Coverage | | | | | 0.05 | 95% UPL (t) | | | | | 0.0547 |
| 5003 | 90% Percentile (z) | | | | | 0.0344 | 95% Percentile (z) | | | | | 0.0448 |
| 5004 | 99% Percentile (z) | | | | | 0.0732 | 95% USL | | | | | 0.0657 |
| 5005 | | | | | | | | | | | | |
| 5006 | Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution | | | | | | | | | | | |
| 5007 | KM Mean of Logged Data | | | | | -4.258 | 95% KM UTL (Lognormal)95% Coverage | | | | | 0.087 |
| 5008 | KM SD of Logged Data | | | | | 0.624 | 95% KM UPL (Lognormal) | | | | | 0.0469 |
| 5009 | 95% KM Percentile Lognormal (z) | | | | | 0.0395 | 95% KM USL (Lognormal) | | | | | 0.055 |
| 5010 | | | | | | | | | | | | |
| 5011 | Background DL/2 Statistics Assuming Lognormal Distribution | | | | | | | | | | | |
| 5012 | Mean in Original Scale | | | | | 0.0172 | Mean in Log Scale | | | | | -4.327 |
| 5013 | SD in Original Scale | | | | | 0.0139 | SD in Log Scale | | | | | 0.789 |
| 5014 | 95% UTL95% Coverage | | | | | 0.131 | 95% UPL (t) | | | | | 0.0602 |
| 5015 | 90% Percentile (z) | | | | | 0.0363 | 95% Percentile (z) | | | | | 0.0484 |
| 5016 | 99% Percentile (z) | | | | | 0.0828 | 95% USL | | | | | 0.0736 |
| 5017 | DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons. | | | | | | | | | | | |
| 5018 | | | | | | | | | | | | |
| 5019 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 5020 | Data do not follow a Discernible Distribution (0.05) | | | | | | | | | | | |
| 5021 | | | | | | | | | | | | |
| 5022 | Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects) | | | | | | | | | | | |
| 5023 | Order of Statistic, r | | | | | 10 | 95% UTL with95% Coverage | | | | | 0.05 |
| 5024 | Approx, f used to compute achieved CC | | | | | 0.526 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.401 |
| 5025 | Approximate Sample Size needed to achieve specified CC | | | | | 59 | 95% UPL | | | | | 0.05 |
| 5026 | 95% USL | | | | | 0.05 | 95% KM Chebyshev UPL | | | | | 0.0763 |
| 5027 | | | | | | | | | | | | |
| 5028 | Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. | | | | | | | | | | | |
| 5029 | Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers | | | | | | | | | | | |
| 5030 | and consists of observations collected from clean unimpacted locations. | | | | | | | | | | | |
| 5031 | The use of USL tends to provide a balance between false positives and false negatives provided the data | | | | | | | | | | | |
| 5032 | represents a background data set and when many onsite observations need to be compared with the BTV. | | | | | | | | | | | |
| 5033 | | | | | | | | | | | | |
| 5034 | NICKEL | | | | | | | | | | | |
| 5035 | | | | | | | | | | | | |
| 5036 | General Statistics | | | | | | | | | | | |
| 5037 | Total Number of Observations | | | | | 10 | Number of Distinct Observations | | | | | 6 |
| 5038 | | | | | | | Number of Missing Observations | | | | | 36 |
| 5039 | Minimum | | | | | 0.01 | First Quartile | | | | | 0.02 |
| 5040 | Second Largest | | | | | 0.06 | Median | | | | | 0.03 |
| 5041 | Maximum | | | | | 0.14 | Third Quartile | | | | | 0.045 |
| 5042 | Mean | | | | | 0.04 | SD | | | | | 0.0386 |
| 5043 | Coefficient of Variation | | | | | 0.965 | Skewness | | | | | 2.263 |
| 5044 | Mean of logged Data | | | | | -3.533 | SD of logged Data | | | | | 0.806 |
| 5045 | | | | | | | | | | | | |
| 5046 | Critical Values for Background Threshold Values (BTVs) | | | | | | | | | | | |
| 5047 | Tolerance Factor K (For UTL) | | | | | 2.911 | d2max (for USL) | | | | | 2.176 |
| 5048 | | | | | | | | | | | | |
| 5049 | Normal GOF Test | | | | | | | | | | | |
| 5050 | Shapiro Wilk Test Statistic | | | | | 0.727 | Shapiro Wilk GOF Test | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|------|---|---|---|---|---|-------|---|---|---|---|---|--------|
| 5051 | 5% Shapiro Wilk Critical Value | | | | | 0.842 | Data Not Normal at 5% Significance Level | | | | | |
| 5052 | Lilliefors Test Statistic | | | | | 0.302 | Lilliefors GOF Test | | | | | |
| 5053 | 5% Lilliefors Critical Value | | | | | 0.262 | Data Not Normal at 5% Significance Level | | | | | |
| 5054 | Data Not Normal at 5% Significance Level | | | | | | | | | | | |
| 5055 | | | | | | | | | | | | |
| 5056 | Background Statistics Assuming Normal Distribution | | | | | | | | | | | |
| 5057 | 95% UTL with 95% Coverage | | | | | 0.152 | 90% Percentile (z) | | | | | 0.0895 |
| 5058 | 95% UPL (t) | | | | | 0.114 | 95% Percentile (z) | | | | | 0.103 |
| 5059 | 95% USL | | | | | 0.124 | 99% Percentile (z) | | | | | 0.13 |
| 5060 | | | | | | | | | | | | |
| 5061 | Gamma GOF Test | | | | | | | | | | | |
| 5062 | A-D Test Statistic | | | | | 0.449 | Anderson-Darling Gamma GOF Test | | | | | |
| 5063 | 5% A-D Critical Value | | | | | 0.737 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 5064 | K-S Test Statistic | | | | | 0.241 | Kolmogorov-Smirnov Gamma GOF Test | | | | | |
| 5065 | 5% K-S Critical Value | | | | | 0.27 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 5066 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 5067 | | | | | | | | | | | | |
| 5068 | Gamma Statistics | | | | | | | | | | | |
| 5069 | k hat (MLE) | | | | | 1.74 | k star (bias corrected MLE) | | | | | 1.285 |
| 5070 | Theta hat (MLE) | | | | | 0.023 | Theta star (bias corrected MLE) | | | | | 0.0311 |
| 5071 | nu hat (MLE) | | | | | 34.8 | nu star (bias corrected) | | | | | 25.7 |
| 5072 | MLE Mean (bias corrected) | | | | | 0.04 | MLE Sd (bias corrected) | | | | | 0.0353 |
| 5073 | | | | | | | | | | | | |
| 5074 | Background Statistics Assuming Gamma Distribution | | | | | | | | | | | |
| 5075 | 95% Wilson Hilferty (WH) Approx. Gamma UPL | | | | | 0.12 | 90% Percentile | | | | | 0.0866 |
| 5076 | 95% Hawkins Wixley (HW) Approx. Gamma UPL | | | | | 0.122 | 95% Percentile | | | | | 0.11 |
| 5077 | 95% WH Approx. Gamma UTL with 95% Coverage | | | | | 0.198 | 99% Percentile | | | | | 0.163 |
| 5078 | 95% HW Approx. Gamma UTL with 95% Coverage | | | | | 0.213 | | | | | | |
| 5079 | 95% WH USL | | | | | 0.137 | 95% HW USL | | | | | 0.142 |
| 5080 | | | | | | | | | | | | |
| 5081 | Lognormal GOF Test | | | | | | | | | | | |
| 5082 | Shapiro Wilk Test Statistic | | | | | 0.944 | Shapiro Wilk Lognormal GOF Test | | | | | |
| 5083 | 5% Shapiro Wilk Critical Value | | | | | 0.842 | Data appear Lognormal at 5% Significance Level | | | | | |
| 5084 | Lilliefors Test Statistic | | | | | 0.187 | Lilliefors Lognormal GOF Test | | | | | |
| 5085 | 5% Lilliefors Critical Value | | | | | 0.262 | Data appear Lognormal at 5% Significance Level | | | | | |
| 5086 | Data appear Lognormal at 5% Significance Level | | | | | | | | | | | |
| 5087 | | | | | | | | | | | | |
| 5088 | Background Statistics assuming Lognormal Distribution | | | | | | | | | | | |
| 5089 | 95% UTL with 95% Coverage | | | | | 0.305 | 90% Percentile (z) | | | | | 0.0821 |
| 5090 | 95% UPL (t) | | | | | 0.138 | 95% Percentile (z) | | | | | 0.11 |
| 5091 | 95% USL | | | | | 0.169 | 99% Percentile (z) | | | | | 0.191 |
| 5092 | | | | | | | | | | | | |
| 5093 | Nonparametric Distribution Free Background Statistics | | | | | | | | | | | |
| 5094 | Data appear Gamma Distributed at 5% Significance Level | | | | | | | | | | | |
| 5095 | | | | | | | | | | | | |
| 5096 | Nonparametric Upper Limits for Background Threshold Values | | | | | | | | | | | |
| 5097 | Order of Statistic, r | | | | | 10 | 95% UTL with 95% Coverage | | | | | 0.14 |
| 5098 | Approx, f used to compute achieved CC | | | | | 0.526 | Approximate Actual Confidence Coefficient achieved by UTL | | | | | 0.401 |
| 5099 | | | | | | | Approximate Sample Size needed to achieve specified CC | | | | | 59 |
| 5100 | 95% Percentile Bootstrap UTL with 95% Coverage | | | | | 0.14 | 95% BCA Bootstrap UTL with 95% Coverage | | | | | 0.14 |



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP015W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 36.43 " Longitude: 76 ° 27 ' 10.82 "

Depth to Water Level: 60.82 ft Measured from: Land Surface TOC

Casing Stickup: 1.90 ft Elevation of Water Level: 515.58 ft./MSL

Sampling Depth: 135 ft Volume of Water Column: 129.36 gal

Total Well Depth: 148.9 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 1.0

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/18/2020 Sample Collection Time: 10:13

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3102944001 Final Lab Analysis Completion Date: 5/24/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments:

I.D. No 101389

Monitoring Point No. FFMP015W

Sample Date 5/18/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.1 ND | SM20-4500D |
| BICARBONATE ALKALINITY | 20 | SM20-2320B |
| CALCIUM, TOTAL | 21.7 | SW846 6010B |
| CALCIUM, DISSOLVED | 22.3 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 31.2 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 56 ND | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 24.9 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 24.4 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 33 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 32 | SW846 6010B |
| NITRATE-NITROGEN | 35.9 | EPA 300 |
| pH-FIELD (SU) | 5.43 | FIELD |
| pH-LAB (SU) | 6.33 | SM20-4500B |
| POTASSIUM, TOTAL | 2.5 | SW846 6010B |
| POTASSIUM, DISSOLVED | 2.5 | SW846 6010B |
| SODIUM, TOTAL | 26 | SW846 6010B |
| SODIUM, DISSOLVED | 24.9 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 556 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 503 | EPA 120.1 |
| SULFATE | 24.6 | EPA 300 |
| ALKALINITY | 20 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 344 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 1.2 | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 0.1 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP015W

Sample Date 5/18/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------|------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP015W

Sample Date 5/18/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 85 | SW846 6010B |
| BARIUM, DISSOLVED | 88 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 31 | SW846 6010B |
| ZINC, DISSOLVED | 34 | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP015W

Sample Date 5/18/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------|------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

| | |
|----------------------|-----------|
| I.D. No | 101389 |
| Monitoring Point No. | FFMP015W |
| Sample Date | 5/18/2020 |

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 5.9 | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.



**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT**

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

**FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP033W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 31.09 " Longitude: 76 ° 27 ' 4.98 "

Depth to Water Level: 17.91 ft Measured from: Land Surface TOC

Casing Stickup: 0.49 ft Elevation of Water Level: 498.61 ft./MSL

Sampling Depth: 79 ft Volume of Water Column: 114.69 gal

Total Well Depth: 96 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 0.9

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/18/2020 Sample Collection Time: 11:30

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3102944002 Final Lab Analysis Completion Date: 5/24/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments: _____

I.D. No 101389

Monitoring Point No. FFMP033W

Sample Date 5/18/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.695 | SM20-4500D |
| BICARBONATE ALKALINITY | 42 | SM20-2320B |
| CALCIUM, TOTAL | 25.3 | SW846 6010B |
| CALCIUM, DISSOLVED | 24.5 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 40.4 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 5500 | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 5300 | SW846 6010B |
| MAGNESIUM, TOTAL | 9 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 8.8 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 410 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 390 | SW846 6010B |
| NITRATE-NITROGEN | 10.8 | EPA 300 |
| pH-FIELD (SU) | 5.8 | FIELD |
| pH-LAB (SU) | 6.77 | SM20-4500B |
| POTASSIUM, TOTAL | 1.5 | SW846 6010B |
| POTASSIUM, DISSOLVED | 1.5 | SW846 6010B |
| SODIUM, TOTAL | 13.6 | SW846 6010B |
| SODIUM, DISSOLVED | 13.3 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 384 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 334 | EPA 120.1 |
| SULFATE | 6.2 | EPA 300 |
| ALKALINITY | 42 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 220 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 0.68 | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 6.09 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP033W

Sample Date 5/18/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------|---------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP033W

Sample Date 5/18/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 46 | SW846 6010B |
| BARIUM, DISSOLVED | 48 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 5.6 ND | SW846 6010B |
| ZINC, DISSOLVED | 5.6 ND | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP033W

Sample Date 5/18/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------------|-----------------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP033W

Sample Date 5/18/2020

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 5.6 ND | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP028W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 37 ° 57 ' 21.62 " Longitude: 76 ° 27 ' 0.1 "

Depth to Water Level: 10.59 ft Measured from: Land Surface TOC

Casing Stickup: 2.50 ft Elevation of Water Level: 454.41 ft./MSL

Sampling Depth: 50 ft Volume of Water Column: _____ gal

Total Well Depth: 60 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 2.4

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 5/18/2020 Sample Collection Time: 14:34

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3102944003 Final Lab Analysis Completion Date: 5/24/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments: _____

I.D. No 101389

Monitoring Point No. FFMP028W

Sample Date 5/18/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.1 ND | SM20-4500D |
| BICARBONATE ALKALINITY | 27 | SM20-2320B |
| CALCIUM, TOTAL | 36.5 | SW846 6010B |
| CALCIUM, DISSOLVED | 37.2 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 84.7 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 56 ND | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 16.7 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 17.1 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 7.3 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 10 | SW846 6010B |
| NITRATE-NITROGEN | 16.3 | EPA 300 |
| pH-FIELD (SU) | 5.48 | FIELD |
| pH-LAB (SU) | 6.52 | SM20-4500B |
| POTASSIUM, TOTAL | 2.1 | SW846 6010B |
| POTASSIUM, DISSOLVED | 2.1 | SW846 6010B |
| SODIUM, TOTAL | 26.6 | SW846 6010B |
| SODIUM, DISSOLVED | 27.2 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 575 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 545 | EPA 120.1 |
| SULFATE | 24.3 | EPA 300 |
| ALKALINITY | 27 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 378 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 1.3 | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 0.16 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP028W

Sample Date 5/18/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------|---------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP028W

Sample Date 5/18/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 63 | SW846 6010B |
| BARIUM, DISSOLVED | 65 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 11 | SW846 6010B |
| ZINC, DISSOLVED | 12 | SW846 6010B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP028W

Sample Date 5/18/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------|------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

| | |
|----------------------|-----------|
| I.D. No | 101389 |
| Monitoring Point No. | FFMP028W |
| Sample Date | 5/18/2020 |

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 5.6 ND | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.

| | |
|----------------------|-----------|
| I.D. No | 101389 |
| Monitoring Point No. | FFMP028W |
| Sample Date | 5/18/2020 |

FORM 19 ANNUAL WATER QUALITY ANALYSES

Qualitatively Identified Organic Compounds

List at least ten volatile organic compounds not otherwise identified in this section. Their identification should be based upon those compounds showing the greatest apparent concentration from the peaks of a mass spectrum of each sample. These ten compounds shall be identified but the concentration of each is not required.

| <u>Constituent</u> | <u>CAS Number</u> |
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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP017W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 8.5 " Longitude: 76 ° 27 ' 6.17 "

Depth to Water Level: 39.42 ft Measured from: Land Surface TOC

Casing Stickup: 2.00 ft Elevation of Water Level: 441.28 ft./MSL

Sampling Depth: 135 ft Volume of Water Column: 163.14 gal

Total Well Depth: 150.5 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 1.2

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/19/2020 Sample Collection Time: 9:39

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3103148001 Final Lab Analysis Completion Date: 6/10/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments:

I.D. No 101389

Monitoring Point No. FFMP017W

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.312 | SM20-4500D |
| BICARBONATE ALKALINITY | 79 | SM20-2320B |
| CALCIUM, TOTAL | 95.2 | SW846 6010B |
| CALCIUM, DISSOLVED | 103 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 355 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 56 ND | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 42.2 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 42.9 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 2500 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 2600 | SW846 6010B |
| NITRATE-NITROGEN | 1.5 | EPA 300 |
| pH-FIELD (SU) | 5.89 | FIELD |
| pH-LAB (SU) | 6.73 | SM20-4500B |
| POTASSIUM, TOTAL | 7.3 | SW846 6010B |
| POTASSIUM, DISSOLVED | 7.5 | SW846 6010B |
| SODIUM, TOTAL | 96.7 | SW846 6010B |
| SODIUM, DISSOLVED | 96.6 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 1523 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 1500 | EPA 120.1 |
| SULFATE | 72.9 | EPA 300 |
| ALKALINITY | 79 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 1140 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 2.9 | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 0.44 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP017W

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------|------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP017W

Sample Date 5/19/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 130 | SW846 6010B |
| BARIUM, DISSOLVED | 140 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 11 | SW846 6010B |
| ZINC, DISSOLVED | 9.3 | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP017W

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------------|-----------------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

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|----------------------|-----------|
| I.D. No | 101389 |
| Monitoring Point No. | FFMP017W |
| Sample Date | 5/19/2020 |

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 55 | SW846 6010B |
| NICKEL | 9.2 | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.

| | |
|----------------------|-----------|
| I.D. No | 101389 |
| Monitoring Point No. | FFMP017W |
| Sample Date | 5/19/2020 |

FORM 19

ANNUAL WATER QUALITY ANALYSES

Qualitatively Identified Organic Compounds

List at least ten volatile organic compounds not otherwise identified in this section. Their identification should be based upon those compounds showing the greatest apparent concentration from the peaks of a mass spectrum of each sample. These ten compounds shall be identified but the concentration of each is not required.

| <u>Constituent</u> | <u>CAS Number</u> |
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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP029W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 12.93 " Longitude: 76 ° 27 ' 0.67 "

Depth to Water Level: 37.22 ft Measured from: Land Surface TOC

Casing Stickup: 2.00 ft Elevation of Water Level: 440.08 ft./MSL

Sampling Depth: 55 ft Volume of Water Column: 31.25 gal

Total Well Depth: 58.5 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 3.3

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/19/2020 Sample Collection Time: 11:02

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3103148002 Final Lab Analysis Completion Date: 5/28/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments:

I.D. No 101389

Monitoring Point No. FFMP029W

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.1 ND | SM20-4500D |
| BICARBONATE ALKALINITY | 6 | SM20-2320B |
| CALCIUM, TOTAL | 7.6 | SW846 6010B |
| CALCIUM, DISSOLVED | 8.2 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 40 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 56 ND | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 6.3 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 6.6 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 20 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 31 | SW846 6010B |
| NITRATE-NITROGEN | 3.1 | EPA 300 |
| pH-FIELD (SU) | 5.15 | FIELD |
| pH-LAB (SU) | 5.94 | SM20-4500B |
| POTASSIUM, TOTAL | 1.6 | SW846 6010B |
| POTASSIUM, DISSOLVED | 1.7 | SW846 6010B |
| SODIUM, TOTAL | 15 | SW846 6010B |
| SODIUM, DISSOLVED | 15.9 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 210 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 195 | EPA 120.1 |
| SULFATE | 2.5 | EPA 300 |
| ALKALINITY | 6 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 150 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 0.5 ND | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 0.17 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP029W

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------|------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP029W

Sample Date 5/19/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 48 | SW846 6010B |
| BARIUM, DISSOLVED | 49 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 6.5 | SW846 6010B |
| ZINC, DISSOLVED | 5.6 ND | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP029W

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------------|-----------------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

| | |
|----------------------|-----------|
| I.D. No | 101389 |
| Monitoring Point No. | FFMP029W |
| Sample Date | 5/19/2020 |

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 5.6 ND | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.

| | |
|----------------------|-----------|
| I.D. No | 101389 |
| Monitoring Point No. | FFMP029W |
| Sample Date | 5/19/2020 |

FORM 19

ANNUAL WATER QUALITY ANALYSES

Qualitatively Identified Organic Compounds

List at least ten volatile organic compounds not otherwise identified in this section. Their identification should be based upon those compounds showing the greatest apparent concentration from the peaks of a mass spectrum of each sample. These ten compounds shall be identified but the concentration of each is not required.

| <u>Constituent</u> | <u>CAS Number</u> |
|--------------------|-------------------|
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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP025W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 19.07 " Longitude: 76 ° 27 ' 1.12 "

Depth to Water Level: 23.32 ft Measured from: Land Surface TOC

Casing Stickup: 1.50 ft Elevation of Water Level: 453.48 ft./MSL

Sampling Depth: 39 ft Volume of Water Column: 24.50 gal

Total Well Depth: 40 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 3.1

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/19/2020 Sample Collection Time: 11:43

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3103148003 Final Lab Analysis Completion Date: 5/28/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments: _____

I.D. No 101389

Monitoring Point No. FFMP025W

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.111 | SM20-4500D |
| BICARBONATE ALKALINITY | 31 | SM20-2320B |
| CALCIUM, TOTAL | 22.5 | SW846 6010B |
| CALCIUM, DISSOLVED | 21.3 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 53.5 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 56 ND | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 12.9 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 12.5 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 9.4 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 5.6 ND | SW846 6010B |
| NITRATE-NITROGEN | 5.9 | EPA 300 |
| pH-FIELD (SU) | 5.61 | FIELD |
| pH-LAB (SU) | 6.42 | SM20-4500B |
| POTASSIUM, TOTAL | 2.3 | SW846 6010B |
| POTASSIUM, DISSOLVED | 2.4 | SW846 6010B |
| SODIUM, TOTAL | 20.7 | SW846 6010B |
| SODIUM, DISSOLVED | 19.6 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 374 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 375 | EPA 120.1 |
| SULFATE | 26.2 | EPA 300 |
| ALKALINITY | 31 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 182 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 1.1 | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 0.11 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP025W

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------------|-------------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP025W

Sample Date 5/19/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 48 | SW846 6010B |
| BARIUM, DISSOLVED | 53 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 6.9 | SW846 6010B |
| ZINC, DISSOLVED | 7.9 | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP025W

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------|------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP025W

Sample Date 5/19/2020

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 5.6 ND | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP30RW Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 15.52 " Longitude: 76 ° 27 ' 26.8 "

Depth to Water Level: 32.32 ft Measured from: Land Surface TOC

Casing Stickup: 2.20 ft Elevation of Water Level: 529.98 ft./MSL

Sampling Depth: 85 ft Volume of Water Column: 84.71 gal

Total Well Depth: 90 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 1.5

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/19/2020 Sample Collection Time: 13:02

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3103148004 Final Lab Analysis Completion Date: 5/27/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments:

I.D. No 101389

Monitoring Point No. FFMP30RW

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.109 | SM20-4500D |
| BICARBONATE ALKALINITY | 26 | SM20-2320B |
| CALCIUM, TOTAL | 19.6 | SW846 6010B |
| CALCIUM, DISSOLVED | 19.9 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 112 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 56 ND | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 12.6 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 12.9 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 920 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 950 | SW846 6010B |
| NITRATE-NITROGEN | 4.1 | EPA 300 |
| pH-FIELD (SU) | 5.21 | FIELD |
| pH-LAB (SU) | 6.03 | SM20-4500B |
| POTASSIUM, TOTAL | 2.6 | SW846 6010B |
| POTASSIUM, DISSOLVED | 2.7 | SW846 6010B |
| SODIUM, TOTAL | 50.6 | SW846 6010B |
| SODIUM, DISSOLVED | 50.1 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 536 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 515 | EPA 120.1 |
| SULFATE | 15.4 | EPA 300 |
| ALKALINITY | 26 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 338 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 0.87 | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 1.02 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP30RW

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------|------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP30RW

Sample Date 5/19/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 58 | SW846 6010B |
| BARIUM, DISSOLVED | 60 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.3 | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.52 | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 7.9 | SW846 6010B |
| ZINC, DISSOLVED | 8.3 | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP30RW

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------|------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP30RW

Sample Date 5/19/2020

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 8.4 | SW846 6010B |
| NICKEL | 12 | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP04AW Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 15.4 " Longitude: 76 ° 27 ' 26.58 "

Depth to Water Level: 31.94 ft Measured from: Land Surface TOC

Casing Stickup: 2.52 ft Elevation of Water Level: 528.78 ft./MSL

Sampling Depth: 146 ft Volume of Water Column: 395.92 gal

Total Well Depth: 301.52 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 0.8

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/19/2020 Sample Collection Time: 14:10

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3103148005 Final Lab Analysis Completion Date: 5/27/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments:

I.D. No 101389

Monitoring Point No. FFMP04AW

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.1 ND | SM20-4500D |
| BICARBONATE ALKALINITY | 192 | SM20-2320B |
| CALCIUM, TOTAL | 136 | SW846 6010B |
| CALCIUM, DISSOLVED | 142 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 301 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 67 | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 25.1 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 25.4 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 310 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 330 | SW846 6010B |
| NITRATE-NITROGEN | 0.28 | EPA 300 |
| pH-FIELD (SU) | 6.9 | FIELD |
| pH-LAB (SU) | 7.59 | SM20-4500B |
| POTASSIUM, TOTAL | 2.2 | SW846 6010B |
| POTASSIUM, DISSOLVED | 2.2 | SW846 6010B |
| SODIUM, TOTAL | 82.7 | SW846 6010B |
| SODIUM, DISSOLVED | 84.3 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 1465 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 1430 | EPA 120.1 |
| SULFATE | 46.8 | EPA 300 |
| ALKALINITY | 192 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 918 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 0.84 | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 0.54 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP04AW

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------|------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP04AW

Sample Date 5/19/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 190 | SW846 6010B |
| BARIUM, DISSOLVED | 190 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.5 | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 5.6 ND | SW846 6010B |
| ZINC, DISSOLVED | 5.6 ND | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP04AW

Sample Date 5/19/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------------|-----------------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP04AW

Sample Date 5/19/2020

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 11 | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP005W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 10.67 " Longitude: 76 ° 27 ' 21.3 "

Depth to Water Level: 59.14 ft Measured from: Land Surface TOC

Casing Stickup: 1.70 ft Elevation of Water Level: 478.26 ft./MSL

Sampling Depth: 135 ft Volume of Water Column: 133.44 gal

Total Well Depth: 150 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 1.2

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/20/2020 Sample Collection Time: 10:17

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3103620001 Final Lab Analysis Completion Date: 6/3/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments:

I.D. No 101389

Monitoring Point No. FFMP005W

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.1 ND | SM20-4500D |
| BICARBONATE ALKALINITY | 52 | SM20-2320B |
| CALCIUM, TOTAL | 74.7 | SW846 6010B |
| CALCIUM, DISSOLVED | 75.5 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 209 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 56 ND | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 20 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 20.6 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 110 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 110 | SW846 6010B |
| NITRATE-NITROGEN | 2.1 | EPA 300 |
| pH-FIELD (SU) | 5.38 | FIELD |
| pH-LAB (SU) | 6.02 | SM20-4500B |
| POTASSIUM, TOTAL | 3.3 | SW846 6010B |
| POTASSIUM, DISSOLVED | 3.3 | SW846 6010B |
| SODIUM, TOTAL | 54.4 | SW846 6010B |
| SODIUM, DISSOLVED | 54.8 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 965 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 904 | EPA 120.1 |
| SULFATE | 81.2 | EPA 300 |
| ALKALINITY | 52 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 556 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 1.5 | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 0.18 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP005W

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------------|-------------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP005W

Sample Date 5/20/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 51 | SW846 6010B |
| BARIUM, DISSOLVED | 52 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 7.7 | SW846 6010B |
| ZINC, DISSOLVED | 5.6 ND | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP005W

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------------|-----------------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP005W

Sample Date 5/20/2020

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 5.6 ND | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.

| | |
|----------------------------|-----------|
| I.D. No _____ | 101389 |
| Monitoring Point No. _____ | FFMP005W |
| Sample Date _____ | 5/20/2020 |

FORM 19
ANNUAL WATER QUALITY ANALYSES

Qualitatively Identified Organic Compounds

List at least ten volatile organic compounds not otherwise identified in this section. Their identification should be based upon those compounds showing the greatest apparent concentration from the peaks of a mass spectrum of each sample. These ten compounds shall be identified but the concentration of each is not required.

| <u>Constituent</u> | <u>CAS Number</u> |
|--------------------|-------------------|
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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP26RW Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 11.03 " Longitude: 76 ° 27 ' 20.3 "

Depth to Water Level: 70.45 ft Measured from: Land Surface TOC

Casing Stickup: 3.30 ft Elevation of Water Level: 476.95 ft./MSL

Sampling Depth: 105 ft Volume of Water Column: 63.96 gal

Total Well Depth: 114 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 1.8

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/20/2020 Sample Collection Time: 11:49

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3103620002 Final Lab Analysis Completion Date: 6/3/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments:

I.D. No 101389

Monitoring Point No. FFMP26RW

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.1 ND | SM20-4500D |
| BICARBONATE ALKALINITY | 54 | SM20-2320B |
| CALCIUM, TOTAL | 64.4 | SW846 6010B |
| CALCIUM, DISSOLVED | 65.6 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 164 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 56 ND | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 15.8 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 16.9 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 730 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 750 | SW846 6010B |
| NITRATE-NITROGEN | 1.2 | EPA 300 |
| pH-FIELD (SU) | 5.47 | FIELD |
| pH-LAB (SU) | 5.87 | SM20-4500B |
| POTASSIUM, TOTAL | 8.4 | SW846 6010B |
| POTASSIUM, DISSOLVED | 8.9 | SW846 6010B |
| SODIUM, TOTAL | 54.9 | SW846 6010B |
| SODIUM, DISSOLVED | 55.3 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 862 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 817 | EPA 120.1 |
| SULFATE | 103 | EPA 300 |
| ALKALINITY | 54 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 438 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 1.9 | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 0.45 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP26RW

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------------|-------------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP26RW

Sample Date 5/20/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 90 | SW846 6010B |
| BARIUM, DISSOLVED | 90 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 11 | SW846 6010B |
| ZINC, DISSOLVED | 11 | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP26RW

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------|------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP26RW

Sample Date 5/20/2020

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 27 | SW846 6010B |
| NICKEL | 5.6 ND | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP26RW

Sample Date 5/20/2020

FORM 19

ANNUAL WATER QUALITY ANALYSES

Qualitatively Identified Organic Compounds

List at least ten volatile organic compounds not otherwise identified in this section. Their identification should be based upon those compounds showing the greatest apparent concentration from the peaks of a mass spectrum of each sample. These ten compounds shall be identified but the concentration of each is not required.

| <u>Constituent</u> | <u>CAS Number</u> |
|--------------------|-------------------|
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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT



Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP03AW Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 24.05 " Longitude: 76 ° 27 ' 30.58 "

Depth to Water Level: 50.18 ft Measured from: Land Surface TOC

Casing Stickup: 1.20 ft Elevation of Water Level: 540.72 ft./MSL

Sampling Depth: 130 ft Volume of Water Column: 142.49 gal

Total Well Depth: 147.2 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 0.8

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/20/2020 Sample Collection Time: 13:03

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3103620003 Final Lab Analysis Completion Date: 6/3/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments:

I.D. No 101389

Monitoring Point No. FFMP03AW

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.1 ND | SM20-4500D |
| BICARBONATE ALKALINITY | 17 | SM20-2320B |
| CALCIUM, TOTAL | 17.7 | SW846 6010B |
| CALCIUM, DISSOLVED | 17.4 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 28.7 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 56 ND | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 12.7 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 13.3 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 290 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 280 | SW846 6010B |
| NITRATE-NITROGEN | 22 | EPA 300 |
| pH-FIELD (SU) | 5.03 | FIELD |
| pH-LAB (SU) | 5.49 | SM20-4500B |
| POTASSIUM, TOTAL | 1.3 | SW846 6010B |
| POTASSIUM, DISSOLVED | 1.3 | SW846 6010B |
| SODIUM, TOTAL | 11.8 | SW846 6010B |
| SODIUM, DISSOLVED | 12.1 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 320 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 294 | EPA 120.1 |
| SULFATE | 3.4 | EPA 300 |
| ALKALINITY | 17 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 184 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 0.5 ND | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 0.1 ND | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP03AW

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------|---------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP03AW

Sample Date 5/20/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 45 | SW846 6010B |
| BARIUM, DISSOLVED | 45 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 6.5 | SW846 6010B |
| COPPER, DISSOLVED | 6.3 | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 17 | SW846 6010B |
| ZINC, DISSOLVED | 17 | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP03AW

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------------|-----------------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP03AW

Sample Date 5/20/2020

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 9.5 | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP018W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 11.62 " Longitude: 76 ° 27 ' 5.68 "

Depth to Water Level: 25.63 ft Measured from: Land Surface TOC

Casing Stickup: 2.46 ft Elevation of Water Level: 446.57 ft./MSL

Sampling Depth: 40 ft Volume of Water Column: 16.84 gal

Total Well Depth: 51.43 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 3.9

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/20/2020 Sample Collection Time: 13:52

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3103620004 Final Lab Analysis Completion Date: 6/3/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments: _____

I.D. No 101389

Monitoring Point No. FFMP018W

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------------|-------------------------------|
| AMMONIA-NITROGEN | 0.1 ND | SM20-4500D |
| BICARBONATE ALKALINITY | 25 | SM20-2320B |
| CALCIUM, TOTAL | 29.2 | SW846 6010B |
| CALCIUM, DISSOLVED | 29.7 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 99.3 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 67 | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 14.5 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 15.3 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 210 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 230 | SW846 6010B |
| NITRATE-NITROGEN | 4.8 | EPA 300 |
| pH-FIELD (SU) | 5.34 | FIELD |
| pH-LAB (SU) | 6.09 | SM20-4500B |
| POTASSIUM, TOTAL | 4.5 | SW846 6010B |
| POTASSIUM, DISSOLVED | 4.7 | SW846 6010B |
| SODIUM, TOTAL | 31.1 | SW846 6010B |
| SODIUM, DISSOLVED | 33.2 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 528 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 497 | EPA 120.1 |
| SULFATE | 40.8 | EPA 300 |
| ALKALINITY | 25 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 296 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 0.5 ND | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 0.23 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP018W

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------|---------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP018W

Sample Date 5/20/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 66 | SW846 6010B |
| BARIUM, DISSOLVED | 65 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 15 | SW846 6010B |
| ZINC, DISSOLVED | 14 | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP018W

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------------|-----------------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP018W

Sample Date 5/20/2020

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 6.6 | SW846 6010B |
| NICKEL | 5.6 ND | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.

| | |
|----------------------|-----------|
| I.D. No | 101389 |
| Monitoring Point No. | FFMP018W |
| Sample Date | 5/20/2020 |

FORM 19
ANNUAL WATER QUALITY ANALYSES

Qualitatively Identified Organic Compounds

List at least ten volatile organic compounds not otherwise identified in this section. Their identification should be based upon those compounds showing the greatest apparent concentration from the peaks of a mass spectrum of each sample. These ten compounds shall be identified but the concentration of each is not required.

| <u>Constituent</u> | <u>CAS Number</u> |
|--------------------|-------------------|
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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP019W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 11.58 " Longitude: 76 ° 27 ' 5.75 "

Depth to Water Level: 26.5 ft Measured from: Land Surface TOC

Casing Stickup: 1.79 ft Elevation of Water Level: 445.45 ft./MSL

Sampling Depth: 49 ft Volume of Water Column: 69.38 gal

Total Well Depth: 132.79 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 2.4

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/20/2020 Sample Collection Time: 14:36

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3103620005 Final Lab Analysis Completion Date: 6/3/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments: _____

I.D. No 101389

Monitoring Point No. FFMP019W

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.1 ND | SM20-4500D |
| BICARBONATE ALKALINITY | 63 | SM20-2320B |
| CALCIUM, TOTAL | 55.4 | SW846 6010B |
| CALCIUM, DISSOLVED | 54.8 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 86.9 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 56 ND | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 5.6 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 5.6 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 5.6 ND | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 5.6 ND | SW846 6010B |
| NITRATE-NITROGEN | 0.26 | EPA 300 |
| pH-FIELD (SU) | 6.53 | FIELD |
| pH-LAB (SU) | 7.3 | SM20-4500B |
| POTASSIUM, TOTAL | 0.84 | SW846 6010B |
| POTASSIUM, DISSOLVED | 0.84 | SW846 6010B |
| SODIUM, TOTAL | 9.9 | SW846 6010B |
| SODIUM, DISSOLVED | 10 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 463 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 428 | EPA 120.1 |
| SULFATE | 15.8 | EPA 300 |
| ALKALINITY | 63 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 392 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 0.65 | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 0.11 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP019W

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------|------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP019W

Sample Date 5/20/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 80 | SW846 6010B |
| BARIUM, DISSOLVED | 78 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.3 | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 5.6 ND | SW846 6010B |
| ZINC, DISSOLVED | 5.6 ND | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP019W

Sample Date 5/20/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------|------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP019W

Sample Date 5/20/2020

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 5.6 ND | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP031W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 31.2 " Longitude: 76 ° 27 ' 23.53 "

Depth to Water Level: 63.94 ft Measured from: Land Surface TOC

Casing Stickup: 2.38 ft Elevation of Water Level: 548.72 ft./MSL

Sampling Depth: 130 ft Volume of Water Column: 111.71 gal

Total Well Depth: 140 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 0.8

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/21/2020 Sample Collection Time: 13:15

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3103842001 Final Lab Analysis Completion Date: 6/1/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments:

I.D. No 101389

Monitoring Point No. FFMP031W

Sample Date 5/21/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.169 | SM20-4500D |
| BICARBONATE ALKALINITY | 67 | SM20-2320B |
| CALCIUM, TOTAL | 37.9 | SW846 6010B |
| CALCIUM, DISSOLVED | 37.2 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 24.2 | EPA 300 |
| FLUORIDE | 0.2 | EPA 300 |
| IRON, TOTAL (ug/l) | 3500 | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 3300 | SW846 6010B |
| MAGNESIUM, TOTAL | 3.9 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 3.8 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 300 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 290 | SW846 6010B |
| NITRATE-NITROGEN | 0.2 ND | EPA 300 |
| pH-FIELD (SU) | 7.31 | FIELD |
| pH-LAB (SU) | 7.81 | SM20-4500B |
| POTASSIUM, TOTAL | 1.2 | SW846 6010B |
| POTASSIUM, DISSOLVED | 1.2 | SW846 6010B |
| SODIUM, TOTAL | 10.4 | SW846 6010B |
| SODIUM, DISSOLVED | 10.3 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 311 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 294 | EPA 120.1 |
| SULFATE | 43.4 | EPA 300 |
| ALKALINITY | 67 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 198 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 0.5 ND | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 14.6 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP031W

Sample Date 5/21/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------------|-------------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP031W

Sample Date 5/21/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 29 | SW846 6010B |
| BARIUM, DISSOLVED | 27 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 5.6 ND | SW846 6010B |
| ZINC, DISSOLVED | 5.6 ND | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP031W

Sample Date 5/21/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------|------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

| | |
|----------------------|-----------|
| I.D. No | 101389 |
| Monitoring Point No. | FFMP031W |
| Sample Date | 5/21/2020 |

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 5.6 ND | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP002W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 32.25 " Longitude: 76 ° 27 ' 24.03 "

Depth to Water Level: 58.11 ft Measured from: Land Surface TOC

Casing Stickup: 1.60 ft Elevation of Water Level: 555.09 ft./MSL

Sampling Depth: 85 ft Volume of Water Column: 163.74 gal

Total Well Depth: 169.6 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 0.7

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/21/2020 Sample Collection Time: 13:45

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3103842002 Final Lab Analysis Completion Date: 6/1/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments:

I.D. No 101389

Monitoring Point No. FFMP002W

Sample Date 5/21/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.1 ND | SM20-4500D |
| BICARBONATE ALKALINITY | 5 ND | SM20-2320B |
| CALCIUM, TOTAL | 18.4 | SW846 6010B |
| CALCIUM, DISSOLVED | 18.4 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 20.6 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 56 ND | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 7.6 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 7.3 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 210 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 210 | SW846 6010B |
| NITRATE-NITROGEN | 19.8 | EPA 300 |
| pH-FIELD (SU) | 4.61 | FIELD |
| pH-LAB (SU) | 5.23 | SM20-4500B |
| POTASSIUM, TOTAL | 1 | SW846 6010B |
| POTASSIUM, DISSOLVED | 1 | SW846 6010B |
| SODIUM, TOTAL | 13.3 | SW846 6010B |
| SODIUM, DISSOLVED | 13 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 293 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 263 | EPA 120.1 |
| SULFATE | 9.3 | EPA 300 |
| ALKALINITY | 5 ND | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 172 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 0.5 ND | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 0.12 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP002W

Sample Date 5/21/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------------|-------------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP002W

Sample Date 5/21/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 63 | SW846 6010B |
| BARIUM, DISSOLVED | 63 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 12 | SW846 6010B |
| COPPER, DISSOLVED | 12 | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 6.4 | SW846 6010B |
| LEAD, DISSOLVED | 6.3 | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 20 | SW846 6010B |
| ZINC, DISSOLVED | 20 | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP002W

Sample Date 5/21/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------------|-----------------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP002W

Sample Date 5/21/2020

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 13 | SW846 6010B |
| NICKEL | 18 | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP02SW Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 27.9 " Longitude: 76 ° 27 ' 1.58 "

Depth to Water Level: 14.85 ft Measured from: Land Surface TOC

Casing Stickup: ft Elevation of Water Level: 495.05 ft./MSL

Sampling Depth: 18 ft Volume of Water Column: gal

Total Well Depth: 25 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 0.3

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/22/2020 Sample Collection Time: 9:09

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3104060001 Final Lab Analysis Completion Date: 6/3/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments:

I.D. No 101389

Monitoring Point No. FFMP02SW

Sample Date 5/22/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.1 ND | SM20-4500D |
| BICARBONATE ALKALINITY | 17 | SM20-2320B |
| CALCIUM, TOTAL | 17.4 | SW846 6010B |
| CALCIUM, DISSOLVED | 17.3 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 66.4 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 1100 | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 7.1 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 7.1 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 21 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 16 | SW846 6010B |
| NITRATE-NITROGEN | 15.2 | EPA 300 |
| pH-FIELD (SU) | 5.34 | FIELD |
| pH-LAB (SU) | 5.89 | SM20-4500B |
| POTASSIUM, TOTAL | 4.4 | SW846 6010B |
| POTASSIUM, DISSOLVED | 4.4 | SW846 6010B |
| SODIUM, TOTAL | 52.1 | SW846 6010B |
| SODIUM, DISSOLVED | 52.6 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 505 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 476 | EPA 120.1 |
| SULFATE | 30.3 | EPA 300 |
| ALKALINITY | 17 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 282 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 3.2 | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 15.4 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP02SW

Sample Date 5/22/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------|------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP02SW

Sample Date 5/22/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 89 | SW846 6010B |
| BARIUM, DISSOLVED | 82 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 13 | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 12 | SW846 6010B |
| COPPER, DISSOLVED | 7.7 | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 16 | SW846 6010B |
| ZINC, DISSOLVED | 14 | SW846 6010B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP02SW

Sample Date 5/22/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------|------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP02SW

Sample Date 5/22/2020

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 10 | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT**



Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

**FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP02DW Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 27.74 " Longitude: 76 ° 27 ' 1.49 "

Depth to Water Level: 19.65 ft Measured from: Land Surface TOC

Casing Stickup: _____ ft Elevation of Water Level: 489.95 ft./MSL

Sampling Depth: 120 ft Volume of Water Column: _____ gal

Total Well Depth: 152 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 0.5

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 5/22/2020 Sample Collection Time: 10:19

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3104060002 Final Lab Analysis Completion Date: 6/3/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments: _____

I.D. No 101389

Monitoring Point No. FFMP02DW

Sample Date 5/22/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.1 ND | SM20-4500D |
| BICARBONATE ALKALINITY | 113 | SM20-2320B |
| CALCIUM, TOTAL | 104 | SW846 6010B |
| CALCIUM, DISSOLVED | 102 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 318 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 680 | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 60 | SW846 6010B |
| MAGNESIUM, TOTAL | 17.6 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 17.4 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 420 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 430 | SW846 6010B |
| NITRATE-NITROGEN | 8.5 | EPA 300 |
| pH-FIELD (SU) | 7.81 | FIELD |
| pH-LAB (SU) | 7.65 | SM20-4500B |
| POTASSIUM, TOTAL | 1.7 | SW846 6010B |
| POTASSIUM, DISSOLVED | 1.7 | SW846 6010B |
| SODIUM, TOTAL | 107 | SW846 6010B |
| SODIUM, DISSOLVED | 105 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 17 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 1340 | EPA 120.1 |
| SULFATE | 30.9 | EPA 300 |
| ALKALINITY | 113 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 882 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 0.61 | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 7.49 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP02DW

Sample Date 5/22/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------------|-------------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP02DW

Sample Date 5/22/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 150 | SW846 6010B |
| BARIUM, DISSOLVED | 150 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 5.6 ND | SW846 6010B |
| ZINC, DISSOLVED | 5.6 ND | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP02DW

Sample Date 5/22/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------|------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP02DW

Sample Date 5/22/2020

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 5.6 ND | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.



**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT**

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

**FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP032W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 33.45 " Longitude: 76 ° 27 ' 17.71 "

Depth to Water Level: 49.35 ft Measured from: Land Surface TOC

Casing Stickup: 2.06 ft Elevation of Water Level: 544.74 ft./MSL

Sampling Depth: 62 ft Volume of Water Column: 37.67 gal

Total Well Depth: 75 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 0.8

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/22/2020 Sample Collection Time: 11:11

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3104060003 Final Lab Analysis Completion Date: 6/3/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments: _____

I.D. No 101389

Monitoring Point No. FFMP032W

Sample Date 5/22/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.612 | SM20-4500D |
| BICARBONATE ALKALINITY | 64 | SM20-2320B |
| CALCIUM, TOTAL | 13.3 | SW846 6010B |
| CALCIUM, DISSOLVED | 13.1 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 20.4 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 10600 | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 4900 | SW846 6010B |
| MAGNESIUM, TOTAL | 5.2 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 5.1 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 500 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 490 | SW846 6010B |
| NITRATE-NITROGEN | 0.2 ND | EPA 300 |
| pH-FIELD (SU) | 6.94 | FIELD |
| pH-LAB (SU) | 7.18 | SM20-4500B |
| POTASSIUM, TOTAL | 1.3 | SW846 6010B |
| POTASSIUM, DISSOLVED | 1.3 | SW846 6010B |
| SODIUM, TOTAL | 12.5 | SW846 6010B |
| SODIUM, DISSOLVED | 12.7 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 209 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 191 | EPA 120.1 |
| SULFATE | 2 ND | EPA 300 |
| ALKALINITY | 64 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 116 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 0.5 ND | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 139 | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP032W

Sample Date 5/22/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------------|-------------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP032W

Sample Date 5/22/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 5.6 ND | SW846 6010B |
| BARIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 5.6 ND | SW846 6010B |
| ZINC, DISSOLVED | 5.6 ND | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP032W

Sample Date 5/22/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------|------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP032W

Sample Date 5/22/2020

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 5.6 ND | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/17/2020

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP016W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 19.15 "

Longitude: 76 ° 27 ' 0.88 "

Depth to Water Level: 22.57 ft

Measured from: Land Surface TOC

Casing Stickup: 1.97 ft

Elevation of Water Level: 452.03 ft./MSL

Sampling Depth: 135 ft

Volume of Water Column: 186.86 gal

Total Well Depth: 149.8 ft

Sampling Method: Pumped Bailed Grab

Well Purged: Yes No

Well Volumes Purged: _____

Sample Field Filtered (must be 0.45 micron)?: Yes No

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 5/22/2020

Sample Collection Time: 11:28

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: Yes No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3104060004

Final Lab Analysis Completion Date: 6/3/2020

Name/Affiliation of Person who Filled Out Form: Daniel A. Brown

Comments: _____

I.D. No 101389

Monitoring Point No. FFMP016W

Sample Date 5/22/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------|------------------------|
| AMMONIA-NITROGEN | 0.1 ND | SM20-4500D |
| BICARBONATE ALKALINITY | 33 | SM20-2320B |
| CALCIUM, TOTAL | 31.5 | SW846 6010B |
| CALCIUM, DISSOLVED | 31.4 | SW846 6010B |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 76.7 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL (ug/l) | 62 | SW846 6010B |
| IRON, DISSOLVED (ug/l) | 56 ND | SW846 6010B |
| MAGNESIUM, TOTAL | 15.3 | SW846 6010B |
| MAGNESIUM, DISSOLVED | 14.9 | SW846 6010B |
| MANGANESE, TOTAL (ug/l) | 12 | SW846 6010B |
| MANGANESE, DISSOLVED (ug/l) | 12 | SW846 6010B |
| NITRATE-NITROGEN | 9.1 | EPA 300 |
| pH-FIELD (SU) | 5.85 | FIELD |
| pH-LAB (SU) | 6.29 | SM20-4500B |
| POTASSIUM, TOTAL | 2.3 | SW846 6010B |
| POTASSIUM, DISSOLVED | 2.3 | SW846 6010B |
| SODIUM, TOTAL | 26.8 | SW846 6010B |
| SODIUM, DISSOLVED | 26.9 | SW846 6010B |
| SPEC. COND., FIELD (umhos/cm) | 510 | FIELD |
| SPEC. COND., LAB (umhos/cm) | 496 | EPA 120.1 |
| SULFATE | 31.8 | EPA 300 |
| ALKALINITY | 33 | SM20-2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 284 | SM20-2540C |
| TOC (TOTAL ORGANIC CARBON) | 0.82 | SM20-5310B |
| TOTAL PHENOLICS (ug/l) | 5 ND | SW846 9066 |
| TURBIDITY (N.T.U.) | 0.1 ND | SM20- 2130B |

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No. 101389

Monitoring Point No. FFMP016W

Sample Date 5/22/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|--------------------------|--------------------|---------------------------|
| BENZENE | 1 ND | SW846 8260B |
| 1,2-DIBROMOETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHANE | 1 ND | SW846 8260B |
| 1,1-DICHLOROETHENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROETHANE | 1 ND | SW846 8260B |
| CIS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| TRANS 1,2-DICHLOROETHENE | 1 ND | SW846 8260B |
| ETHYLBENZENE | 1 ND | SW846 8260B |
| METHYLENE CHLORIDE | 1 ND | SW846 8260B |
| TETRACHLOROETHENE | 1 ND | SW846 8260B |
| TOLUENE | 1 ND | SW846 8260B |
| 1,1,1-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROETHENE | 1 ND | SW846 8260B |
| VINYL CHLORIDE | 1 ND | SW846 8260B |
| XYLENES (TOTAL) | 3 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP016W

Sample Date 5/22/2020

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

- 1-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | SW846 6010B |
| ARSENIC, DISSOLVED | 3 ND | SW846 6010B |
| BARIUM, TOTAL | 61 | SW846 6010B |
| BARIUM, DISSOLVED | 62 | SW846 6010B |
| CADMIUM, TOTAL | 1.1 ND | SW846 6010B |
| CADMIUM, DISSOLVED | 1.1 ND | SW846 6010B |
| CHROMIUM, TOTAL | 2.2 ND | SW846 6010B |
| CHROMIUM, DISSOLVED | 2.2 ND | SW846 6010B |
| COPPER, TOTAL | 5.6 ND | SW846 6010B |
| COPPER, DISSOLVED | 5.6 ND | SW846 6010B |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | SW846 6010B |
| LEAD, DISSOLVED | 2.2 ND | SW846 6010B |
| MERCURY, TOTAL | 0.5 ND | SW846 7470A |
| MERCURY, DISSOLVED | 0.5 ND | SW846 7470A |
| SELENIUM, TOTAL | 5.6 ND | SW846 6010B |
| SELENIUM, DISSOLVED | 5.6 ND | SW846 6010B |
| SILVER, TOTAL | 2.2 ND | SW846 6010B |
| SILVER, DISSOLVED | 2.2 ND | SW846 6010B |
| ZINC, TOTAL | 7 | SW846 6010B |
| ZINC, DISSOLVED | 15 | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP016W

Sample Date 5/22/2020

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-A. Organics (Enter all data in ug/l)

| ANALYTE | VALUE ^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------|------------------------|
| BROMOFORM | 1 ND | SW846 8260B |
| BROMOMETHANE | 1 ND | SW846 8260B |
| CARBON TETRACHLORIDE | 1 ND | SW846 8260B |
| CHLOROENZENE | 1 ND | SW846 8260B |
| CHLOROETHANE | 1 ND | SW846 8260B |
| DIBROMOCHLOROMETHANE | 1 ND | SW846 8260B |
| CHLOROMETHANE | 1 ND | SW846 8260B |
| 3-CHLORO-1-PROPENE | 1 ND | SW846 8260B |
| 1,2-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,3-DICHLOROENZENE | 1 ND | SW846 8260B |
| 1,4-DICHLOROENZENE | 1 ND | SW846 8260B |
| DICHLORODIFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2-DICHLOROPROPANE | 1 ND | SW846 8260B |
| CIS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | SW846 8260B |
| 2-BUTANONE (MEK) | 10 ND | SW846 8260B |
| 4-METHYL-2-PENTANONE | 5 ND | SW846 8260B |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | SW846 8260B |
| 1,1,2-TRICHLOROETHANE | 1 ND | SW846 8260B |
| TRICHLOROFLUOROMETHANE | 1 ND | SW846 8260B |
| 1,2,3-TRICHLOROPROPANE | 2 ND | SW846 8260B |

T Please indicate detection limit if analyte is not detected.

| | |
|----------------------|-----------|
| I.D. No | 101389 |
| Monitoring Point No. | FFMP016W |
| Sample Date | 5/22/2020 |

FORM 19
ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Detection Zone Add-On List - When the MCL of any VOC is exceeded in the detection zone Form 50 monitoring, the following analytes must be monitored annually in the groundwater monitoring wells.

ORGANICS AND METALS (Enter all data in ug/l)

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | SW846 8260B |
| ACRYLONITRILE | 5 ND | SW846 8260B |
| BROMOCHLOROMETHANE (CHLOROBROMOMETHAN | 1 ND | SW846 8260B |
| BROMODICHLOROMETHANE | 1 ND | SW846 8260B |
| CARBON DISULFIDE | 1 ND | SW846 8260B |
| CHLOROFORM | 1 ND | SW846 8260B |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | SW846 8260B |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | SW846 8260B |
| 2-HEXANONE | 5 ND | SW846 8260B |
| DIBROMOMETHANE | 1 ND | SW846 8260B |
| IODOMETHANE | 1 ND | SW846 8260B |
| STYRENE | 1 ND | SW846 8260B |
| VINYL ACETATE | 5 ND | SW846 8260B |
| ANTIMONY | 2.2 ND | SW846 6010B |
| BERYLLIUM | 1.1 ND | SW846 6010B |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 5.6 ND | SW846 6010B |
| THALLIUM | 1.1 ND | SW846 6010B |
| VANADIUM | 2.2 ND | SW846 6010B |

T Please indicate detection limit if analyte is not detected.

June 3, 2020

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

| | | | |
|-----------------|------------------|---------------|-----------------------------------|
| Project Name: | FREY FARM | Workorder: | 3103842 |
| Purchase Order: | PO1000126 | Workorder ID: | 2ND QTR 2020 FFMP-FORM 19A |

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Thursday, May 21, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

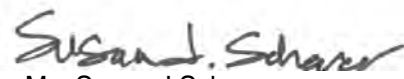
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki , Ms. Jordan Gallagher , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.


Ms. Susan J Scherer
Project Coordinator

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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

SAMPLE SUMMARY

Workorder: 3103842 2ND QTR 2020 FFMP-FORM 19A

| Lab ID | Sample ID | Matrix | Date Collected | Date Received | Collected By |
|------------|-----------|--------------|-----------------|-----------------|-------------------|
| 3103842001 | FFMP031W | Ground Water | 5/21/2020 13:15 | 5/21/2020 15:25 | Mr. Brian G Shade |
| 3103842002 | FFMP002W | Ground Water | 5/21/2020 13:45 | 5/21/2020 15:25 | Mr. Brian G Shade |

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Vancouver Waterloo · Winnipeg · Yellowknife **United States:** Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York **Mexico:** Monterrey

SAMPLE SUMMARY

Workorder: 3103842 2ND QTR 2020 FFMP-FORM 19A

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

| | |
|--------|--|
| J | Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte |
| U | Indicates that the analyte was Not Detected (ND) |
| N | Indicates presumptive evidence of the presence of a compound |
| MDL | Method Detection Limit |
| PQL | Practical Quantitation Limit |
| RDL | Reporting Detection Limit |
| ND | Not Detected - indicates that the analyte was Not Detected at the RDL |
| Cntr | Analysis was performed using this container |
| RegLmt | Regulatory Limit |
| LCS | Laboratory Control Sample |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| DUP | Sample Duplicate |
| %Rec | Percent Recovery |
| RPD | Relative Percent Difference |
| LOD | DoD Limit of Detection |
| LOQ | DoD Limit of Quantitation |
| DL | DoD Detection Limit |
| I | Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL) |
| (S) | Surrogate Compound |
| NC | Not Calculated |
| * | Result outside of QC limits |

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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

ANALYTICAL RESULTS

Workorder: 3103842 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3103842001**

Date Collected: 5/21/2020 13:15

Matrix: Ground Water

 Sample ID: **FFMP031W**

Date Received: 5/21/2020 15:25

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Bromochloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |

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ANALYTICAL RESULTS

Workorder: 3103842 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3103842001**

Date Collected: 5/21/2020 13:15

Matrix: Ground Water

 Sample ID: **FFMP031W**

Date Received: 5/21/2020 15:25

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 102 | | % | 62 - 133 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| 4-Bromofluorobenzene (S) | 104 | | % | 79 - 114 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Dibromofluoromethane (S) | 97.1 | | % | 78 - 116 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |
| Toluene-d8 (S) | 97.4 | | % | 76 - 127 | SW846 8260B | | | 5/23/20 00:44 | PDK | J |

LIBRARY SEARCH - VOLATILES

No TIC's Detected . Lib Search VOC 5/23/20 00:44 CPK J

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|-------|-----|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 67 | | mg/L | 5 | SM2320B-2011 | | | 5/24/20 05:05 | R2B | B |
| Alkalinity, Total | 67 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/24/20 05:05 | R2B | A |
| Ammonia-N | 0.169 | | mg/L | 0.100 | ASTM D6919-09 | | | 5/30/20 16:11 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/30/20 03:20 | JAM | C |
| Chloride | 24.2 | | mg/L | 2.0 | EPA 300.0 | | | 5/22/20 13:50 | MBW | B |
| Fluoride | 0.20 | | mg/L | 0.20 | EPA 300.0 | | | 5/22/20 13:50 | MBW | B |
| Nitrate-N | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/22/20 13:50 | MBW | B |
| pH | 7.81 | 2 | pH_Units | | S4500HB-11 | | | 5/24/20 05:05 | R2B | B |
| Phenolics | ND | 3,4 | mg/L | 0.005 | SW846 9066 | 5/26/20 05:17 | C_D | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 294 | | umhos/cm | 1 | SM2510B-2011 | | | 5/24/20 05:05 | R2B | B |
| Sulfate | 43.4 | | mg/L | 2.0 | EPA 300.0 | | | 5/22/20 13:50 | MBW | B |
| Total Dissolved Solids | 198 | | mg/L | 25 | S2540C-11 | | | 5/26/20 11:10 | LXW | B |
| Total Organic Carbon (TOC) | ND | | mg/L | 0.50 | SM5310B-2011 | | | 6/1/20 21:44 | PAG | G |
| Turbidity | 14.6 | | NTU | 0.10 | SM2130B-2011 | | | 5/22/20 06:33 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3103842 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103842001**

Date Collected: 5/21/2020 13:15

Matrix: Ground Water

Sample ID: **FFMP031W**

Date Received: 5/21/2020 15:25

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| Barium, Total | 0.029 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Barium, Dissolved | 0.027 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| Calcium, Total | 37.9 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Calcium, Dissolved | 37.2 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| Iron, Total | 3.5 | | mg/L | 0.056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Iron, Dissolved | 3.3 | | mg/L | 0.056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| Magnesium, Total | 3.9 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Magnesium, Dissolved | 3.8 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| Manganese, Total | 0.30 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Manganese, Dissolved | 0.29 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/22/20 11:40 | AHI | 5/23/20 13:52 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 14:27 | AHI | D |
| Nickel, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Potassium, Total | 1.2 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Potassium, Dissolved | 1.2 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| Sodium, Total | 10.4 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Sodium, Dissolved | 10.3 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |
| Zinc, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:26 | MSA | E1 |

ALS Environmental Laboratory Locations Across North America

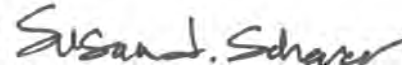
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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

ANALYTICAL RESULTS

Workorder: 3103842 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103842001** Date Collected: 5/21/2020 13:15 Matrix: Ground Water
 Sample ID: **FFMP031W** Date Received: 5/21/2020 15:25

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:15 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 63.94 | | Feet | | Field | | | 5/21/20 13:15 | BGS | F |
| Elev Top MW Casing above MSL | 612.66 | | Feet | | Field | | | 5/21/20 13:15 | BGS | F |
| Flow Rate | 1.58 | | gal/min | | Field | | | 5/21/20 13:15 | BGS | F |
| Ground Water Elevation | 548.72 | | ft/MSL | | Field | | | 5/21/20 13:15 | BGS | F |
| pH, Field (SM4500B) | 7.31 | | pH_Units | | Field | | | 5/21/20 13:15 | BGS | F |
| Sample Depth | 130.00 | | Feet | | Field | | | 5/21/20 13:15 | BGS | F |
| Specific Conductance, Field | 311 | | umhos/cm | 1 | Field | | | 5/21/20 13:15 | BGS | F |
| Temperature | 15.95 | | Deg. C | | Field | | | 5/21/20 13:15 | BGS | F |
| Total Well Depth | 142.70 | | Feet | | Field | | | 5/21/20 13:15 | BGS | F |
| Volume in Water Column | 115.78 | | Gallons | | Field | | | 5/21/20 13:15 | BGS | F |
| Water Level After Purge | 105.24 | | Feet | | Field | | | 5/21/20 13:15 | BGS | F |
| Well Volumes Purged | 0.82 | | Vol | | Field | | | 5/21/20 13:15 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3103842 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103842002**

Date Collected: 5/21/2020 13:45

Matrix: Ground Water

Sample ID: **FFMP002W**

Date Received: 5/21/2020 15:25

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Bromochloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |

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ANALYTICAL RESULTS

Workorder: 3103842 2ND QTR 2020 FFMP-FORM 19A

| | | |
|----------------------------|---------------------------------|----------------------|
| Lab ID: 3103842002 | Date Collected: 5/21/2020 13:45 | Matrix: Ground Water |
| Sample ID: FFMP002W | Date Received: 5/21/2020 15:25 | |

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 101 | | % | 62 - 133 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| 4-Bromofluorobenzene (S) | 105 | | % | 79 - 114 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Dibromofluoromethane (S) | 97.1 | | % | 78 - 116 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |
| Toluene-d8 (S) | 97.1 | | % | 76 - 127 | SW846 8260B | | | 5/23/20 01:06 | PDK | J |

LIBRARY SEARCH - VOLATILES

| | | | | |
|-------------------|----------------|---------------|-----|---|
| No TIC's Detected | Lib Search VOC | 5/23/20 01:06 | CPK | J |
|-------------------|----------------|---------------|-----|---|

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | ND | | mg/L | 5 | SM2320B-2011 | | | 5/24/20 05:05 | R2B | B |
| Alkalinity, Total | ND | 1 | mg/L | 5 | SM2320B-2011 | | | 5/24/20 05:05 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/30/20 15:43 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/29/20 00:58 | JAM | C |
| Chloride | 20.6 | | mg/L | 2.0 | EPA 300.0 | | | 5/22/20 14:07 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/22/20 14:07 | MBW | B |
| Nitrate-N | 19.8 | | mg/L | 0.20 | EPA 300.0 | | | 5/22/20 14:07 | MBW | B |
| pH | 5.23 | 2 | pH_Units | | S4500HB-11 | | | 5/24/20 05:05 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/26/20 05:17 | C_D | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 263 | | umhos/cm | 1 | SM2510B-2011 | | | 5/24/20 05:05 | R2B | B |
| Sulfate | 9.3 | | mg/L | 2.0 | EPA 300.0 | | | 5/22/20 14:07 | MBW | B |
| Total Dissolved Solids | 172 | | mg/L | 25 | S2540C-11 | | | 5/26/20 11:10 | LXW | B |
| Total Organic Carbon (TOC) | ND | | mg/L | 0.50 | SM5310B-2011 | | | 6/1/20 21:44 | PAG | G |
| Turbidity | 0.12 | | NTU | 0.10 | SM2130B-2011 | | | 5/22/20 06:33 | R2B | B |

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 Mexico: Monterrey

ANALYTICAL RESULTS

Workorder: 3103842 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103842002**

Date Collected: 5/21/2020 13:45

Matrix: Ground Water

Sample ID: **FFMP002W**

Date Received: 5/21/2020 15:25

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| Barium, Total | 0.063 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Barium, Dissolved | 0.063 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| Calcium, Total | 18.4 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Calcium, Dissolved | 18.4 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| Cobalt, Total | 0.013 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Copper, Total | 0.012 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Copper, Dissolved | 0.012 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| Iron, Total | ND | | mg/L | 0.056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| Lead, Total | 0.0064 | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Lead, Dissolved | 0.0063 | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| Magnesium, Total | 7.6 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Magnesium, Dissolved | 7.3 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| Manganese, Total | 0.21 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Manganese, Dissolved | 0.21 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/23/20 10:00 | AHI | 5/23/20 15:53 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 14:28 | AHI | D |
| Nickel, Total | 0.018 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Potassium, Total | 1.0 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Potassium, Dissolved | 1.0 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| Sodium, Total | 13.3 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Sodium, Dissolved | 13.0 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |
| Zinc, Total | 0.020 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 07:29 | MSA | E1 |

ALS Environmental Laboratory Locations Across North America

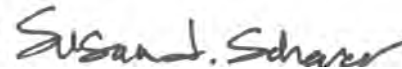
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ANALYTICAL RESULTS

Workorder: 3103842 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103842002** Date Collected: 5/21/2020 13:45 Matrix: Ground Water
 Sample ID: **FFMP002W** Date Received: 5/21/2020 15:25

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | 0.020 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:20 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 58.11 | | Feet | | Field | | | 5/21/20 13:45 | BGS | F |
| Elev Top MW Casing above MSL | 613.20 | | Feet | | Field | | | 5/21/20 13:45 | BGS | F |
| Flow Rate | 1.54 | | gal/min | | Field | | | 5/21/20 13:45 | BGS | F |
| Ground Water Elevation | 555.09 | | ft/MSL | | Field | | | 5/21/20 13:45 | BGS | F |
| pH, Field (SM4500B) | 4.61 | | pH_Units | | Field | | | 5/21/20 13:45 | BGS | F |
| Sample Depth | 85.00 | | Feet | | Field | | | 5/21/20 13:45 | BGS | F |
| Specific Conductance, Field | 293 | | umhos/cm | 1 | Field | | | 5/21/20 13:45 | BGS | F |
| Temperature | 11.11 | | Deg. C | | Field | | | 5/21/20 13:45 | BGS | F |
| Total Well Depth | 90.02 | | Feet | | Field | | | 5/21/20 13:45 | BGS | F |
| Volume in Water Column | 46.91 | | Gallons | | Field | | | 5/21/20 13:45 | BGS | F |
| Water Level After Purge | 73.21 | | Feet | | Field | | | 5/21/20 13:45 | BGS | F |
| Well Volumes Purged | 0.66 | | Vol | | Field | | | 5/21/20 13:45 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3103842 2ND QTR 2020 FFMP-FORM 19A

PARAMETER QUALIFIERS

| Lab ID | # | Sample ID | Analytical Method | Analyte |
|---|---|-----------|-------------------|-------------------|
| 3103842001 | 1 | FFMP031W | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L. | | | | |
| 3103842001 | 2 | FFMP031W | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3103842001 | 3 | FFMP031W | SW846 9066 | Phenolics |
| The QC sample type MS for method 420.4/9066 was outside the control limits for the analyte Phenolics. The % Recovery was reported as 83.1 and the control limits were 90 to 110. | | | | |
| 3103842001 | 4 | FFMP031W | SW846 9066 | Phenolics |
| The QC sample type MSD for method 420.4/9066 was outside the control limits for the analyte Phenolics. The % Recovery was reported as 76.7 and the control limits were 90 to 110. | | | | |
| 3103842002 | 1 | FFMP002W | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L. | | | | |
| 3103842002 | 2 | FFMP002W | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3103842 2ND QTR 2020 FFMP-FORM 19A

| Lab ID | Sample ID | Analysis Method | Prep Method | Leachate Method |
|------------|-----------|-----------------|-------------|-----------------|
| 3103842001 | FFMP031W | ASTM D6919-09 | | |
| 3103842001 | FFMP031W | EPA 300.0 | | |
| 3103842001 | FFMP031W | EPA 410.4 | | |
| 3103842001 | FFMP031W | Field | | |
| 3103842001 | FFMP031W | Lib Search VOC | | |
| 3103842001 | FFMP031W | S2540C-11 | | |
| 3103842001 | FFMP031W | S4500HB-11 | | |
| 3103842001 | FFMP031W | SM2130B-2011 | | |
| 3103842001 | FFMP031W | SM2320B-2011 | | |
| 3103842001 | FFMP031W | SM2510B-2011 | | |
| 3103842001 | FFMP031W | SM5310B-2011 | | |
| 3103842001 | FFMP031W | SW846 6020A | SW846 3015 | |
| 3103842001 | FFMP031W | SW846 7470A | SW846 7470A | |
| 3103842001 | FFMP031W | SW846 8260B | | |
| 3103842001 | FFMP031W | SW846 9066 | 420.4/9066 | |
| 3103842002 | FFMP002W | ASTM D6919-09 | | |
| 3103842002 | FFMP002W | EPA 300.0 | | |
| 3103842002 | FFMP002W | EPA 410.4 | | |
| 3103842002 | FFMP002W | Field | | |
| 3103842002 | FFMP002W | Lib Search VOC | | |
| 3103842002 | FFMP002W | S2540C-11 | | |
| 3103842002 | FFMP002W | S4500HB-11 | | |
| 3103842002 | FFMP002W | SM2130B-2011 | | |
| 3103842002 | FFMP002W | SM2320B-2011 | | |
| 3103842002 | FFMP002W | SM2510B-2011 | | |
| 3103842002 | FFMP002W | SM5310B-2011 | | |
| 3103842002 | FFMP002W | SW846 6020A | SW846 3015 | |
| 3103842002 | FFMP002W | SW846 7470A | SW846 7470A | |
| 3103842002 | FFMP002W | SW846 8260B | | |
| 3103842002 | FFMP002W | SW846 9066 | 420.4/9066 | |

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Generated by ALS

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

**ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT /
SAMPLER. INSTRUCTIONS ON THE BACK.**

301 Felling Mill Road • Middletown, PA 17057 • 717-944-5541 • Fax: 717-944-1430

Client Name: Lancaster County Solid Waste MA
Address: 1299 Harrisburg Pike, P.O. Box 4424
Lancaster, PA 17604

Contact: Dan Brown

Phone#: (717) 735-0193

Project Name#: Frey Farm Annual

Bill To: Lancaster County Solid Waste MA

TAT Normal-Standard TAT is 10-12 business days.
 Rush-Subject to ALS approval and surcharges.

Date Required: _____ Approved By: _____

Email? Y N dbrown@lcswwma.org

Fax? Y No.: (717) 397-9973

Sample Description/Location (as it will appear on the lab report)

Sample Date Time

1. FFMP031W 05/21/20 1315

2. FFMP002W 05/21/20 1345

3

4

5

6

7

8

9

10

Project Comments:

LOGGED BY (signature):

REVIEWED BY (signature):

Relinquished By / Company Name

Date Time

5-21-20 1525

4

6

8

10

1 of 1



* 3 1 0 3 8 4 2 *

ed by Receiving Lab)

Cooler Temp: _____ Therm ID: _____

No. of Coolers: _____ Y _____ N _____ Initial

Custody Seals Present? _____

(If present) Seals Intact? _____

Received on Ice? _____

COCL Labels Complete/Accurate? _____

Cont. in Good Cond.? _____

Correct Containers? _____

Correct Sample Volumes? _____

Correct Preservation? _____

Headspace/Volatiles? _____

Courier/Fracking #: _____

Sample/COC Comments

**Add Subtitle D to Total Metals

ALS Field Services: Pickup Labor

Composite_Sampling Rental_Equipment

Other:

Standard

CLP-like

USACE

Special Processing

USACE

Navy

State Samples Collected In

NY

NJ

PA

NC

Sample Disposal

Lab

Special

Reportable to PADEP?

Yes

PWSID #

EBBS-Format Type

* G=Grab; C=Composite **Matrix - A=Air; DW=Drinking Water; GW=Groundwater; O=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

Rev 8/04





301 Fulling Mill Road
Middletown, PA 17057

P: (717) 944-5541

F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSUMA Work Order #: 3103842 Initials: TS Date: 5/1/20

1. Were airbills / tracking numbers present and recorded?..... NONE YES NO
Tracking number: _____
2. Are Custody Seals on shipping containers intact?..... NONE YES NO
3. Are Custody Seals on sample containers intact?..... NONE YES NO
4. Is there a COC (Chain-of-Custody) present?..... YES NO
5. Are the COC and bottle labels complete, legible and in agreement?..... YES NO
 - 5a. Does the COC contain sample locations?..... YES NO
 - 5b. Does the COC contain date and time of sample collection for all samples?..... YES NO
 - 5c. Does the COC contain sample collectors name?..... YES NO
 - 5d. Does the COC note the type(s) of preservation for all bottles?..... YES NO
 - 5e. Does the COC note the number of bottles submitted for each sample?..... YES NO
 - 5f. Does the COC note the type of sample, composite or grab?..... YES NO
 - 5g. Does the COC note the matrix of the sample(s)?..... YES NO
6. Are all aqueous samples requiring preservation preserved correctly?¹..... N/A YES NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?..... YES NO
8. Are all samples within holding times for the requested analyses?..... YES NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)..... YES NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?..... N/A YES NO
11. Were the samples received on ice?..... YES NO
12. Were sample temperatures measured at 0.0-6.0°C..... YES NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below..... YES NO
 - 13a. Are the samples required for SDWA compliance reporting?..... N/A YES NO
 - 13b. Did the client provide a SDWA PWS ID#?..... N/A YES NO
 - 13c. Are all aqueous unpreserved SDWA samples pH 5-9?..... N/A YES NO
 - 13d. Did the client provide the SDWA sample location ID/Description?..... N/A YES NO
 - 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?..... N/A YES NO

Cooler #: _____

Temperature (°C): 0 _____

Thermometer ID: 513 _____

Radiological (µCi): _____

COMMENTS (Required for all NO responses above and any sample non-conformance):

¹Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis

June 3, 2020

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

| | | | |
|-----------------|------------------|---------------|-----------------------------------|
| Project Name: | FREY FARM | Workorder: | 3104060 |
| Purchase Order: | PO1000126 | Workorder ID: | 2ND QTR 2020 FFMP-FORM 19A |

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, May 22, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

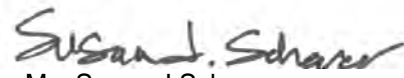
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki , Ms. Jordan Gallagher , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.



Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

| Lab ID | Sample ID | Matrix | Date Collected | Date Received | Collected By |
|------------|-------------|--------------|-----------------|-----------------|-------------------|
| 3104060001 | FFMP02SW | Ground Water | 5/22/2020 09:09 | 5/22/2020 13:53 | Mr. Brian G Shade |
| 3104060002 | FFMP02DW | Ground Water | 5/22/2020 10:19 | 5/22/2020 13:53 | Mr. Brian G Shade |
| 3104060003 | FFMP032W | Ground Water | 5/22/2020 11:11 | 5/22/2020 13:53 | Mr. Brian G Shade |
| 3104060004 | FFMP016W | Ground Water | 5/22/2020 11:28 | 5/22/2020 13:53 | Mr. Brian G Shade |
| 3104060005 | FIELD BLANK | Water | 5/22/2020 12:31 | 5/22/2020 13:53 | Mr. Brian G Shade |
| 3104060006 | TRIP BLANK | Water | 5/22/2020 13:53 | 5/22/2020 13:53 | Mr. Brian G Shade |

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SAMPLE SUMMARY

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

| | |
|--------|--|
| J | Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte |
| U | Indicates that the analyte was Not Detected (ND) |
| N | Indicates presumptive evidence of the presence of a compound |
| MDL | Method Detection Limit |
| PQL | Practical Quantitation Limit |
| RDL | Reporting Detection Limit |
| ND | Not Detected - indicates that the analyte was Not Detected at the RDL |
| Cntr | Analysis was performed using this container |
| RegLmt | Regulatory Limit |
| LCS | Laboratory Control Sample |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| DUP | Sample Duplicate |
| %Rec | Percent Recovery |
| RPD | Relative Percent Difference |
| LOD | DoD Limit of Detection |
| LOQ | DoD Limit of Quantitation |
| DL | DoD Detection Limit |
| I | Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL) |
| (S) | Surrogate Compound |
| NC | Not Calculated |
| * | Result outside of QC limits |

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060001** Date Collected: 5/22/2020 09:09 Matrix: Ground Water
Sample ID: **FFMP02SW** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Bromochloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060001** Date Collected: 5/22/2020 09:09 Matrix: Ground Water
Sample ID: **FFMP02SW** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 103 | | % | 62 - 133 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| 4-Bromofluorobenzene (S) | 103 | | % | 79 - 114 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Dibromofluoromethane (S) | 99.8 | | % | 78 - 116 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |
| Toluene-d8 (S) | 94.5 | | % | 76 - 127 | SW846 8260B | | | 5/27/20 14:02 | DPC | J |

LIBRARY SEARCH - VOLATILES

No TIC's Detected . Lib Search VOC 5/27/20 14:02 CPK J

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 17 | | mg/L | 5 | SM2320B-2011 | | | 5/27/20 21:30 | R2B | B |
| Alkalinity, Total | 17 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/27/20 21:30 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/31/20 03:52 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/29/20 00:58 | JAM | C |
| Chloride | 66.4 | | mg/L | 2.0 | EPA 300.0 | | | 5/23/20 08:06 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/23/20 08:06 | MBW | B |
| Nitrate-N | 15.2 | | mg/L | 0.20 | EPA 300.0 | | | 5/23/20 08:06 | MBW | B |
| pH | 5.89 | 2 | pH_Units | | S4500HB-11 | | | 5/27/20 21:30 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/26/20 12:30 | VXF | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 476 | | umhos/cm | 1 | SM2510B-2011 | | | 5/27/20 21:30 | R2B | B |
| Sulfate | 30.3 | | mg/L | 2.0 | EPA 300.0 | | | 5/23/20 08:06 | MBW | B |
| Total Dissolved Solids | 282 | | mg/L | 25 | S2540C-11 | | | 5/26/20 11:10 | LXW | B |
| Total Organic Carbon (TOC) | 3.2 | | mg/L | 0.50 | SM5310B-2011 | | | 6/3/20 05:14 | PAG | G |
| Turbidity | 15.4 | | NTU | 0.10 | SM2130B-2011 | | | 5/23/20 07:36 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060001** Date Collected: 5/22/2020 09:09 Matrix: Ground Water
Sample ID: **FFMP02SW** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| Barium, Total | 0.089 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Barium, Dissolved | 0.082 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Cadmium, Total | 0.0011 | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| Calcium, Total | 17.4 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Calcium, Dissolved | 17.3 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| Chromium, Total | 0.013 | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Copper, Total | 0.012 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Copper, Dissolved | 0.0077 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| Iron, Total | 1.1 | | mg/L | 0.056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| Magnesium, Total | 7.1 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Magnesium, Dissolved | 7.1 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| Manganese, Total | 0.021 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Manganese, Dissolved | 0.016 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 13:07 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 14:32 | AHI | D |
| Nickel, Total | 0.010 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Potassium, Total | 4.4 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Potassium, Dissolved | 4.4 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| Sodium, Total | 52.1 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Sodium, Dissolved | 52.6 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |
| Zinc, Total | 0.016 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:03 | MSA | E1 |

ALS Environmental Laboratory Locations Across North America

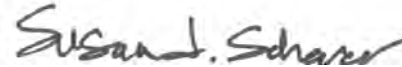
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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060001** Date Collected: 5/22/2020 09:09 Matrix: Ground Water
 Sample ID: **FFMP02SW** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | 0.014 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:24 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 14.85 | | Feet | | Field | | | 5/22/20 09:09 | BGS | F |
| Elev Top MW Casing above MSL | 509.90 | | Feet | | Field | | | 5/22/20 09:09 | BGS | F |
| Flow Rate | 0.27 | | gal/min | | Field | | | 5/22/20 09:09 | BGS | F |
| Ground Water Elevation | 495.05 | | ft/MSL | | Field | | | 5/22/20 09:09 | BGS | F |
| pH, Field (SM4500B) | 5.34 | | pH_Units | | Field | | | 5/22/20 09:09 | BGS | F |
| Sample Depth | 18.00 | | Feet | | Field | | | 5/22/20 09:09 | BGS | F |
| Specific Conductance, Field | 505 | | umhos/cm | 1 | Field | | | 5/22/20 09:09 | BGS | F |
| Temperature | 10.53 | | Deg. C | | Field | | | 5/22/20 09:09 | BGS | F |
| Total Well Depth | 22.70 | | Feet | | Field | | | 5/22/20 09:09 | BGS | F |
| Volume in Water Column | 5.10 | | Gallons | | Field | | | 5/22/20 09:09 | BGS | F |
| Water Level After Purge | 16.85 | | Feet | | Field | | | 5/22/20 09:09 | BGS | F |
| Well Volumes Purged | 0.32 | | Vol | | Field | | | 5/22/20 09:09 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060002** Date Collected: 5/22/2020 10:19 Matrix: Ground Water
Sample ID: **FFMP02DW** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|-------------|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Bromochloromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | 5/27/20 14:24 | DPC | J |

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3104060002** Date Collected: 5/22/2020 10:19 Matrix: Ground Water
 Sample ID: **FFMP02DW** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 103 | | % | 62 - 133 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| 4-Bromofluorobenzene (S) | 102 | | % | 79 - 114 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| Dibromofluoromethane (S) | 101 | | % | 78 - 116 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |
| Toluene-d8 (S) | 94.1 | | % | 76 - 127 | SW846 8260B | | | 5/27/20 14:24 | DPC | J |

LIBRARY SEARCH - VOLATILES

No TIC's Detected . Lib Search VOC 5/27/20 14:24 CPK J

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|------|-----|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 113 | | mg/L | 5 | SM2320B-2011 | | | 5/27/20 21:30 | R2B | B |
| Alkalinity, Total | 113 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/27/20 21:30 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/30/20 06:16 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/29/20 00:58 | JAM | C |
| Chloride | 318 | | mg/L | 5.0 | EPA 300.0 | | | 5/28/20 05:19 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/23/20 09:11 | MBW | B |
| Nitrate-N | 8.5 | | mg/L | 0.20 | EPA 300.0 | | | 5/23/20 09:11 | MBW | B |
| pH | 7.65 | 2,3 | pH_Units | | S4500HB-11 | | | 5/27/20 21:30 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/26/20 12:30 | VXF | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 1340 | | umhos/cm | 1 | SM2510B-2011 | | | 5/27/20 21:30 | R2B | B |
| Sulfate | 30.9 | | mg/L | 2.0 | EPA 300.0 | | | 5/23/20 09:11 | MBW | B |
| Total Dissolved Solids | 882 | 4 | mg/L | 25 | S2540C-11 | | | 5/27/20 11:45 | KXH | B |
| Total Organic Carbon (TOC) | 0.61 | | mg/L | 0.50 | SM5310B-2011 | | | 6/3/20 05:14 | PAG | G |
| Turbidity | 7.49 | | NTU | 0.10 | SM2130B-2011 | | | 5/23/20 07:36 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060002**

Date Collected: 5/22/2020 10:19

Matrix: Ground Water

Sample ID: **FFMP02DW**

Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| Barium, Total | 0.15 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Barium, Dissolved | 0.15 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| Calcium, Total | 104 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Calcium, Dissolved | 102 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| Iron, Total | 0.68 | | mg/L | 0.056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Iron, Dissolved | 0.060 | | mg/L | 0.056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| Magnesium, Total | 17.6 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Magnesium, Dissolved | 17.4 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| Manganese, Total | 0.42 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Manganese, Dissolved | 0.43 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 13:08 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 14:33 | AHI | D |
| Nickel, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Potassium, Total | 1.7 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Potassium, Dissolved | 1.7 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| Sodium, Total | 107 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Sodium, Dissolved | 105 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |
| Zinc, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:06 | MSA | E1 |

ALS Environmental Laboratory Locations Across North America

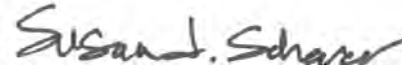
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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060002** Date Collected: 5/22/2020 10:19 Matrix: Ground Water
 Sample ID: **FFMP02DW** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:48 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 19.65 | | Feet | | Field | | | 5/22/20 10:19 | BGS | F |
| Elev Top MW Casing above MSL | 509.60 | | Feet | | Field | | | 5/22/20 10:19 | BGS | F |
| Flow Rate | 1.63 | | gal/min | | Field | | | 5/22/20 10:19 | BGS | F |
| Ground Water Elevation | 489.95 | | ft/MSL | | Field | | | 5/22/20 10:19 | BGS | F |
| pH, Field (SM4500B) | 7.81 | | pH_Units | | Field | | | 5/22/20 10:19 | BGS | F |
| Sample Depth | 120.00 | | Feet | | Field | | | 5/22/20 10:19 | BGS | F |
| Specific Conductance, Field | 17 | | umhos/cm | 1 | Field | | | 5/22/20 10:19 | BGS | F |
| Temperature | 13.41 | | Deg. C | | Field | | | 5/22/20 10:19 | BGS | F |
| Total Well Depth | 153.00 | | Feet | | Field | | | 5/22/20 10:19 | BGS | F |
| Volume in Water Column | 196.02 | | Gallons | | Field | | | 5/22/20 10:19 | BGS | F |
| Water Level After Purge | 48.50 | | Feet | | Field | | | 5/22/20 10:19 | BGS | F |
| Well Volumes Purged | 0.50 | | Vol | | Field | | | 5/22/20 10:19 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060003** Date Collected: 5/22/2020 11:11 Matrix: Ground Water
Sample ID: **FFMP032W** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|-------------|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Bromochloromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | 5/27/20 14:47 | DPC | J |

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3104060003**

Date Collected: 5/22/2020 11:11

Matrix: Ground Water

 Sample ID: **FFMP032W**

Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 103 | | % | 62 - 133 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| 4-Bromofluorobenzene (S) | 104 | | % | 79 - 114 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| Dibromofluoromethane (S) | 102 | | % | 78 - 116 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |
| Toluene-d8 (S) | 94.7 | | % | 76 - 127 | SW846 8260B | | | 5/27/20 14:47 | DPC | J |

LIBRARY SEARCH - VOLATILES

No TIC's Detected . Lib Search VOC 5/27/20 14:47 CPK J

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|-------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 64 | | mg/L | 5 | SM2320B-2011 | | | 5/27/20 21:30 | R2B | B |
| Alkalinity, Total | 64 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/27/20 21:30 | R2B | A |
| Ammonia-N | 0.612 | | mg/L | 0.100 | ASTM D6919-09 | | | 5/30/20 06:57 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/29/20 00:58 | JAM | C |
| Chloride | 20.4 | | mg/L | 2.0 | EPA 300.0 | | | 5/23/20 09:28 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/23/20 09:28 | MBW | B |
| Nitrate-N | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/23/20 09:28 | MBW | B |
| pH | 7.18 | 2 | pH_Units | | S4500HB-11 | | | 5/27/20 21:30 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/26/20 12:30 | VXF | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 191 | | umhos/cm | 1 | SM2510B-2011 | | | 5/27/20 21:30 | R2B | B |
| Sulfate | ND | | mg/L | 2.0 | EPA 300.0 | | | 5/23/20 09:28 | MBW | B |
| Total Dissolved Solids | 116 | 3 | mg/L | 25 | S2540C-11 | | | 5/27/20 13:22 | KXH | B |
| Total Organic Carbon (TOC) | ND | | mg/L | 0.50 | SM5310B-2011 | | | 6/3/20 05:14 | PAG | G |
| Turbidity | 139 | | NTU | 0.10 | SM2130B-2011 | | | 5/23/20 07:36 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060003**

Date Collected: 5/22/2020 11:11

Matrix: Ground Water

Sample ID: **FFMP032W**

Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| Barium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Barium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| Calcium, Total | 13.3 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Calcium, Dissolved | 13.1 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| Iron, Total | 10.6 | | mg/L | 0.056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Iron, Dissolved | 4.9 | | mg/L | 0.056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| Magnesium, Total | 5.2 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Magnesium, Dissolved | 5.1 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| Manganese, Total | 0.50 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Manganese, Dissolved | 0.49 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 13:12 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 14:34 | AHI | D |
| Nickel, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Potassium, Total | 1.3 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Potassium, Dissolved | 1.3 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| Sodium, Total | 12.5 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Sodium, Dissolved | 12.7 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |
| Zinc, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:10 | MSA | E1 |

ALS Environmental Laboratory Locations Across North America

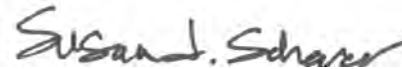
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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060003** Date Collected: 5/22/2020 11:11 Matrix: Ground Water
 Sample ID: **FFMP032W** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:51 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 49.35 | | Feet | | Field | | | 5/22/20 11:11 | BGS | F |
| Elev Top MW Casing above MSL | 594.09 | | Feet | | Field | | | 5/22/20 11:11 | BGS | F |
| Flow Rate | 0.96 | | gal/min | | Field | | | 5/22/20 11:11 | BGS | F |
| Ground Water Elevation | 544.74 | | ft/MSL | | Field | | | 5/22/20 11:11 | BGS | F |
| pH, Field (SM4500B) | 6.94 | | pH_Units | | Field | | | 5/22/20 11:11 | BGS | F |
| Sample Depth | 62.00 | | Feet | | Field | | | 5/22/20 11:11 | BGS | F |
| Specific Conductance, Field | 209 | | umhos/cm | 1 | Field | | | 5/22/20 11:11 | BGS | F |
| Temperature | 11.64 | | Deg. C | | Field | | | 5/22/20 11:11 | BGS | F |
| Total Well Depth | 77.60 | | Feet | | Field | | | 5/22/20 11:11 | BGS | F |
| Volume in Water Column | 41.53 | | Gallons | | Field | | | 5/22/20 11:11 | BGS | F |
| Water Level After Purge | 57.17 | | Feet | | Field | | | 5/22/20 11:11 | BGS | F |
| Well Volumes Purged | 0.81 | | Vol | | Field | | | 5/22/20 11:11 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060004** Date Collected: 5/22/2020 11:28 Matrix: Ground Water
Sample ID: **FFMP016W** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|-------------|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Bromochloromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | 5/27/20 15:10 | DPC | J |

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3104060004**

Date Collected: 5/22/2020 11:28

Matrix: Ground Water

 Sample ID: **FFMP016W**

Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 103 | | % | 62 - 133 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| 4-Bromofluorobenzene (S) | 104 | | % | 79 - 114 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| Dibromofluoromethane (S) | 101 | | % | 78 - 116 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |
| Toluene-d8 (S) | 93.8 | | % | 76 - 127 | SW846 8260B | | | 5/27/20 15:10 | DPC | J |

LIBRARY SEARCH - VOLATILES

No TIC's Detected . Lib Search VOC 5/27/20 15:10 CPK J

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 33 | | mg/L | 5 | SM2320B-2011 | | | 5/27/20 21:30 | R2B | B |
| Alkalinity, Total | 33 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/27/20 21:30 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/31/20 04:05 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/29/20 00:58 | JAM | C |
| Chloride | 76.7 | | mg/L | 2.0 | EPA 300.0 | | | 5/23/20 09:44 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/23/20 09:44 | MBW | B |
| Nitrate-N | 9.1 | | mg/L | 0.20 | EPA 300.0 | | | 5/23/20 09:44 | MBW | B |
| pH | 6.29 | 2 | pH_Units | | S4500HB-11 | | | 5/27/20 21:30 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/26/20 12:30 | VXF | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 496 | | umhos/cm | 1 | SM2510B-2011 | | | 5/27/20 21:30 | R2B | B |
| Sulfate | 31.8 | | mg/L | 2.0 | EPA 300.0 | | | 5/23/20 09:44 | MBW | B |
| Total Dissolved Solids | 284 | | mg/L | 25 | S2540C-11 | | | 5/27/20 13:22 | KXH | B |
| Total Organic Carbon (TOC) | 0.82 | | mg/L | 0.50 | SM5310B-2011 | | | 6/3/20 05:14 | PAG | G |
| Turbidity | ND | | NTU | 0.10 | SM2130B-2011 | | | 5/23/20 07:36 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060004** Date Collected: 5/22/2020 11:28 Matrix: Ground Water
Sample ID: **FFMP016W** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| Barium, Total | 0.061 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Barium, Dissolved | 0.062 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| Calcium, Total | 31.5 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Calcium, Dissolved | 31.4 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| Iron, Total | 0.062 | | mg/L | 0.056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| Magnesium, Total | 15.3 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Magnesium, Dissolved | 14.9 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| Manganese, Total | 0.012 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Manganese, Dissolved | 0.012 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 13:13 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 14:36 | AHI | D |
| Nickel, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Potassium, Total | 2.3 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Potassium, Dissolved | 2.3 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| Sodium, Total | 26.8 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Sodium, Dissolved | 26.9 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |
| Zinc, Total | 0.0070 | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:13 | MSA | E1 |

ALS Environmental Laboratory Locations Across North America

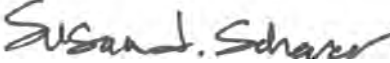
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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060004** Date Collected: 5/22/2020 11:28 Matrix: Ground Water
 Sample ID: **FFMP016W** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | 0.015 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:55 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 22.57 | | Feet | | Field | | | 5/22/20 11:28 | BGS | F |
| Elev Top MW Casing above MSL | 474.60 | | Feet | | Field | | | 5/22/20 11:28 | BGS | F |
| Ground Water Elevation | 452.03 | | ft/MSL | | Field | | | 5/22/20 11:28 | BGS | F |
| pH, Field (SM4500B) | 5.85 | | pH_Units | | Field | | | 5/22/20 11:28 | BGS | F |
| Sample Depth | 135.00 | | Feet | | Field | | | 5/22/20 11:28 | BGS | F |
| Specific Conductance, Field | 510 | | umhos/cm | 1 | Field | | | 5/22/20 11:28 | BGS | F |
| Temperature | 9.64 | | Deg. C | | Field | | | 5/22/20 11:28 | BGS | F |
| Total Well Depth | 149.80 | | Feet | | Field | | | 5/22/20 11:28 | BGS | F |
| Volume in Water Column | 0.00 | | Gallons | | Field | | | 5/22/20 11:28 | BGS | F |


 Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060005** Date Collected: 5/22/2020 12:31 Matrix: Water
Sample ID: **FIELD BLANK** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|-------------|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Bromochloromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | 5/27/20 11:44 | DPC | J |

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

| | | |
|-------------------------------|---------------------------------|---------------|
| Lab ID: 3104060005 | Date Collected: 5/22/2020 12:31 | Matrix: Water |
| Sample ID: FIELD BLANK | Date Received: 5/22/2020 13:53 | |

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 101 | | % | 62 - 133 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| 4-Bromofluorobenzene (S) | 105 | | % | 79 - 114 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| Dibromofluoromethane (S) | 102 | | % | 78 - 116 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |
| Toluene-d8 (S) | 93.6 | | % | 76 - 127 | SW846 8260B | | | 5/27/20 11:44 | DPC | J |

LIBRARY SEARCH - VOLATILES

| | | | | |
|-------------------|----------------|---------------|-----|---|
| No TIC's Detected | Lib Search VOC | 5/27/20 11:44 | CPK | J |
|-------------------|----------------|---------------|-----|---|

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | ND | | mg/L | 5 | SM2320B-2011 | | | 5/27/20 21:30 | R2B | B |
| Alkalinity, Total | ND | 1 | mg/L | 5 | SM2320B-2011 | | | 5/27/20 21:30 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/31/20 10:58 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/29/20 00:58 | JAM | C |
| Chloride | ND | | mg/L | 1.0 | EPA 300.0 | | | 5/23/20 10:01 | MBW | B |
| Fluoride | ND | | mg/L | 0.10 | EPA 300.0 | | | 5/23/20 10:01 | MBW | B |
| Nitrate-N | ND | | mg/L | 0.10 | EPA 300.0 | | | 5/23/20 10:01 | MBW | B |
| pH | 4.84 | 2 | pH_Units | | S4500HB-11 | | | 5/27/20 21:30 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/26/20 12:30 | VXF | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 2 | | umhos/cm | 1 | SM2510B-2011 | | | 5/27/20 21:30 | R2B | B |
| Sulfate | ND | | mg/L | 1.0 | EPA 300.0 | | | 5/23/20 10:01 | MBW | B |
| Total Dissolved Solids | ND | | mg/L | 25 | S2540C-11 | | | 5/27/20 13:22 | KXH | B |
| Total Organic Carbon (TOC) | ND | | mg/L | 0.50 | SM5310B-2011 | | | 6/3/20 05:14 | PAG | G |
| Turbidity | 0.11 | | NTU | 0.10 | SM2130B-2011 | | | 5/23/20 07:36 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060005**
Sample ID: **FIELD BLANK**

Date Collected: 5/22/2020 12:31 Matrix: Water
Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |
| Barium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Barium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |
| Calcium, Total | 0.15 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Calcium, Dissolved | 0.16 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |
| Iron, Total | ND | | mg/L | 0.056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |
| Magnesium, Total | ND | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Magnesium, Dissolved | ND | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |
| Manganese, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Manganese, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 13:14 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 14:37 | AHI | D |
| Nickel, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Potassium, Total | ND | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Potassium, Dissolved | ND | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |
| Sodium, Total | 0.19 | | mg/L | 0.11 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Sodium, Dissolved | 0.24 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |
| Zinc, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/27/20 17:50 | AHI | 5/28/20 06:16 | MSA | E1 |

ALS Environmental Laboratory Locations Across North America

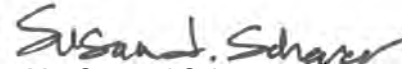
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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060005** Date Collected: 5/22/2020 12:31 Matrix: Water
 Sample ID: **FIELD BLANK** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------|---------|------|-------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:58 | MSA | D1 |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3104060006** Date Collected: 5/22/2020 13:53 Matrix: Water
Sample ID: **TRIP BLANK** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Bromochloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |

ALS Environmental Laboratory Locations Across North America

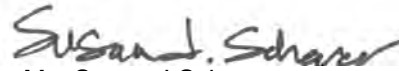
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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3104060006** Date Collected: 5/22/2020 13:53 Matrix: Water
 Sample ID: **TRIP BLANK** Date Received: 5/22/2020 13:53

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------------|---------|------|-------|----------|----------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 103 | | % | 62 - 133 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| 4-Bromofluorobenzene (S) | 105 | | % | 79 - 114 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Dibromofluoromethane (S) | 102 | | % | 78 - 116 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| Toluene-d8 (S) | 94.1 | | % | 76 - 127 | SW846 8260B | | | 5/27/20 12:07 | DPC | A |
| LIBRARY SEARCH - VOLATILES | | | | | | | | | | |
| No TIC's Detected | . | | | | Lib Search VOC | | | 5/27/20 12:07 | CPK | A |


 Ms. Susan J Scherer
 Project Coordinator

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 Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

ANALYTICAL RESULTS

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

PARAMETER QUALIFIERS

| Lab ID | # | Sample ID | Analytical Method | Analyte |
|---|---|-------------|-------------------|------------------------|
| 3104060001 | 1 | FFMP02SW | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L. | | | | |
| 3104060001 | 2 | FFMP02SW | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3104060002 | 1 | FFMP02DW | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L. | | | | |
| 3104060002 | 2 | FFMP02DW | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3104060002 | 3 | FFMP02DW | S4500HB-11 | pH |
| The QC sample type DUP for method SM4500H+B was outside the control limits for the analyte pH. The Recovery was reported as 0.122 and the control limits were 0.100 pH units. | | | | |
| 3104060002 | 4 | FFMP02DW | S2540C-11 | Total Dissolved Solids |
| The QC sample type DUP for method S2540C-11 was outside the control limits for the analyte Total Dissolved Solids. The RPD was reported as 11.3 and the upper control limit is 5. | | | | |
| 3104060003 | 1 | FFMP032W | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L. | | | | |
| 3104060003 | 2 | FFMP032W | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3104060003 | 3 | FFMP032W | S2540C-11 | Total Dissolved Solids |
| The QC sample type DUP for method S2540C-11 was outside the control limits for the analyte Total Dissolved Solids. The RPD was reported as 16.8 and the upper control limit is 5. | | | | |
| 3104060004 | 1 | FFMP016W | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L. | | | | |
| 3104060004 | 2 | FFMP016W | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3104060005 | 1 | FIELD BLANK | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L. | | | | |
| 3104060005 | 2 | FIELD BLANK | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |

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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

| Lab ID | Sample ID | Analysis Method | Prep Method | Leachate Method |
|------------|-----------|-----------------|-------------|-----------------|
| 3104060001 | FFMP02SW | ASTM D6919-09 | | |
| 3104060001 | FFMP02SW | EPA 300.0 | | |
| 3104060001 | FFMP02SW | EPA 410.4 | | |
| 3104060001 | FFMP02SW | Field | | |
| 3104060001 | FFMP02SW | Lib Search VOC | | |
| 3104060001 | FFMP02SW | S2540C-11 | | |
| 3104060001 | FFMP02SW | S4500HB-11 | | |
| 3104060001 | FFMP02SW | SM2130B-2011 | | |
| 3104060001 | FFMP02SW | SM2320B-2011 | | |
| 3104060001 | FFMP02SW | SM2510B-2011 | | |
| 3104060001 | FFMP02SW | SM5310B-2011 | | |
| 3104060001 | FFMP02SW | SW846 6020A | SW846 3015 | |
| 3104060001 | FFMP02SW | SW846 7470A | SW846 7470A | |
| 3104060001 | FFMP02SW | SW846 8260B | | |
| 3104060001 | FFMP02SW | SW846 9066 | 420.4/9066 | |
| 3104060002 | FFMP02DW | ASTM D6919-09 | | |
| 3104060002 | FFMP02DW | EPA 300.0 | | |
| 3104060002 | FFMP02DW | EPA 410.4 | | |
| 3104060002 | FFMP02DW | Field | | |
| 3104060002 | FFMP02DW | Lib Search VOC | | |
| 3104060002 | FFMP02DW | S2540C-11 | | |
| 3104060002 | FFMP02DW | S4500HB-11 | | |
| 3104060002 | FFMP02DW | SM2130B-2011 | | |
| 3104060002 | FFMP02DW | SM2320B-2011 | | |
| 3104060002 | FFMP02DW | SM2510B-2011 | | |
| 3104060002 | FFMP02DW | SM5310B-2011 | | |
| 3104060002 | FFMP02DW | SW846 6020A | SW846 3015 | |
| 3104060002 | FFMP02DW | SW846 7470A | SW846 7470A | |
| 3104060002 | FFMP02DW | SW846 8260B | | |
| 3104060002 | FFMP02DW | SW846 9066 | 420.4/9066 | |
| 3104060003 | FFMP032W | ASTM D6919-09 | | |
| 3104060003 | FFMP032W | EPA 300.0 | | |
| 3104060003 | FFMP032W | EPA 410.4 | | |
| 3104060003 | FFMP032W | Field | | |
| 3104060003 | FFMP032W | Lib Search VOC | | |
| 3104060003 | FFMP032W | S2540C-11 | | |
| 3104060003 | FFMP032W | S4500HB-11 | | |
| 3104060003 | FFMP032W | SM2130B-2011 | | |
| 3104060003 | FFMP032W | SM2320B-2011 | | |
| 3104060003 | FFMP032W | SM2510B-2011 | | |
| 3104060003 | FFMP032W | SM5310B-2011 | | |
| 3104060003 | FFMP032W | SW846 6020A | SW846 3015 | |
| 3104060003 | FFMP032W | SW846 7470A | SW846 7470A | |
| 3104060003 | FFMP032W | SW846 8260B | | |
| 3104060003 | FFMP032W | SW846 9066 | 420.4/9066 | |
| 3104060004 | FFMP016W | ASTM D6919-09 | | |

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 Vancouver Waterloo · Winnipeg · Yellowknife **United States:** Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York **Mexico:** Monterrey

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3104060 2ND QTR 2020 FFMP-FORM 19A

| Lab ID | Sample ID | Analysis Method | Prep Method | Leachate Method |
|------------|-------------|-----------------|-------------|-----------------|
| 3104060004 | FFMP016W | EPA 300.0 | | |
| 3104060004 | FFMP016W | EPA 410.4 | | |
| 3104060004 | FFMP016W | Field | | |
| 3104060004 | FFMP016W | Lib Search VOC | | |
| 3104060004 | FFMP016W | S2540C-11 | | |
| 3104060004 | FFMP016W | S4500HB-11 | | |
| 3104060004 | FFMP016W | SM2130B-2011 | | |
| 3104060004 | FFMP016W | SM2320B-2011 | | |
| 3104060004 | FFMP016W | SM2510B-2011 | | |
| 3104060004 | FFMP016W | SM5310B-2011 | | |
| 3104060004 | FFMP016W | SW846 6020A | SW846 3015 | |
| 3104060004 | FFMP016W | SW846 7470A | SW846 7470A | |
| 3104060004 | FFMP016W | SW846 8260B | | |
| 3104060004 | FFMP016W | SW846 9066 | 420.4/9066 | |
| 3104060005 | FIELD BLANK | ASTM D6919-09 | | |
| 3104060005 | FIELD BLANK | EPA 300.0 | | |
| 3104060005 | FIELD BLANK | EPA 410.4 | | |
| 3104060005 | FIELD BLANK | Lib Search VOC | | |
| 3104060005 | FIELD BLANK | S2540C-11 | | |
| 3104060005 | FIELD BLANK | S4500HB-11 | | |
| 3104060005 | FIELD BLANK | SM2130B-2011 | | |
| 3104060005 | FIELD BLANK | SM2320B-2011 | | |
| 3104060005 | FIELD BLANK | SM2510B-2011 | | |
| 3104060005 | FIELD BLANK | SM5310B-2011 | | |
| 3104060005 | FIELD BLANK | SW846 6020A | SW846 3015 | |
| 3104060005 | FIELD BLANK | SW846 7470A | SW846 7470A | |
| 3104060005 | FIELD BLANK | SW846 8260B | | |
| 3104060005 | FIELD BLANK | SW846 9066 | 420.4/9066 | |
| 3104060006 | TRIP BLANK | Lib Search VOC | | |
| 3104060006 | TRIP BLANK | SW846 8260B | | |

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**CHAIN OF CUSTODY/
 REQUEST FOR ANALYSIS**
**ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT/
 SAMPLER. INSTRUCTIONS ON THE BACK.**

Generated by ALS
 1 of 1
 * 3 1 D 4 0 6 0 *

Client Name: Lancaster County Solid Waste MA
 Address: 1299 Harrisburg Pike, P.O. Box 4424
 Lancaster, PA 17604
 Contact: Dan Brown
 Phone#: (717) 735-0193
 Project Name#: Frey Farm Annual
 Bill To: Lancaster County Solid Waste MA

TAT Normal-Standard TAT is 10-12 business days.
 Rush-Subject to ALS approval and surcharges.
 Date Required: Y Y No. (717) 397-9973
 Email? Y Y dbrown@lcswwma.org
 Approved By: _____

| Container Type | AG | AW | CG | PL | PL | PL | PL | PL |
|----------------|-------|--------|-------|--------|--------|--------|--------|--------|
| 40 ml | 40 ml | 125 ml | 40 ml | 250 ml | 125 ml | 125 ml | 500 ml | 500 ml |
| HCl | H2SO4 | HCl | H2SO4 | HNO3 | HNO3 | HNO3 | None | None |

Cooler Temp: 2°C Therm ID: 29 Initial
 No. of Coolers: Y N
 Custody Seals Present? (if present) Seals Intact? Received on Ice? COC Labels Complete/Accurate? Cont. in Good Cond.? Correct Containers? Correct Sample Volumes? Correct Preservation? Headspace/Volatiles?

| Sample Description/Location (as it will appear on the lab report) | Matrix | G or C | Enter Number of Containers Per Sample or Field Results Below. | | | | | | | | | | ALS Field Services: <input type="checkbox"/> Pickup <input type="checkbox"/> Labor <input type="checkbox"/> Composite_Sampling <input type="checkbox"/> Rental_Equipment <input type="checkbox"/> Other | | |
|---|--------|--------|---|------|-----------------------------|--------------------|---------------------------|------------|---|---|--------------------------------------|------------------|---|---|------------------------------------|
| | | | TOC | O-OH | VOC (Form 19A) + Subtitle D | Field Measurements | Sample Depth for AUX Data | NH3-N, COD | Dissoved: Fe, Mn, Na, Ba, Cr, Cu, Pb, Mg, K, Zn, As, Cd, Se, Ag, Hg, Ca | Metals: Fe, Mn, Na, Ba, Cr, Cu, Pb, Mg, K, Zn, As, Cd, Se, Ag, Hg, Ca | PH, Cl, SPC, F, SO4, TDS, NO3, Turb. | Alkalinity, HCO3 | | | |
| 1. FFMP02SW | GW | G | 2 | 1 | 2 | X | X | 1 | 1 | 1 | 1 | 1 | 1 | 1 | **Add Subtitle D to Total Metals |
| 2. FFMP02DW | GW | G | 2 | 1 | 2 | X | X | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 3. FFMP032W | GW | G | 2 | 1 | 2 | X | X | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 4. FFMP016W | GW | G | 2 | 1 | 2 | X | X | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 5. Field Blank | GW | G | 2 | 1 | 2 | X | X | 1 | 1 | 1 | 1 | 1 | 1 | 1 | FB line end |
| 6. np Blank | GW | G | 2 | 1 | 2 | X | X | 1 | 1 | 1 | 1 | 1 | 1 | 1 | FB not received by lab COC 5/22 |
| 7. | | | | | | | | | | | | | | | |
| 8. | | | | | | | | | | | | | | | |
| 9. | | | | | | | | | | | | | | | |
| 10. | | | | | | | | | | | | | | | |

Project Comments: _____
 Relinquished By / Company Name: _____
 Date: 5-22-20 1353
 Received By / Company Name: Alan N. Stebbins
 Date: 5/20/20

Reportable to PADEP? Yes No
 PWSID # _____
 EDDS: Format Type- _____

* G=Grab; C=Composite ** Matrix - Air=Air; DW=Drinking Water; GW=Groundwater; Oil=Oil; LI=Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
 ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057





301 Fulling Mill Road
Middletown, PA 17057

P: (717) 944-5541

F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSWMA Work Order #: 3104060 Initials: COM Date: 5/22/2020

1. Were airbills / tracking numbers present and recorded?..... NONE YES NO
Tracking number: _____
2. Are Custody Seals on shipping containers intact?..... NONE YES NO
3. Are Custody Seals on sample containers intact?..... NONE YES NO
4. Is there a COC (Chain-of-Custody) present?..... YES NO
5. Are the COC and bottle labels complete, legible and in agreement?..... YES NO
 - 5a. Does the COC contain sample locations?..... YES NO
 - 5b. Does the COC contain date and time of sample collection for all samples?..... YES NO
 - 5c. Does the COC contain sample collectors name?..... YES NO
 - 5d. Does the COC note the type(s) of preservation for all bottles?..... YES NO
 - 5e. Does the COC note the number of bottles submitted for each sample?..... YES NO
 - 5f. Does the COC note the type of sample, composite or grab?..... YES NO
 - 5g. Does the COC note the matrix of the sample(s)?..... YES NO
6. Are all aqueous samples requiring preservation preserved correctly?..... N/A YES NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?..... YES NO
8. Are all samples within holding times for the requested analyses?..... off out of hold YES NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)..... YES NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?..... N/A YES NO
11. Were the samples received on ice?..... YES NO
12. Were sample temperatures measured at 0.0-6.0°C..... YES NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below..... YES NO
 - 13a. Are the samples required for SDWA compliance reporting?..... N/A YES NO
 - 13b. Did the client provide a SDWA PWS ID#?..... N/A YES NO
 - 13c. Are all aqueous unpreserved SDWA samples pH 5-9?..... N/A YES NO
 - 13d. Did the client provide the SDWA sample location ID/Description?..... N/A YES NO
 - 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?..... N/A YES NO

Cooler #: _____
 Temperature (°C): 2°C
 Thermometer ID: 309
 Radiological (µCi): _____

COMMENTS (Required for all NO responses above and any sample non-conformance):
FB samples and TB not received COM 5/22 8/25/20

*Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis

June 3, 2020

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

| | | | |
|-----------------|------------------|---------------|-----------------------------------|
| Project Name: | FREY FARM | Workorder: | 3103620 |
| Purchase Order: | PO1000126 | Workorder ID: | 2ND QTR 2020 FFMP-FORM 19A |

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, May 20, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

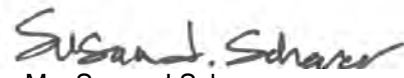
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki , Ms. Jordan Gallagher , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.



Ms. Susan J Scherer
Project Coordinator

ALS Environmental Laboratory Locations Across North America

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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

SAMPLE SUMMARY

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

| Lab ID | Sample ID | Matrix | Date Collected | Date Received | Collected By |
|------------|-----------|--------------|-----------------|-----------------|-------------------|
| 3103620001 | FFMP005W | Ground Water | 5/20/2020 10:17 | 5/20/2020 15:54 | Mr. Brian G Shade |
| 3103620002 | FFMP26RW | Ground Water | 5/20/2020 11:49 | 5/20/2020 15:54 | Mr. Brian G Shade |
| 3103620003 | FFMP03AW | Ground Water | 5/20/2020 13:03 | 5/20/2020 15:54 | Mr. Brian G Shade |
| 3103620004 | FFMP018W | Ground Water | 5/20/2020 13:52 | 5/20/2020 15:54 | Mr. Brian G Shade |
| 3103620005 | FFMP019W | Ground Water | 5/20/2020 14:36 | 5/20/2020 15:54 | Mr. Brian G Shade |

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Vancouver Waterloo · Winnipeg · Yellowknife **United States:** Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York **Mexico:** Monterrey

SAMPLE SUMMARY

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

| | |
|--------|--|
| J | Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte |
| U | Indicates that the analyte was Not Detected (ND) |
| N | Indicates presumptive evidence of the presence of a compound |
| MDL | Method Detection Limit |
| PQL | Practical Quantitation Limit |
| RDL | Reporting Detection Limit |
| ND | Not Detected - indicates that the analyte was Not Detected at the RDL |
| Cntr | Analysis was performed using this container |
| RegLmt | Regulatory Limit |
| LCS | Laboratory Control Sample |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| DUP | Sample Duplicate |
| %Rec | Percent Recovery |
| RPD | Relative Percent Difference |
| LOD | DoD Limit of Detection |
| LOQ | DoD Limit of Quantitation |
| DL | DoD Detection Limit |
| I | Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL) |
| (S) | Surrogate Compound |
| NC | Not Calculated |
| * | Result outside of QC limits |

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620001**
Sample ID: **FFMP005W**

Date Collected: 5/20/2020 10:17 Matrix: Ground Water
Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|-------------|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Acrylonitrile | ND | 4 | ug/L | 5.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Bromochloromethane | ND | 6 | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| 1,2-Dibromo-3-chloropropane | ND | 9 | ug/L | 7.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| trans-1,4-Dichloro-2-butene | ND | 8 | ug/L | 3.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | 7 | ug/L | 5.0 | SW846 8260B | | 5/22/20 14:39 | DPC | J |

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620001**

Date Collected: 5/20/2020 10:17

Matrix: Ground Water

Sample ID: **FFMP005W**

Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|----------------|-------------|--------------|---------------|---------------|-----------------|-----------|-----------------|-----------|-------------|
| Methylene Chloride | ND | 5 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| Trichlorofluoromethane | ND | 3 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| <i>Surrogate Recoveries</i> | <i>Results</i> | <i>Flag</i> | <i>Units</i> | <i>Limits</i> | <i>Method</i> | <i>Prepared</i> | <i>By</i> | <i>Analyzed</i> | <i>By</i> | <i>Cntr</i> |
| 1,2-Dichloroethane-d4 (S) | 100 | | % | 62 - 133 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| 4-Bromofluorobenzene (S) | 106 | | % | 79 - 114 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| Dibromofluoromethane (S) | 110 | | % | 78 - 116 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |
| Toluene-d8 (S) | 101 | | % | 76 - 127 | SW846 8260B | | | 5/22/20 14:39 | DPC | J |

LIBRARY SEARCH - VOLATILES

No TIC's Detected . Lib Search VOC 5/22/20 14:39 CPK J

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 52 | | mg/L | 5 | SM2320B-2011 | | | 5/24/20 05:05 | R2B | B |
| Alkalinity, Total | 52 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/24/20 05:05 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/29/20 04:23 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/30/20 03:20 | JAM | C |
| Chloride | 209 | | mg/L | 5.0 | EPA 300.0 | | | 5/27/20 08:23 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/21/20 11:34 | MBW | B |
| Nitrate-N | 2.1 | | mg/L | 0.20 | EPA 300.0 | | | 5/21/20 11:34 | MBW | B |
| pH | 6.02 | 2 | pH_Units | | S4500HB-11 | | | 5/24/20 05:05 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/21/20 15:00 | VXF | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 904 | | umhos/cm | 1 | SM2510B-2011 | | | 5/24/20 05:05 | R2B | B |
| Sulfate | 81.2 | | mg/L | 2.0 | EPA 300.0 | | | 5/21/20 11:34 | MBW | B |
| Total Dissolved Solids | 556 | | mg/L | 25 | S2540C-11 | | | 5/22/20 13:05 | KXH | B |
| Total Organic Carbon (TOC) | 1.5 | | mg/L | 0.50 | SM5310B-2011 | | | 6/3/20 01:15 | PAG | G |
| Turbidity | 0.18 | | NTU | 0.10 | SM2130B-2011 | | | 5/21/20 09:49 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620001**

Date Collected: 5/20/2020 10:17

Matrix: Ground Water

Sample ID: **FFMP005W**

Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| Barium, Total | 0.051 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Barium, Dissolved | 0.052 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| Calcium, Total | 74.7 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Calcium, Dissolved | 75.5 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| Iron, Total | ND | | mg/L | 0.056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| Magnesium, Total | 20.0 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Magnesium, Dissolved | 20.6 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| Manganese, Total | 0.11 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Manganese, Dissolved | 0.11 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/22/20 11:40 | AHI | 5/23/20 13:30 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 14:19 | AHI | D |
| Nickel, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Potassium, Total | 3.3 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Potassium, Dissolved | 3.3 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| Sodium, Total | 54.4 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Sodium, Dissolved | 54.8 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |
| Zinc, Total | 0.0077 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:50 | MSA | E |

ALS Environmental Laboratory Locations Across North America

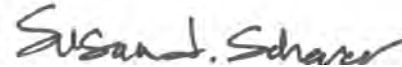
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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620001** Date Collected: 5/20/2020 10:17 Matrix: Ground Water
 Sample ID: **FFMP005W** Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:26 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 59.14 | | Feet | | Field | | | 5/20/20 10:17 | BGS | F |
| Elev Top MW Casing above MSL | 537.40 | | Feet | | Field | | | 5/20/20 10:17 | BGS | F |
| Flow Rate | 2.36 | | gal/min | | Field | | | 5/20/20 10:17 | BGS | F |
| Ground Water Elevation | 478.26 | | ft/MSL | | Field | | | 5/20/20 10:17 | BGS | F |
| pH, Field (SM4500B) | 5.38 | | pH_Units | | Field | | | 5/20/20 10:17 | BGS | F |
| Sample Depth | 135.00 | | Feet | | Field | | | 5/20/20 10:17 | BGS | F |
| Specific Conductance, Field | 965 | | umhos/cm | 1 | Field | | | 5/20/20 10:17 | BGS | F |
| Temperature | 10.13 | | Deg. C | | Field | | | 5/20/20 10:17 | BGS | F |
| Total Well Depth | 149.70 | | Feet | | Field | | | 5/20/20 10:17 | BGS | F |
| Volume in Water Column | 133.12 | | Gallons | | Field | | | 5/20/20 10:17 | BGS | F |
| Water Level After Purge | 87.72 | | Feet | | Field | | | 5/20/20 10:17 | BGS | F |
| Well Volumes Purged | 1.24 | | Vol | | Field | | | 5/20/20 10:17 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620002**

Date Collected: 5/20/2020 11:49

Matrix: Ground Water

Sample ID: **FFMP26RW**

Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Acrylonitrile | ND | 4 | ug/L | 5.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Bromochloromethane | ND | 6 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 1,2-Dibromo-3-chloropropane | ND | 9 | ug/L | 7.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| trans-1,4-Dichloro-2-butene | ND | 8 | ug/L | 3.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | 7 | ug/L | 5.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3103620002**

Date Collected: 5/20/2020 11:49

Matrix: Ground Water

 Sample ID: **FFMP26RW**

Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|----------------|-------------|--------------|---------------|---------------|-----------------|-----------|-----------------|-----------|-------------|
| Methylene Chloride | ND | 5 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Trichlorofluoromethane | ND | 3 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| <i>Surrogate Recoveries</i> | <i>Results</i> | <i>Flag</i> | <i>Units</i> | <i>Limits</i> | <i>Method</i> | <i>Prepared</i> | <i>By</i> | <i>Analyzed</i> | <i>By</i> | <i>Cntr</i> |
| 1,2-Dichloroethane-d4 (S) | 103 | | % | 62 - 133 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| 4-Bromofluorobenzene (S) | 109 | | % | 79 - 114 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Dibromofluoromethane (S) | 112 | | % | 78 - 116 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |
| Toluene-d8 (S) | 102 | | % | 76 - 127 | SW846 8260B | | | 5/22/20 15:01 | DPC | J |

LIBRARY SEARCH - VOLATILES

No TIC's Detected . Lib Search VOC 5/22/20 15:01 CPK J

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 54 | | mg/L | 5 | SM2320B-2011 | | | 5/24/20 05:05 | R2B | B |
| Alkalinity, Total | 54 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/24/20 05:05 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/28/20 02:58 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/30/20 03:20 | JAM | C |
| Chloride | 164 | | mg/L | 2.0 | EPA 300.0 | | | 5/21/20 11:57 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/21/20 11:57 | MBW | B |
| Nitrate-N | 1.2 | | mg/L | 0.20 | EPA 300.0 | | | 5/21/20 11:57 | MBW | B |
| pH | 5.87 | 2 | pH_Units | | S4500HB-11 | | | 5/24/20 05:05 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/21/20 15:00 | VXF | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 817 | | umhos/cm | 1 | SM2510B-2011 | | | 5/24/20 05:05 | R2B | B |
| Sulfate | 103 | | mg/L | 2.0 | EPA 300.0 | | | 5/21/20 11:57 | MBW | B |
| Total Dissolved Solids | 438 | | mg/L | 25 | S2540C-11 | | | 5/22/20 13:05 | KXH | B |
| Total Organic Carbon (TOC) | 1.9 | | mg/L | 0.50 | SM5310B-2011 | | | 6/3/20 01:15 | PAG | G |
| Turbidity | 0.45 | | NTU | 0.10 | SM2130B-2011 | | | 5/21/20 09:49 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

| | | |
|----------------------------|---------------------------------|----------------------|
| Lab ID: 3103620002 | Date Collected: 5/20/2020 11:49 | Matrix: Ground Water |
| Sample ID: FFMP26RW | Date Received: 5/20/2020 15:54 | |

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| Barium, Total | 0.090 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Barium, Dissolved | 0.090 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| Calcium, Total | 64.4 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Calcium, Dissolved | 65.6 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| Cobalt, Total | 0.027 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| Iron, Total | ND | | mg/L | 0.056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| Magnesium, Total | 15.8 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Magnesium, Dissolved | 16.9 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| Manganese, Total | 0.73 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Manganese, Dissolved | 0.75 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/22/20 11:40 | AHI | 5/23/20 13:31 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 14:22 | AHI | D |
| Nickel, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Potassium, Total | 8.4 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Potassium, Dissolved | 8.9 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| Sodium, Total | 54.9 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Sodium, Dissolved | 55.3 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |
| Zinc, Total | 0.011 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:53 | MSA | E |

ALS Environmental Laboratory Locations Across North America

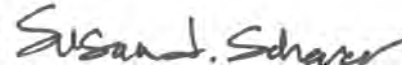
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 Vancouver Waterloo · Winnipeg · Yellowknife
 United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York
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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620002** Date Collected: 5/20/2020 11:49 Matrix: Ground Water
 Sample ID: **FFMP26RW** Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | 0.011 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:23 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 70.45 | | Feet | | Field | | | 5/20/20 11:49 | BGS | F |
| Elev Top MW Casing above MSL | 547.40 | | Feet | | Field | | | 5/20/20 11:49 | BGS | F |
| Flow Rate | 2.09 | | gal/min | | Field | | | 5/20/20 11:49 | BGS | F |
| Ground Water Elevation | 476.95 | | ft/MSL | | Field | | | 5/20/20 11:49 | BGS | F |
| pH, Field (SM4500B) | 5.47 | | pH_Units | | Field | | | 5/20/20 11:49 | BGS | F |
| Sample Depth | 105.00 | | Feet | | Field | | | 5/20/20 11:49 | BGS | F |
| Specific Conductance, Field | 862 | | umhos/cm | 1 | Field | | | 5/20/20 11:49 | BGS | F |
| Temperature | 11.44 | | Deg. C | | Field | | | 5/20/20 11:49 | BGS | F |
| Total Well Depth | 118.30 | | Feet | | Field | | | 5/20/20 11:49 | BGS | F |
| Volume in Water Column | 70.34 | | Gallons | | Field | | | 5/20/20 11:49 | BGS | F |
| Water Level After Purge | 80.04 | | Feet | | Field | | | 5/20/20 11:49 | BGS | F |
| Well Volumes Purged | 1.78 | | Vol | | Field | | | 5/20/20 11:49 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3103620003** Date Collected: 5/20/2020 13:03 Matrix: Ground Water
 Sample ID: **FFMP03AW** Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Acrylonitrile | ND | 6 | ug/L | 5.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Bromochloromethane | ND | 8 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 1,2-Dibromo-3-chloropropane | ND | 4 | ug/L | 7.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| trans-1,4-Dichloro-2-butene | ND | 3 | ug/L | 3.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | 9 | ug/L | 5.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620003** Date Collected: 5/20/2020 13:03 Matrix: Ground Water
Sample ID: **FFMP03AW** Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|-----|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | 7 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Trichlorofluoromethane | ND | 5 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |

| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| 1,2-Dichloroethane-d4 (S) | 99.1 | | % | 62 - 133 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| 4-Bromofluorobenzene (S) | 108 | | % | 79 - 114 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Dibromofluoromethane (S) | 110 | | % | 78 - 116 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |
| Toluene-d8 (S) | 101 | | % | 76 - 127 | SW846 8260B | | | 5/22/20 15:24 | DPC | J |

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WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|------|----|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 17 | | mg/L | 5 | SM2320B-2011 | | | 5/24/20 05:05 | R2B | B |
| Alkalinity, Total | 17 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/24/20 05:05 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/30/20 20:46 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/28/20 03:10 | JAM | C |
| Chloride | 28.7 | | mg/L | 2.0 | EPA 300.0 | | | 5/21/20 12:20 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/21/20 12:20 | MBW | B |
| Nitrate-N | 22.0 | 10 | mg/L | 0.50 | EPA 300.0 | | | 5/27/20 10:05 | MBW | B |
| pH | 5.49 | 2 | pH_Units | | S4500HB-11 | | | 5/24/20 05:05 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/21/20 15:00 | VXF | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 294 | | umhos/cm | 1 | SM2510B-2011 | | | 5/24/20 05:05 | R2B | B |
| Sulfate | 3.4 | | mg/L | 2.0 | EPA 300.0 | | | 5/21/20 12:20 | MBW | B |
| Total Dissolved Solids | 184 | | mg/L | 25 | S2540C-11 | | | 5/22/20 13:05 | KXH | B |
| Total Organic Carbon (TOC) | ND | | mg/L | 0.50 | SM5310B-2011 | | | 6/3/20 01:15 | PAG | G |
| Turbidity | ND | | NTU | 0.10 | SM2130B-2011 | | | 5/21/20 09:49 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620003**

Date Collected: 5/20/2020 13:03

Matrix: Ground Water

Sample ID: **FFMP03AW**

Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| Barium, Total | 0.045 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Barium, Dissolved | 0.045 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| Calcium, Total | 17.7 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Calcium, Dissolved | 17.4 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Copper, Total | 0.0065 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Copper, Dissolved | 0.0063 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| Iron, Total | ND | | mg/L | 0.056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| Magnesium, Total | 12.7 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Magnesium, Dissolved | 13.3 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| Manganese, Total | 0.29 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Manganese, Dissolved | 0.28 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/22/20 11:40 | AHI | 5/23/20 13:34 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 14:23 | AHI | D |
| Nickel, Total | 0.0095 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Potassium, Total | 1.3 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Potassium, Dissolved | 1.3 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| Sodium, Total | 11.8 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Sodium, Dissolved | 12.1 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |
| Zinc, Total | 0.017 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 04:56 | MSA | E |

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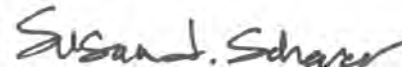
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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620003** Date Collected: 5/20/2020 13:03 Matrix: Ground Water
 Sample ID: **FFMP03AW** Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | 0.017 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:29 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 50.18 | | Feet | | Field | | | 5/20/20 13:03 | BGS | F |
| Elev Top MW Casing above MSL | 590.90 | | Feet | | Field | | | 5/20/20 13:03 | BGS | F |
| Flow Rate | 1.96 | | gal/min | | Field | | | 5/20/20 13:03 | BGS | F |
| Ground Water Elevation | 540.72 | | ft/MSL | | Field | | | 5/20/20 13:03 | BGS | F |
| pH, Field (SM4500B) | 5.03 | | pH_Units | | Field | | | 5/20/20 13:03 | BGS | F |
| Sample Depth | 130.00 | | Feet | | Field | | | 5/20/20 13:03 | BGS | F |
| Specific Conductance, Field | 320 | | umhos/cm | 1 | Field | | | 5/20/20 13:03 | BGS | F |
| Temperature | 10.51 | | Deg. C | | Field | | | 5/20/20 13:03 | BGS | F |
| Total Well Depth | 148.40 | | Feet | | Field | | | 5/20/20 13:03 | BGS | F |
| Volume in Water Column | 144.38 | | Gallons | | Field | | | 5/20/20 13:03 | BGS | F |
| Water Level After Purge | 84.60 | | Feet | | Field | | | 5/20/20 13:03 | BGS | F |
| Well Volumes Purged | 0.81 | | Vol | | Field | | | 5/20/20 13:03 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620004**

Date Collected: 5/20/2020 13:52

Matrix: Ground Water

Sample ID: **FFMP018W**

Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Acrylonitrile | ND | 4 | ug/L | 5.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Bromochloromethane | ND | 6 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 1,2-Dibromo-3-chloropropane | ND | 9 | ug/L | 7.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| trans-1,4-Dichloro-2-butene | ND | 8 | ug/L | 3.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | 7 | ug/L | 5.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3103620004**

Date Collected: 5/20/2020 13:52

Matrix: Ground Water

 Sample ID: **FFMP018W**

Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|----------------|-------------|--------------|---------------|---------------|-----------------|-----------|-----------------|-----------|-------------|
| Methylene Chloride | ND | 5 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Trichlorofluoromethane | ND | 3 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| <i>Surrogate Recoveries</i> | <i>Results</i> | <i>Flag</i> | <i>Units</i> | <i>Limits</i> | <i>Method</i> | <i>Prepared</i> | <i>By</i> | <i>Analyzed</i> | <i>By</i> | <i>Cntr</i> |
| 1,2-Dichloroethane-d4 (S) | 98.9 | | % | 62 - 133 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| 4-Bromofluorobenzene (S) | 106 | | % | 79 - 114 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Dibromofluoromethane (S) | 110 | | % | 78 - 116 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |
| Toluene-d8 (S) | 99.7 | | % | 76 - 127 | SW846 8260B | | | 5/22/20 15:47 | DPC | J |

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WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 25 | | mg/L | 5 | SM2320B-2011 | | | 5/24/20 05:05 | R2B | B |
| Alkalinity, Total | 25 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/24/20 05:05 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/28/20 04:48 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/28/20 03:10 | JAM | C |
| Chloride | 99.3 | | mg/L | 2.0 | EPA 300.0 | | | 5/21/20 12:43 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/21/20 12:43 | MBW | B |
| Nitrate-N | 4.8 | | mg/L | 0.20 | EPA 300.0 | | | 5/21/20 12:43 | MBW | B |
| pH | 6.09 | 2 | pH_Units | | S4500HB-11 | | | 5/24/20 05:05 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/21/20 15:00 | VXF | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 497 | | umhos/cm | 1 | SM2510B-2011 | | | 5/24/20 05:05 | R2B | B |
| Sulfate | 40.8 | | mg/L | 2.0 | EPA 300.0 | | | 5/21/20 12:43 | MBW | B |
| Total Dissolved Solids | 296 | | mg/L | 25 | S2540C-11 | | | 5/22/20 13:05 | KXH | B |
| Total Organic Carbon (TOC) | ND | | mg/L | 0.50 | SM5310B-2011 | | | 6/3/20 01:15 | PAG | G |
| Turbidity | 0.23 | | NTU | 0.10 | SM2130B-2011 | | | 5/21/20 09:49 | R2B | B |

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 Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620004**

Date Collected: 5/20/2020 13:52

Matrix: Ground Water

Sample ID: **FFMP018W**

Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| Barium, Total | 0.066 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Barium, Dissolved | 0.065 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| Calcium, Total | 29.2 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Calcium, Dissolved | 29.7 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| Cobalt, Total | 0.0066 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| Iron, Total | 0.067 | | mg/L | 0.056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| Magnesium, Total | 14.5 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Magnesium, Dissolved | 15.3 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| Manganese, Total | 0.21 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Manganese, Dissolved | 0.23 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/22/20 11:40 | AHI | 5/23/20 13:36 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 14:25 | AHI | D |
| Nickel, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Potassium, Total | 4.5 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Potassium, Dissolved | 4.7 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| Sodium, Total | 31.1 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Sodium, Dissolved | 33.2 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |
| Zinc, Total | 0.015 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:00 | MSA | E |

ALS Environmental Laboratory Locations Across North America

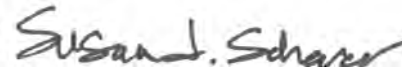
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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620004** Date Collected: 5/20/2020 13:52 Matrix: Ground Water
 Sample ID: **FFMP018W** Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | 0.014 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 13:33 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 25.63 | | Feet | | Field | | | 5/20/20 13:52 | BGS | F |
| Elev Top MW Casing above MSL | 472.20 | | Feet | | Field | | | 5/20/20 13:52 | BGS | F |
| Flow Rate | 4.64 | | gal/min | | Field | | | 5/20/20 13:52 | BGS | F |
| Ground Water Elevation | 446.57 | | ft/MSL | | Field | | | 5/20/20 13:52 | BGS | F |
| pH, Field (SM4500B) | 5.34 | | pH_Units | | Field | | | 5/20/20 13:52 | BGS | F |
| Sample Depth | 40.00 | | Feet | | Field | | | 5/20/20 13:52 | BGS | F |
| Specific Conductance, Field | 528 | | umhos/cm | 1 | Field | | | 5/20/20 13:52 | BGS | F |
| Temperature | 11.91 | | Deg. C | | Field | | | 5/20/20 13:52 | BGS | F |
| Total Well Depth | 51.46 | | Feet | | Field | | | 5/20/20 13:52 | BGS | F |
| Volume in Water Column | 16.79 | | Gallons | | Field | | | 5/20/20 13:52 | BGS | F |
| Water Level After Purge | 28.50 | | Feet | | Field | | | 5/20/20 13:52 | BGS | F |
| Well Volumes Purged | 3.87 | | Vol | | Field | | | 5/20/20 13:52 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620005**

Date Collected: 5/20/2020 14:36

Matrix: Ground Water

Sample ID: **FFMP019W**

Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Acrylonitrile | ND | 4 | ug/L | 5.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Bromochloromethane | ND | 6 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 1,2-Dibromo-3-chloropropane | ND | 9 | ug/L | 7.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| trans-1,4-Dichloro-2-butene | ND | 8 | ug/L | 3.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | 7 | ug/L | 5.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620005** Date Collected: 5/20/2020 14:36 Matrix: Ground Water
Sample ID: **FFMP019W** Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | 5 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Trichlorofluoromethane | ND | 3 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 102 | | % | 62 - 133 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| 4-Bromofluorobenzene (S) | 110 | | % | 79 - 114 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Dibromofluoromethane (S) | 114 | | % | 78 - 116 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |
| Toluene-d8 (S) | 101 | | % | 76 - 127 | SW846 8260B | | | 5/22/20 16:09 | DPC | J |

LIBRARY SEARCH - VOLATILES

No TIC's Detected . Lib Search VOC 5/22/20 16:09 CPK J

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 63 | | mg/L | 5 | SM2320B-2011 | | | 5/24/20 05:05 | R2B | B |
| Alkalinity, Total | 63 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/24/20 05:05 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/29/20 04:37 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/29/20 00:58 | JAM | C |
| Chloride | 86.9 | | mg/L | 2.0 | EPA 300.0 | | | 5/21/20 13:06 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/21/20 13:06 | MBW | B |
| Nitrate-N | 0.26 | | mg/L | 0.20 | EPA 300.0 | | | 5/21/20 13:06 | MBW | B |
| pH | 7.30 | 2 | pH_Units | | S4500HB-11 | | | 5/24/20 05:05 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/21/20 15:00 | VXF | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 428 | | umhos/cm | 1 | SM2510B-2011 | | | 5/24/20 05:05 | R2B | B |
| Sulfate | 15.8 | | mg/L | 2.0 | EPA 300.0 | | | 5/21/20 13:06 | MBW | B |
| Total Dissolved Solids | 392 | | mg/L | 25 | S2540C-11 | | | 5/22/20 13:05 | KXH | B |
| Total Organic Carbon (TOC) | 0.65 | | mg/L | 0.50 | SM5310B-2011 | | | 6/3/20 01:15 | PAG | G |
| Turbidity | 0.11 | | NTU | 0.10 | SM2130B-2011 | | | 5/21/20 09:49 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3103620005**

Date Collected: 5/20/2020 14:36

Matrix: Ground Water

 Sample ID: **FFMP019W**

Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| Barium, Total | 0.080 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Barium, Dissolved | 0.078 | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| Calcium, Total | 55.4 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Calcium, Dissolved | 54.8 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| Iron, Total | ND | | mg/L | 0.056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| Lead, Total | 0.0023 | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| Magnesium, Total | 5.6 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Magnesium, Dissolved | 5.6 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| Manganese, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Manganese, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/22/20 11:40 | AHI | 5/23/20 13:37 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/27/20 10:37 | AHI | 5/27/20 14:26 | AHI | D |
| Nickel, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Potassium, Total | 0.84 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Potassium, Dissolved | 0.84 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| Sodium, Total | 9.9 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Sodium, Dissolved | 10.0 | | mg/L | 0.11 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |
| Zinc, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:03 | MSA | E |

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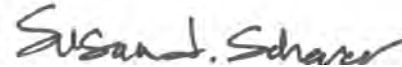
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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103620005** Date Collected: 5/20/2020 14:36 Matrix: Ground Water
 Sample ID: **FFMP019W** Date Received: 5/20/2020 15:54

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/26/20 21:15 | SXC | 5/28/20 01:08 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 26.50 | | Feet | | Field | | | 5/20/20 14:36 | BGS | F |
| Elev Top MW Casing above MSL | 471.95 | | Feet | | Field | | | 5/20/20 14:36 | BGS | F |
| Flow Rate | 4.12 | | gal/min | | Field | | | 5/20/20 14:36 | BGS | F |
| Ground Water Elevation | 445.45 | | ft/MSL | | Field | | | 5/20/20 14:36 | BGS | F |
| pH, Field (SM4500B) | 6.53 | | pH_Units | | Field | | | 5/20/20 14:36 | BGS | F |
| Sample Depth | 49.00 | | Feet | | Field | | | 5/20/20 14:36 | BGS | F |
| Specific Conductance, Field | 463 | | umhos/cm | 1 | Field | | | 5/20/20 14:36 | BGS | F |
| Temperature | 10.71 | | Deg. C | | Field | | | 5/20/20 14:36 | BGS | F |
| Total Well Depth | 132.79 | | Feet | | Field | | | 5/20/20 14:36 | BGS | F |
| Volume in Water Column | 69.09 | | Gallons | | Field | | | 5/20/20 14:36 | BGS | F |
| Water Level After Purge | 33.97 | | Feet | | Field | | | 5/20/20 14:36 | BGS | F |
| Well Volumes Purged | 2.38 | | Vol | | Field | | | 5/20/20 14:36 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

PARAMETER QUALIFIERS

| Lab ID | # | Sample ID | Analytical Method | Analyte |
|---|---|-----------|-------------------|-----------------------------|
| 3103620001 | 1 | FFMP005W | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L. | | | | |
| 3103620001 | 2 | FFMP005W | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3103620001 | 3 | FFMP005W | SW846 8260B | Trichlorofluoromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Trichlorofluoromethane. The % Recovery was reported as 132 and the control limits were 38 to 123. | | | | |
| 3103620001 | 4 | FFMP005W | SW846 8260B | Acrylonitrile |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Acrylonitrile. The % Recovery was reported as 70.2 and the control limits were 71 to 151. | | | | |
| 3103620001 | 5 | FFMP005W | SW846 8260B | Methylene Chloride |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Methylene Chloride. The % Recovery was reported as 122 and the control limits were 76 to 121. | | | | |
| 3103620001 | 6 | FFMP005W | SW846 8260B | Bromochloromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Bromochloromethane. The % Recovery was reported as 131 and the control limits were 73 to 117. | | | | |
| 3103620001 | 7 | FFMP005W | SW846 8260B | 4-Methyl-2-Pentanone(MIBK) |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte 4-Methyl-2-Pentanone(MIBK). The % Recovery was reported as 69.8 and the control limits were 71 to 146. | | | | |
| 3103620001 | 8 | FFMP005W | SW846 8260B | trans-1,4-Dichloro-2-butene |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,4-Dichloro-2-butene. The % Recovery was reported as 59.3 and the control limits were 60 to 141. | | | | |
| 3103620001 | 9 | FFMP005W | SW846 8260B | 1,2-Dibromo-3-chloropropane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte 1,2-Dibromo-3-chloropropane. The % Recovery was reported as 47.9 and the control limits were 59 to 133. | | | | |
| 3103620002 | 1 | FFMP26RW | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L. | | | | |
| 3103620002 | 2 | FFMP26RW | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3103620002 | 3 | FFMP26RW | SW846 8260B | Trichlorofluoromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Trichlorofluoromethane. The % Recovery was reported as 132 and the control limits were 38 to 123. | | | | |
| 3103620002 | 4 | FFMP26RW | SW846 8260B | Acrylonitrile |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Acrylonitrile. The % Recovery was reported as 70.2 and the control limits were 71 to 151. | | | | |
| 3103620002 | 5 | FFMP26RW | SW846 8260B | Methylene Chloride |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Methylene Chloride. The % Recovery was reported as 122 and the control limits were 76 to 121. | | | | |
| 3103620002 | 6 | FFMP26RW | SW846 8260B | Bromochloromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Bromochloromethane. The % Recovery was reported as 131 and the control limits were 73 to 117. | | | | |

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

| | | | | |
|---|----|----------|--------------|-----------------------------|
| 3103620002 | 7 | FFMP26RW | SW846 8260B | 4-Methyl-2-Pentanone(MIBK) |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte 4-Methyl-2-Pentanone(MIBK). The % Recovery was reported as 69.8 and the control limits were 71 to 146. | | | | |
| 3103620002 | 8 | FFMP26RW | SW846 8260B | trans-1,4-Dichloro-2-butene |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,4-Dichloro-2-butene. The % Recovery was reported as 59.3 and the control limits were 60 to 141. | | | | |
| 3103620002 | 9 | FFMP26RW | SW846 8260B | 1,2-Dibromo-3-chloropropane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte 1,2-Dibromo-3-chloropropane. The % Recovery was reported as 47.9 and the control limits were 59 to 133. | | | | |
| 3103620003 | 1 | FFMP03AW | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L. | | | | |
| 3103620003 | 2 | FFMP03AW | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3103620003 | 3 | FFMP03AW | SW846 8260B | trans-1,4-Dichloro-2-butene |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,4-Dichloro-2-butene. The % Recovery was reported as 59.3 and the control limits were 60 to 141. | | | | |
| 3103620003 | 4 | FFMP03AW | SW846 8260B | 1,2-Dibromo-3-chloropropane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte 1,2-Dibromo-3-chloropropane. The % Recovery was reported as 47.9 and the control limits were 59 to 133. | | | | |
| 3103620003 | 5 | FFMP03AW | SW846 8260B | Trichlorofluoromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Trichlorofluoromethane. The % Recovery was reported as 132 and the control limits were 38 to 123. | | | | |
| 3103620003 | 6 | FFMP03AW | SW846 8260B | Acrylonitrile |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Acrylonitrile. The % Recovery was reported as 70.2 and the control limits were 71 to 151. | | | | |
| 3103620003 | 7 | FFMP03AW | SW846 8260B | Methylene Chloride |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Methylene Chloride. The % Recovery was reported as 122 and the control limits were 76 to 121. | | | | |
| 3103620003 | 8 | FFMP03AW | SW846 8260B | Bromochloromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Bromochloromethane. The % Recovery was reported as 131 and the control limits were 73 to 117. | | | | |
| 3103620003 | 9 | FFMP03AW | SW846 8260B | 4-Methyl-2-Pentanone(MIBK) |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte 4-Methyl-2-Pentanone(MIBK). The % Recovery was reported as 69.8 and the control limits were 71 to 146. | | | | |
| 3103620003 | 10 | FFMP03AW | EPA 300.0 | Nitrate-N |
| The sample was originally run within hold time, but required further analysis that exceeded hold time. | | | | |
| 3103620004 | 1 | FFMP018W | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L. | | | | |
| 3103620004 | 2 | FFMP018W | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3103620004 | 3 | FFMP018W | SW846 8260B | Trichlorofluoromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Trichlorofluoromethane. The % Recovery was reported as 132 and the control limits were 38 to 123. | | | | |

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ANALYTICAL RESULTS

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

| | | | | |
|---|---|----------|--------------|-----------------------------|
| 3103620004 | 4 | FFMP018W | SW846 8260B | Acrylonitrile |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Acrylonitrile. The % Recovery was reported as 70.2 and the control limits were 71 to 151. | | | | |
| 3103620004 | 5 | FFMP018W | SW846 8260B | Methylene Chloride |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Methylene Chloride. The % Recovery was reported as 122 and the control limits were 76 to 121. | | | | |
| 3103620004 | 6 | FFMP018W | SW846 8260B | Bromochloromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Bromochloromethane. The % Recovery was reported as 131 and the control limits were 73 to 117. | | | | |
| 3103620004 | 7 | FFMP018W | SW846 8260B | 4-Methyl-2-Pentanone(MIBK) |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte 4-Methyl-2-Pentanone(MIBK). The % Recovery was reported as 69.8 and the control limits were 71 to 146. | | | | |
| 3103620004 | 8 | FFMP018W | SW846 8260B | trans-1,4-Dichloro-2-butene |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,4-Dichloro-2-butene. The % Recovery was reported as 59.3 and the control limits were 60 to 141. | | | | |
| 3103620004 | 9 | FFMP018W | SW846 8260B | 1,2-Dibromo-3-chloropropane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte 1,2-Dibromo-3-chloropropane. The % Recovery was reported as 47.9 and the control limits were 59 to 133. | | | | |
| 3103620005 | 1 | FFMP019W | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L. | | | | |
| 3103620005 | 2 | FFMP019W | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3103620005 | 3 | FFMP019W | SW846 8260B | Trichlorofluoromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Trichlorofluoromethane. The % Recovery was reported as 132 and the control limits were 38 to 123. | | | | |
| 3103620005 | 4 | FFMP019W | SW846 8260B | Acrylonitrile |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Acrylonitrile. The % Recovery was reported as 70.2 and the control limits were 71 to 151. | | | | |
| 3103620005 | 5 | FFMP019W | SW846 8260B | Methylene Chloride |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Methylene Chloride. The % Recovery was reported as 122 and the control limits were 76 to 121. | | | | |
| 3103620005 | 6 | FFMP019W | SW846 8260B | Bromochloromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Bromochloromethane. The % Recovery was reported as 131 and the control limits were 73 to 117. | | | | |
| 3103620005 | 7 | FFMP019W | SW846 8260B | 4-Methyl-2-Pentanone(MIBK) |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte 4-Methyl-2-Pentanone(MIBK). The % Recovery was reported as 69.8 and the control limits were 71 to 146. | | | | |
| 3103620005 | 8 | FFMP019W | SW846 8260B | trans-1,4-Dichloro-2-butene |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,4-Dichloro-2-butene. The % Recovery was reported as 59.3 and the control limits were 60 to 141. | | | | |
| 3103620005 | 9 | FFMP019W | SW846 8260B | 1,2-Dibromo-3-chloropropane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte 1,2-Dibromo-3-chloropropane. The % Recovery was reported as 47.9 and the control limits were 59 to 133. | | | | |

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

| Lab ID | Sample ID | Analysis Method | Prep Method | Leachate Method |
|------------|-----------|-----------------|-------------|-----------------|
| 3103620001 | FFMP005W | ASTM D6919-09 | | |
| 3103620001 | FFMP005W | EPA 300.0 | | |
| 3103620001 | FFMP005W | EPA 410.4 | | |
| 3103620001 | FFMP005W | Field | | |
| 3103620001 | FFMP005W | Lib Search VOC | | |
| 3103620001 | FFMP005W | S2540C-11 | | |
| 3103620001 | FFMP005W | S4500HB-11 | | |
| 3103620001 | FFMP005W | SM2130B-2011 | | |
| 3103620001 | FFMP005W | SM2320B-2011 | | |
| 3103620001 | FFMP005W | SM2510B-2011 | | |
| 3103620001 | FFMP005W | SM5310B-2011 | | |
| 3103620001 | FFMP005W | SW846 6020A | SW846 3015 | |
| 3103620001 | FFMP005W | SW846 7470A | SW846 7470A | |
| 3103620001 | FFMP005W | SW846 8260B | | |
| 3103620001 | FFMP005W | SW846 9066 | 420.4/9066 | |
| 3103620002 | FFMP26RW | ASTM D6919-09 | | |
| 3103620002 | FFMP26RW | EPA 300.0 | | |
| 3103620002 | FFMP26RW | EPA 410.4 | | |
| 3103620002 | FFMP26RW | Field | | |
| 3103620002 | FFMP26RW | Lib Search VOC | | |
| 3103620002 | FFMP26RW | S2540C-11 | | |
| 3103620002 | FFMP26RW | S4500HB-11 | | |
| 3103620002 | FFMP26RW | SM2130B-2011 | | |
| 3103620002 | FFMP26RW | SM2320B-2011 | | |
| 3103620002 | FFMP26RW | SM2510B-2011 | | |
| 3103620002 | FFMP26RW | SM5310B-2011 | | |
| 3103620002 | FFMP26RW | SW846 6020A | SW846 3015 | |
| 3103620002 | FFMP26RW | SW846 7470A | SW846 7470A | |
| 3103620002 | FFMP26RW | SW846 8260B | | |
| 3103620002 | FFMP26RW | SW846 9066 | 420.4/9066 | |
| 3103620003 | FFMP03AW | ASTM D6919-09 | | |
| 3103620003 | FFMP03AW | EPA 300.0 | | |
| 3103620003 | FFMP03AW | EPA 410.4 | | |
| 3103620003 | FFMP03AW | Field | | |
| 3103620003 | FFMP03AW | Lib Search VOC | | |
| 3103620003 | FFMP03AW | S2540C-11 | | |
| 3103620003 | FFMP03AW | S4500HB-11 | | |
| 3103620003 | FFMP03AW | SM2130B-2011 | | |
| 3103620003 | FFMP03AW | SM2320B-2011 | | |
| 3103620003 | FFMP03AW | SM2510B-2011 | | |
| 3103620003 | FFMP03AW | SM5310B-2011 | | |
| 3103620003 | FFMP03AW | SW846 6020A | SW846 3015 | |
| 3103620003 | FFMP03AW | SW846 7470A | SW846 7470A | |
| 3103620003 | FFMP03AW | SW846 8260B | | |
| 3103620003 | FFMP03AW | SW846 9066 | 420.4/9066 | |
| 3103620004 | FFMP018W | ASTM D6919-09 | | |

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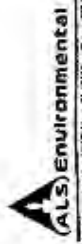
ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3103620 2ND QTR 2020 FFMP-FORM 19A

| Lab ID | Sample ID | Analysis Method | Prep Method | Leachate Method |
|------------|-----------|-----------------|-------------|-----------------|
| 3103620004 | FFMP018W | EPA 300.0 | | |
| 3103620004 | FFMP018W | EPA 410.4 | | |
| 3103620004 | FFMP018W | Field | | |
| 3103620004 | FFMP018W | Lib Search VOC | | |
| 3103620004 | FFMP018W | S2540C-11 | | |
| 3103620004 | FFMP018W | S4500HB-11 | | |
| 3103620004 | FFMP018W | SM2130B-2011 | | |
| 3103620004 | FFMP018W | SM2320B-2011 | | |
| 3103620004 | FFMP018W | SM2510B-2011 | | |
| 3103620004 | FFMP018W | SM5310B-2011 | | |
| 3103620004 | FFMP018W | SW846 6020A | SW846 3015 | |
| 3103620004 | FFMP018W | SW846 7470A | SW846 7470A | |
| 3103620004 | FFMP018W | SW846 8260B | | |
| 3103620004 | FFMP018W | SW846 9066 | 420.4/9066 | |
| 3103620005 | FFMP019W | ASTM D6919-09 | | |
| 3103620005 | FFMP019W | EPA 300.0 | | |
| 3103620005 | FFMP019W | EPA 410.4 | | |
| 3103620005 | FFMP019W | Field | | |
| 3103620005 | FFMP019W | Lib Search VOC | | |
| 3103620005 | FFMP019W | S2540C-11 | | |
| 3103620005 | FFMP019W | S4500HB-11 | | |
| 3103620005 | FFMP019W | SM2130B-2011 | | |
| 3103620005 | FFMP019W | SM2320B-2011 | | |
| 3103620005 | FFMP019W | SM2510B-2011 | | |
| 3103620005 | FFMP019W | SM5310B-2011 | | |
| 3103620005 | FFMP019W | SW846 6020A | SW846 3015 | |
| 3103620005 | FFMP019W | SW846 7470A | SW846 7470A | |
| 3103620005 | FFMP019W | SW846 8260B | | |
| 3103620005 | FFMP019W | SW846 9066 | 420.4/9066 | |

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**CHAIN OF CUSTODY/
REQUEST FOR ANALYSIS**
ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT/
SAMPLER. INSTRUCTIONS ON THE BACK.

Generated by ALS

301 Fulwing Mill Road • Middletown, PA 17057 • Fax: 717.944.5541 • Fax: 717.944.1430

Client Name: Lancaster County Solid Waste MA
Address: 1299 Harrisburg Pike, P.O. Box 4424
Lancaster, PA 17604

Contact: Dan Brown
Phone#: (717) 735-0193
Project Name#: Frey Farm Annual
Bill To: Lancaster County Solid Waste MA
TAT Normal-Standard TAT is 10-12 business days.
 Rush-Subject to ALS approval and surcharges.
Date Required: _____ Approved By: _____
Email? -Y dbrown@lcswwma.org
Fax? -Y No: (717) 397-9973

COC #:
ALS Quo



3 1 D 3 6 2 0
Cooler Temp: 0 Therm IU:
No. of Coolers: Y N Initial

Custody Seals Present?
(if present) Seals Intact?
Received on Ice?
COC Labels Complete/Accurate?
Cont. in Good Cond.?
Correct Containers?
Correct Sample Volumes?
Correct Preservation?
Headspace/Volatiles?

Courier/Tracking #:
Sample/COC Comments

| Sample Date | Time | Enter Number of Containers Per Sample or Field Results Below. | | | | | | | | | | ALS Field Services: <input type="checkbox"/> Pickup <input type="checkbox"/> Labor <input type="checkbox"/> Composite_Sampling <input type="checkbox"/> Rental_Equipment <input type="checkbox"/> Other: | | | | | |
|----------------|----------|---|---------|-----|------|-----------------------------|--------------------|---------------------------|---|---|--------------------------------------|---|------------------|---|---|----------------------------------|--|
| | | T Matrix | G OC | TOC | O-OH | VOC (Form 19A) + Subtitle D | Field Measurements | Sample Depth for AUX Data | Disolved: Fe, Mn, Na, Ba, Cr, Cu, Pb, Mg, K, Zn, As, Cd, Se, Ag, Hg, Ca | Metals: Fe, Mn, Na, Ba, Cr, Cu, Pb, Mg, K, Zn, As, Cd, Se, Ag, Hg, Ca | PH, Cl, SPC, F, SO4, TDS, NO3, Turb. | | Alkalinity, HCO3 | | | | |
| 1. FFMP005W | 05/20/20 | 1017 | G | GW | 2 | 1 | 2 | X | X | 1 | 1 | 1 | 1 | 1 | 1 | **Add Subtitle D to Total Metals | |
| 2. FFMP26RW | 05/20/20 | 1149 | G | GW | 2 | 1 | 2 | X | X | 1 | 1 | 1 | 1 | 1 | 1 | | |
| 3. FFMP03AW | 05/20/20 | 1303 | G | GW | 2 | 1 | 2 | X | X | 1 | 1 | 1 | 1 | 1 | 1 | | |
| 4. FFMP018W | 05/20/20 | 1352 | G | GW | 2 | 1 | 2 | X | X | 1 | 1 | 1 | 1 | 1 | 1 | | |
| 5. FFMP019W | 05/20/20 | 1436 | G | GW | 2 | 1 | 2 | X | X | 1 | 1 | 1 | 1 | 1 | 1 | | |
| 6 | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |

Project Comments:

LOGGED BY (signature): _____

REVIEWED BY (signature): _____

| Relinquished By / Company Name | Date | Time | Received By / Company Name | Date | Time |
|--------------------------------|---------|------|----------------------------|---------|------|
| 1. <u>XXXXXXXXXXXX ALS</u> | 5-20-20 | 1504 | <u>[Signature]</u> | 5/20/20 | 1554 |
| 3 | | | | | |
| 5 | | | | | |
| 7 | | | | | |
| 9 | | | | | |

Standard CLP-like USACE

Deliverables USACE

Special Processing: USACE Navy

State Samples Collected In: NY NJ PA NC

Reportable to PADEP? Yes No

Sample Disposal: Lab Special

PWSID # _____

EDDS: Format Type: _____

* G=Grab; C=Composite **Matrix - Air=Air; DW=Drinking Water; GW=Groundwater; Oil=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057



301 Fulling Mill Road
Middletown, PA 17057

P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: CSWMA Work Order #: 3103620 Initials: _____ Date: W 5-24-20

- | | | | |
|--|-------------|------------|-----------|
| 1. Were airbills / tracking numbers present and recorded?..... | <u>NONE</u> | YES | NO |
| Tracking number: _____ | | | |
| 2. Are Custody Seals on shipping containers intact?..... | <u>NONE</u> | YES | NO |
| 3. Are Custody Seals on sample containers intact?..... | <u>NONE</u> | YES | NO |
| 4. Is there a COC (Chain-of-Custody) present?..... | | <u>YES</u> | NO |
| 5. Are the COC and bottle labels complete, legible and in agreement?..... | | <u>YES</u> | NO |
| 5a. Does the COC contain sample locations?..... | | <u>YES</u> | NO |
| 5b. Does the COC contain date and time of sample collection for all samples?..... | | <u>YES</u> | NO |
| 5c. Does the COC contain sample collectors name?..... | | <u>YES</u> | NO |
| 5d. Does the COC note the type(s) of preservation for all bottles?..... | | <u>YES</u> | NO |
| 5e. Does the COC note the number of bottles submitted for each sample?..... | | <u>YES</u> | NO |
| 5f. Does the COC note the type of sample, composite or grab?..... | | <u>YES</u> | NO |
| 5g. Does the COC note the matrix of the sample(s)?..... | | <u>YES</u> | NO |
| 6. Are all aqueous samples requiring preservation preserved correctly?..... | <u>N/A</u> | <u>YES</u> | NO |
| 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?..... | | <u>YES</u> | NO |
| 8. Are all samples within holding times for the requested analyses?..... | | <u>YES</u> | NO |
| 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)..... | | <u>YES</u> | NO |
| 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?..... | <u>N/A</u> | YES | NO |
| 11. Were the samples received on ice?..... | | <u>YES</u> | NO |
| 12. Were sample temperatures measured at 0.0-6.0°C..... | | <u>YES</u> | NO |
| 13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below..... | | YES | <u>NO</u> |
| 13a. Are the samples required for SDWA compliance reporting?..... | <u>N/A</u> | YES | NO |
| 13b. Did the client provide a SDWA PWS ID#?..... | <u>N/A</u> | YES | NO |
| 13c. Are all aqueous unpreserved SDWA samples pH 5-9?..... | <u>N/A</u> | YES | NO |
| 13d. Did the client provide the SDWA sample location ID/Description?..... | <u>N/A</u> | YES | NO |
| 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?..... | <u>N/A</u> | YES | NO |

Cooler #: 7
 Temperature (°C): 0
 Thermometer ID: 309
 Radiological (µCi): _____

COMMENTS (Required for all NO responses above and any sample non-conformance):

*Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis



June 12, 2020

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

| | | | |
|-----------------|------------------|---------------|-----------------------------------|
| Project Name: | FREY FARM | Workorder: | 3103148 |
| Purchase Order: | PO1000126 | Workorder ID: | 2ND QTR 2020 FFMP-FORM 19A |

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, May 19, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

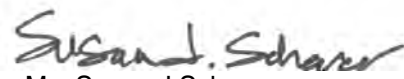
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki , Ms. Jordan Gallagher , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.


Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

| Lab ID | Sample ID | Matrix | Date Collected | Date Received | Collected By |
|------------|-----------|--------------|-----------------|-----------------|-------------------|
| 3103148001 | FFMP017W | Ground Water | 5/19/2020 09:39 | 5/19/2020 16:46 | Mr. Brian G Shade |
| 3103148002 | FFMP029W | Ground Water | 5/19/2020 11:02 | 5/19/2020 16:46 | Mr. Brian G Shade |
| 3103148003 | FFMP025W | Ground Water | 5/19/2020 11:43 | 5/19/2020 16:46 | Mr. Brian G Shade |
| 3103148004 | FFMP30RW | Ground Water | 5/19/2020 13:02 | 5/19/2020 16:46 | Mr. Brian G Shade |
| 3103148005 | FFMP04AW | Ground Water | 5/19/2020 14:10 | 5/19/2020 16:46 | Mr. Brian G Shade |

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Vancouver Waterloo · Winnipeg · Yellowknife **United States:** Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York **Mexico:** Monterrey

SAMPLE SUMMARY

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

| | |
|--------|--|
| J | Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte |
| U | Indicates that the analyte was Not Detected (ND) |
| N | Indicates presumptive evidence of the presence of a compound |
| MDL | Method Detection Limit |
| PQL | Practical Quantitation Limit |
| RDL | Reporting Detection Limit |
| ND | Not Detected - indicates that the analyte was Not Detected at the RDL |
| Cntr | Analysis was performed using this container |
| RegLmt | Regulatory Limit |
| LCS | Laboratory Control Sample |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| DUP | Sample Duplicate |
| %Rec | Percent Recovery |
| RPD | Relative Percent Difference |
| LOD | DoD Limit of Detection |
| LOQ | DoD Limit of Quantitation |
| DL | DoD Detection Limit |
| I | Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL) |
| (S) | Surrogate Compound |
| NC | Not Calculated |
| * | Result outside of QC limits |

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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3103148001**

Date Collected: 5/19/2020 09:39

Matrix: Ground Water

 Sample ID: **FFMP017W**

Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Bromochloromethane | ND | 3 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3103148001**

Date Collected: 5/19/2020 09:39

Matrix: Ground Water

 Sample ID: **FFMP017W**

Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 105 | | % | 62 - 133 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| 4-Bromofluorobenzene (S) | 105 | | % | 79 - 114 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Dibromofluoromethane (S) | 107 | | % | 78 - 116 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |
| Toluene-d8 (S) | 99.3 | | % | 76 - 127 | SW846 8260B | | | 5/22/20 00:19 | PDK | J |

LIBRARY SEARCH - VOLATILES

No TIC's Detected . Lib Search VOC 5/22/20 00:19 CPK J

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|-------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 79 | | mg/L | 5 | SM2320B-2011 | | | 5/21/20 22:37 | R2B | B |
| Alkalinity, Total | 79 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/21/20 22:37 | R2B | A |
| Ammonia-N | 0.312 | | mg/L | 0.100 | ASTM D6919-09 | | | 5/27/20 06:49 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/21/20 23:10 | JAM | C |
| Chloride | 355 | | mg/L | 5.0 | EPA 300.0 | | | 5/23/20 07:06 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/20/20 10:25 | MBW | B |
| Nitrate-N | 1.5 | | mg/L | 0.20 | EPA 300.0 | | | 5/20/20 10:25 | MBW | B |
| pH | 6.73 | 2 | pH_Units | | S4500HB-11 | | | 5/21/20 22:37 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/28/20 14:00 | VXF | 5/28/20 15:23 | C_D | I |
| Specific Conductance | 1500 | | umhos/cm | 1 | SM2510B-2011 | | | 5/21/20 22:37 | R2B | B |
| Sulfate | 72.9 | | mg/L | 2.0 | EPA 300.0 | | | 5/20/20 10:25 | MBW | B |
| Total Dissolved Solids | 1140 | | mg/L | 25 | S2540C-11 | | | 5/20/20 10:55 | KXH | B |
| Total Organic Carbon (TOC) | 2.9 | | mg/L | 0.50 | SM5310B-2011 | | | 6/10/20 23:10 | PAG | G |
| Turbidity | 0.44 | | NTU | 0.10 | SM2130B-2011 | | | 5/20/20 06:04 | R2B | B |

ALS Environmental Laboratory Locations Across North America

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103148001**

Date Collected: 5/19/2020 09:39

Matrix: Ground Water

Sample ID: **FFMP017W**

Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| Barium, Total | 0.13 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Barium, Dissolved | 0.14 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| Calcium, Total | 95.2 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Calcium, Dissolved | 103 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| Cobalt, Total | 0.055 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| Iron, Total | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| Magnesium, Total | 42.2 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Magnesium, Dissolved | 42.9 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| Manganese, Total | 2.5 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Manganese, Dissolved | 2.6 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/21/20 10:55 | AHI | 5/21/20 16:03 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/20/20 10:50 | AHI | 5/20/20 16:54 | AHI | D |
| Nickel, Total | 0.0092 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Potassium, Total | 7.3 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Potassium, Dissolved | 7.5 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| Sodium, Total | 96.7 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Sodium, Dissolved | 96.6 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |
| Zinc, Total | 0.011 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:16 | MSA | E1 |

ALS Environmental Laboratory Locations Across North America

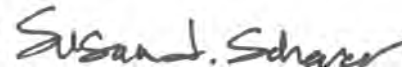
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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103148001** Date Collected: 5/19/2020 09:39 Matrix: Ground Water
 Sample ID: **FFMP017W** Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | 0.0093 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:50 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 39.42 | | Feet | | Field | | | 5/19/20 09:39 | BGS | F |
| Elev Top MW Casing above MSL | 480.70 | | Feet | | Field | | | 5/19/20 09:39 | BGS | F |
| Flow Rate | 2.11 | | gal/min | | Field | | | 5/19/20 09:39 | BGS | F |
| Ground Water Elevation | 441.28 | | ft/MSL | | Field | | | 5/19/20 09:39 | BGS | F |
| pH, Field (SM4500B) | 5.89 | | pH_Units | | Field | | | 5/19/20 09:39 | BGS | F |
| Sample Depth | 135.00 | | Feet | | Field | | | 5/19/20 09:39 | BGS | F |
| Specific Conductance, Field | 1523 | | umhos/cm | 1 | Field | | | 5/19/20 09:39 | BGS | F |
| Temperature | 9.55 | | Deg. C | | Field | | | 5/19/20 09:39 | BGS | F |
| Total Well Depth | 150.50 | | Feet | | Field | | | 5/19/20 09:39 | BGS | F |
| Volume in Water Column | 163.29 | | Gallons | | Field | | | 5/19/20 09:39 | BGS | F |
| Water Level After Purge | 48.29 | | Feet | | Field | | | 5/19/20 09:39 | BGS | F |
| Well Volumes Purged | 1.16 | | Vol | | Field | | | 5/19/20 09:39 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103148002**

Date Collected: 5/19/2020 11:02

Matrix: Ground Water

Sample ID: **FFMP029W**

Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Bromochloromethane | ND | 3 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3103148002**

Date Collected: 5/19/2020 11:02

Matrix: Ground Water

 Sample ID: **FFMP029W**

Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 104 | | % | 62 - 133 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| 4-Bromofluorobenzene (S) | 105 | | % | 79 - 114 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Dibromofluoromethane (S) | 106 | | % | 78 - 116 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |
| Toluene-d8 (S) | 99.7 | | % | 76 - 127 | SW846 8260B | | | 5/22/20 00:42 | PDK | J |

LIBRARY SEARCH - VOLATILES

No TIC's Detected . Lib Search VOC 5/22/20 00:42 CPK J

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 6 | | mg/L | 5 | SM2320B-2011 | | | 5/21/20 22:37 | R2B | B |
| Alkalinity, Total | 6 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/21/20 22:37 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/26/20 21:12 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/21/20 23:10 | JAM | C |
| Chloride | 40.0 | | mg/L | 2.0 | EPA 300.0 | | | 5/20/20 10:42 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/20/20 10:42 | MBW | B |
| Nitrate-N | 3.1 | | mg/L | 0.20 | EPA 300.0 | | | 5/20/20 10:42 | MBW | B |
| pH | 5.94 | 2 | pH_Units | | S4500HB-11 | | | 5/21/20 22:37 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/21/20 12:00 | VXF | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 195 | | umhos/cm | 1 | SM2510B-2011 | | | 5/21/20 22:37 | R2B | B |
| Sulfate | 2.5 | | mg/L | 2.0 | EPA 300.0 | | | 5/20/20 10:42 | MBW | B |
| Total Dissolved Solids | 150 | | mg/L | 25 | S2540C-11 | | | 5/20/20 10:55 | KXH | B |
| Total Organic Carbon (TOC) | ND | | mg/L | 0.50 | SM5310B-2011 | | | 5/20/20 19:51 | PAG | G |
| Turbidity | 0.17 | | NTU | 0.10 | SM2130B-2011 | | | 5/20/20 06:04 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3103148002**

Date Collected: 5/19/2020 11:02

Matrix: Ground Water

 Sample ID: **FFMP029W**

Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| Barium, Total | 0.048 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Barium, Dissolved | 0.049 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| Calcium, Total | 7.6 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Calcium, Dissolved | 8.2 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| Iron, Total | ND | | mg/L | 0.056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| Magnesium, Total | 6.3 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Magnesium, Dissolved | 6.6 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| Manganese, Total | 0.020 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Manganese, Dissolved | 0.031 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/21/20 10:55 | AHI | 5/21/20 16:04 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/20/20 10:50 | AHI | 5/20/20 16:55 | AHI | D |
| Nickel, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Potassium, Total | 1.6 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Potassium, Dissolved | 1.7 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| Sodium, Total | 15.0 | | mg/L | 0.11 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Sodium, Dissolved | 15.9 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |
| Zinc, Total | 0.0065 | | mg/L | 0.0056 | SW846 6020A | 5/25/20 21:10 | SXC | 5/28/20 05:34 | MSA | E |

ALS Environmental Laboratory Locations Across North America

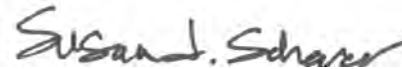
 Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103148002** Date Collected: 5/19/2020 11:02 Matrix: Ground Water
 Sample ID: **FFMP029W** Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:00 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 37.22 | | Feet | | Field | | | 5/19/20 11:02 | BGS | F |
| Elev Top MW Casing above MSL | 477.30 | | Feet | | Field | | | 5/19/20 11:02 | BGS | F |
| Flow Rate | 1.61 | | gal/min | | Field | | | 5/19/20 11:02 | BGS | F |
| Ground Water Elevation | 440.08 | | ft/MSL | | Field | | | 5/19/20 11:02 | BGS | F |
| pH, Field (SM4500B) | 5.15 | | pH_Units | | Field | | | 5/19/20 11:02 | BGS | F |
| Sample Depth | 55.00 | | Feet | | Field | | | 5/19/20 11:02 | BGS | F |
| Specific Conductance, Field | 210 | | umhos/cm | 1 | Field | | | 5/19/20 11:02 | BGS | F |
| Temperature | 11.41 | | Deg. C | | Field | | | 5/19/20 11:02 | BGS | F |
| Total Well Depth | 60.50 | | Feet | | Field | | | 5/19/20 11:02 | BGS | F |
| Volume in Water Column | 34.22 | | Gallons | | Field | | | 5/19/20 11:02 | BGS | F |
| Water Level After Purge | 44.12 | | Feet | | Field | | | 5/19/20 11:02 | BGS | F |
| Well Volumes Purged | 3.30 | | Vol | | Field | | | 5/19/20 11:02 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103148003** Date Collected: 5/19/2020 11:43 Matrix: Ground Water
Sample ID: **FFMP025W** Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Bromochloromethane | ND | 3 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

| | | |
|----------------------------|---------------------------------|----------------------|
| Lab ID: 3103148003 | Date Collected: 5/19/2020 11:43 | Matrix: Ground Water |
| Sample ID: FFMP025W | Date Received: 5/19/2020 16:46 | |

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 104 | | % | 62 - 133 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| 4-Bromofluorobenzene (S) | 105 | | % | 79 - 114 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Dibromofluoromethane (S) | 108 | | % | 78 - 116 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |
| Toluene-d8 (S) | 101 | | % | 76 - 127 | SW846 8260B | | | 5/22/20 01:05 | PDK | J |

LIBRARY SEARCH - VOLATILES

| | | | | |
|-------------------|----------------|---------------|-----|---|
| No TIC's Detected | Lib Search VOC | 5/22/20 01:05 | CPK | J |
|-------------------|----------------|---------------|-----|---|

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|-------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 31 | | mg/L | 5 | SM2320B-2011 | | | 5/21/20 22:37 | R2B | B |
| Alkalinity, Total | 31 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/21/20 22:37 | R2B | A |
| Ammonia-N | 0.111 | | mg/L | 0.100 | ASTM D6919-09 | | | 5/26/20 23:57 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/21/20 23:10 | JAM | C |
| Chloride | 53.5 | | mg/L | 2.0 | EPA 300.0 | | | 5/20/20 10:59 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/20/20 10:59 | MBW | B |
| Nitrate-N | 5.9 | | mg/L | 0.20 | EPA 300.0 | | | 5/20/20 10:59 | MBW | B |
| pH | 6.42 | 2 | pH_Units | | S4500HB-11 | | | 5/21/20 22:37 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/28/20 14:00 | VXF | 5/28/20 15:23 | C_D | I |
| Specific Conductance | 375 | | umhos/cm | 1 | SM2510B-2011 | | | 5/21/20 22:37 | R2B | B |
| Sulfate | 26.2 | | mg/L | 2.0 | EPA 300.0 | | | 5/20/20 10:59 | MBW | B |
| Total Dissolved Solids | 182 | | mg/L | 25 | S2540C-11 | | | 5/20/20 10:55 | KXH | B |
| Total Organic Carbon (TOC) | 1.1 | | mg/L | 0.50 | SM5310B-2011 | | | 5/20/20 19:51 | PAG | G |
| Turbidity | 0.11 | | NTU | 0.10 | SM2130B-2011 | | | 5/20/20 06:04 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3103148003** Date Collected: 5/19/2020 11:43 Matrix: Ground Water
 Sample ID: **FFMP025W** Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| Barium, Total | 0.048 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Barium, Dissolved | 0.053 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| Calcium, Total | 22.5 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Calcium, Dissolved | 21.3 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| Iron, Total | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| Magnesium, Total | 12.9 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Magnesium, Dissolved | 12.5 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| Manganese, Total | 0.0094 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Manganese, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/21/20 10:55 | AHI | 5/21/20 16:08 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/20/20 10:50 | AHI | 5/20/20 16:56 | AHI | D |
| Nickel, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Potassium, Total | 2.3 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Potassium, Dissolved | 2.4 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| Sodium, Total | 20.7 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Sodium, Dissolved | 19.6 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |
| Zinc, Total | 0.0069 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:20 | MSA | E1 |

ALS Environmental Laboratory Locations Across North America

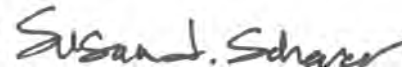
 Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103148003** Date Collected: 5/19/2020 11:43 Matrix: Ground Water
 Sample ID: **FFMP025W** Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | 0.0079 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:47 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 23.32 | | Feet | | Field | | | 5/19/20 11:43 | BGS | F |
| Elev Top MW Casing above MSL | 476.80 | | Feet | | Field | | | 5/19/20 11:43 | BGS | F |
| Flow Rate | 3.32 | | gal/min | | Field | | | 5/19/20 11:43 | BGS | F |
| Ground Water Elevation | 453.48 | | ft/MSL | | Field | | | 5/19/20 11:43 | BGS | F |
| pH, Field (SM4500B) | 5.61 | | pH_Units | | Field | | | 5/19/20 11:43 | BGS | F |
| Sample Depth | 39.00 | | Feet | | Field | | | 5/19/20 11:43 | BGS | F |
| Specific Conductance, Field | 374 | | umhos/cm | 1 | Field | | | 5/19/20 11:43 | BGS | F |
| Temperature | 9.07 | | Deg. C | | Field | | | 5/19/20 11:43 | BGS | F |
| Total Well Depth | 41.50 | | Feet | | Field | | | 5/19/20 11:43 | BGS | F |
| Volume in Water Column | 26.72 | | Gallons | | Field | | | 5/19/20 11:43 | BGS | F |
| Water Level After Purge | 24.01 | | Feet | | Field | | | 5/19/20 11:43 | BGS | F |
| Well Volumes Purged | 3.11 | | Vol | | Field | | | 5/19/20 11:43 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103148004**

Date Collected: 5/19/2020 13:02

Matrix: Ground Water

Sample ID: **FFMP30RW**

Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Bromochloromethane | ND | 3 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3103148004**

Date Collected: 5/19/2020 13:02

Matrix: Ground Water

 Sample ID: **FFMP30RW**

Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 105 | | % | 62 - 133 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| 4-Bromofluorobenzene (S) | 108 | | % | 79 - 114 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Dibromofluoromethane (S) | 109 | | % | 78 - 116 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |
| Toluene-d8 (S) | 102 | | % | 76 - 127 | SW846 8260B | | | 5/22/20 01:28 | PDK | J |

LIBRARY SEARCH - VOLATILES

No TIC's Detected . Lib Search VOC 5/22/20 01:28 CPK J

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|-------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 26 | | mg/L | 5 | SM2320B-2011 | | | 5/21/20 22:37 | R2B | B |
| Alkalinity, Total | 26 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/21/20 22:37 | R2B | A |
| Ammonia-N | 0.109 | | mg/L | 0.100 | ASTM D6919-09 | | | 5/27/20 03:50 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/21/20 23:10 | JAM | C |
| Chloride | 112 | | mg/L | 2.0 | EPA 300.0 | | | 5/20/20 11:16 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/20/20 11:16 | MBW | B |
| Nitrate-N | 4.1 | | mg/L | 0.20 | EPA 300.0 | | | 5/20/20 11:16 | MBW | B |
| pH | 6.03 | 2 | pH_Units | | S4500HB-11 | | | 5/21/20 22:37 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/21/20 12:00 | VXF | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 515 | | umhos/cm | 1 | SM2510B-2011 | | | 5/27/20 21:30 | R2B | B |
| Sulfate | 15.4 | | mg/L | 2.0 | EPA 300.0 | | | 5/20/20 11:16 | MBW | B |
| Total Dissolved Solids | 338 | | mg/L | 25 | S2540C-11 | | | 5/20/20 10:55 | KXH | B |
| Total Organic Carbon (TOC) | 0.87 | | mg/L | 0.50 | SM5310B-2011 | | | 5/20/20 19:51 | PAG | G |
| Turbidity | 1.02 | | NTU | 0.10 | SM2130B-2011 | | | 5/20/20 06:04 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

| | | |
|----------------------------|---------------------------------|----------------------|
| Lab ID: 3103148004 | Date Collected: 5/19/2020 13:02 | Matrix: Ground Water |
| Sample ID: FFMP30RW | Date Received: 5/19/2020 16:46 | |

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| Barium, Total | 0.058 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Barium, Dissolved | 0.060 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| Calcium, Total | 19.6 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Calcium, Dissolved | 19.9 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| Chromium, Total | 0.0023 | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| Cobalt, Total | 0.0084 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| Iron, Total | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| Magnesium, Total | 12.6 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Magnesium, Dissolved | 12.9 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| Manganese, Total | 0.92 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Manganese, Dissolved | 0.95 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| Mercury, Total | 0.00052 | | mg/L | 0.00050 | SW846 7470A | 5/21/20 10:55 | AHI | 5/21/20 16:09 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/20/20 10:50 | AHI | 5/20/20 16:58 | AHI | D |
| Nickel, Total | 0.012 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Potassium, Total | 2.6 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Potassium, Dissolved | 2.7 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| Sodium, Total | 50.6 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Sodium, Dissolved | 50.1 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |
| Zinc, Total | 0.0079 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:23 | MSA | E1 |

ALS Environmental Laboratory Locations Across North America

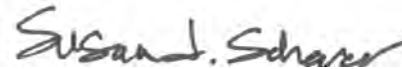
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 Vancouver Waterloo · Winnipeg · Yellowknife
 United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York
 Mexico: Monterrey

ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103148004** Date Collected: 5/19/2020 13:02 Matrix: Ground Water
 Sample ID: **FFMP30RW** Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | 0.0083 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:53 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 32.32 | | Feet | | Field | | | 5/19/20 13:02 | BGS | F |
| Elev Top MW Casing above MSL | 562.30 | | Feet | | Field | | | 5/19/20 13:02 | BGS | F |
| Flow Rate | 2.20 | | gal/min | | Field | | | 5/19/20 13:02 | BGS | F |
| Ground Water Elevation | 529.98 | | ft/MSL | | Field | | | 5/19/20 13:02 | BGS | F |
| pH, Field (SM4500B) | 5.21 | | pH_Units | | Field | | | 5/19/20 13:02 | BGS | F |
| Sample Depth | 85.00 | | Feet | | Field | | | 5/19/20 13:02 | BGS | F |
| Specific Conductance, Field | 536 | | umhos/cm | 1 | Field | | | 5/19/20 13:02 | BGS | F |
| Temperature | 10.32 | | Deg. C | | Field | | | 5/19/20 13:02 | BGS | F |
| Total Well Depth | 94.20 | | Feet | | Field | | | 5/19/20 13:02 | BGS | F |
| Volume in Water Column | 90.96 | | Gallons | | Field | | | 5/19/20 13:02 | BGS | F |
| Water Level After Purge | 37.15 | | Feet | | Field | | | 5/19/20 13:02 | BGS | F |
| Well Volumes Purged | 1.45 | | Vol | | Field | | | 5/19/20 13:02 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3103148005**

Date Collected: 5/19/2020 14:10

Matrix: Ground Water

 Sample ID: **FFMP04AW**

Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Bromochloromethane | ND | 3 | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

 Lab ID: **3103148005** Date Collected: 5/19/2020 14:10 Matrix: Ground Water
 Sample ID: **FFMP04AW** Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 104 | | % | 62 - 133 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| 4-Bromofluorobenzene (S) | 106 | | % | 79 - 114 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Dibromofluoromethane (S) | 107 | | % | 78 - 116 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |
| Toluene-d8 (S) | 100 | | % | 76 - 127 | SW846 8260B | | | 5/22/20 01:50 | PDK | J |

LIBRARY SEARCH - VOLATILES

No TIC's Detected . Lib Search VOC 5/22/20 01:50 CPK J

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 192 | | mg/L | 5 | SM2320B-2011 | | | 5/21/20 22:37 | R2B | B |
| Alkalinity, Total | 192 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/21/20 22:37 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/27/20 05:26 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/21/20 23:10 | JAM | C |
| Chloride | 301 | | mg/L | 5.0 | EPA 300.0 | | | 5/23/20 07:23 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/20/20 13:14 | MBW | B |
| Nitrate-N | 0.28 | | mg/L | 0.20 | EPA 300.0 | | | 5/20/20 13:14 | MBW | B |
| pH | 7.59 | 2 | pH_Units | | S4500HB-11 | | | 5/21/20 22:37 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/21/20 12:00 | VXF | 5/26/20 11:17 | VXF | I |
| Specific Conductance | 1430 | | umhos/cm | 1 | SM2510B-2011 | | | 5/27/20 21:30 | R2B | B |
| Sulfate | 46.8 | | mg/L | 2.0 | EPA 300.0 | | | 5/20/20 13:14 | MBW | B |
| Total Dissolved Solids | 918 | | mg/L | 25 | S2540C-11 | | | 5/20/20 10:55 | KXH | B |
| Total Organic Carbon (TOC) | 0.84 | | mg/L | 0.50 | SM5310B-2011 | | | 5/20/20 19:51 | PAG | G |
| Turbidity | 0.54 | | NTU | 0.10 | SM2130B-2011 | | | 5/20/20 06:04 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103148005**

Date Collected: 5/19/2020 14:10

Matrix: Ground Water

Sample ID: **FFMP04AW**

Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| Barium, Total | 0.19 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Barium, Dissolved | 0.19 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| Calcium, Total | 136 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Calcium, Dissolved | 142 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| Chromium, Total | 0.0025 | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| Iron, Total | 0.067 | | mg/L | 0.056 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| Magnesium, Total | 25.1 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Magnesium, Dissolved | 25.4 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| Manganese, Total | 0.31 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Manganese, Dissolved | 0.33 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/21/20 10:55 | AHI | 5/21/20 16:10 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/20/20 10:50 | AHI | 5/20/20 16:59 | AHI | D |
| Nickel, Total | 0.011 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Potassium, Total | 2.2 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Potassium, Dissolved | 2.2 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| Sodium, Total | 82.7 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:15 | AHI | 5/26/20 01:50 | MSA | E1 |
| Sodium, Dissolved | 84.3 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |
| Zinc, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:15 | AHI | 5/23/20 07:02 | MSA | E1 |

ALS Environmental Laboratory Locations Across North America

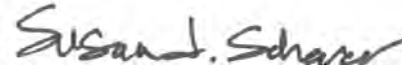
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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

Lab ID: **3103148005** Date Collected: 5/19/2020 14:10 Matrix: Ground Water
 Sample ID: **FFMP04AW** Date Received: 5/19/2020 16:46

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 11:57 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 31.94 | | Feet | | Field | | | 5/19/20 14:10 | BGS | F |
| Elev Top MW Casing above MSL | 560.72 | | Feet | | Field | | | 5/19/20 14:10 | BGS | F |
| Flow Rate | 2.15 | | gal/min | | Field | | | 5/19/20 14:10 | BGS | F |
| Ground Water Elevation | 528.78 | | ft/MSL | | Field | | | 5/19/20 14:10 | BGS | F |
| pH, Field (SM4500B) | 6.90 | | pH_Units | | Field | | | 5/19/20 14:10 | BGS | F |
| Sample Depth | 146.00 | | Feet | | Field | | | 5/19/20 14:10 | BGS | F |
| Specific Conductance, Field | 1465 | | umhos/cm | 1 | Field | | | 5/19/20 14:10 | BGS | F |
| Temperature | 10.81 | | Deg. C | | Field | | | 5/19/20 14:10 | BGS | F |
| Total Well Depth | 148.50 | | Feet | | Field | | | 5/19/20 14:10 | BGS | F |
| Volume in Water Column | 171.34 | | Gallons | | Field | | | 5/19/20 14:10 | BGS | F |
| Water Level After Purge | 80.32 | | Feet | | Field | | | 5/19/20 14:10 | BGS | F |
| Well Volumes Purged | 0.75 | | Vol | | Field | | | 5/19/20 14:10 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

PARAMETER QUALIFIERS

| Lab ID | # | Sample ID | Analytical Method | Analyte |
|---|---|-----------|-------------------|--------------------|
| 3103148001 | 1 | FFMP017W | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L. | | | | |
| 3103148001 | 2 | FFMP017W | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3103148001 | 3 | FFMP017W | SW846 8260B | Bromochloromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Bromochloromethane. The % Recovery was reported as 126 and the control limits were 73 to 117. | | | | |
| 3103148002 | 1 | FFMP029W | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L. | | | | |
| 3103148002 | 2 | FFMP029W | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3103148002 | 3 | FFMP029W | SW846 8260B | Bromochloromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Bromochloromethane. The % Recovery was reported as 126 and the control limits were 73 to 117. | | | | |
| 3103148003 | 1 | FFMP025W | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L. | | | | |
| 3103148003 | 2 | FFMP025W | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3103148003 | 3 | FFMP025W | SW846 8260B | Bromochloromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Bromochloromethane. The % Recovery was reported as 126 and the control limits were 73 to 117. | | | | |
| 3103148004 | 1 | FFMP30RW | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L. | | | | |
| 3103148004 | 2 | FFMP30RW | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3103148004 | 3 | FFMP30RW | SW846 8260B | Bromochloromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Bromochloromethane. The % Recovery was reported as 126 and the control limits were 73 to 117. | | | | |
| 3103148005 | 1 | FFMP04AW | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L. | | | | |
| 3103148005 | 2 | FFMP04AW | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3103148005 | 3 | FFMP04AW | SW846 8260B | Bromochloromethane |
| The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Bromochloromethane. The % Recovery was reported as 126 and the control limits were 73 to 117. | | | | |

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

| Lab ID | Sample ID | Analysis Method | Prep Method | Leachate Method |
|------------|-----------|-----------------|-------------|-----------------|
| 3103148001 | FFMP017W | ASTM D6919-09 | | |
| 3103148001 | FFMP017W | EPA 300.0 | | |
| 3103148001 | FFMP017W | EPA 410.4 | | |
| 3103148001 | FFMP017W | Field | | |
| 3103148001 | FFMP017W | Lib Search VOC | | |
| 3103148001 | FFMP017W | S2540C-11 | | |
| 3103148001 | FFMP017W | S4500HB-11 | | |
| 3103148001 | FFMP017W | SM2130B-2011 | | |
| 3103148001 | FFMP017W | SM2320B-2011 | | |
| 3103148001 | FFMP017W | SM2510B-2011 | | |
| 3103148001 | FFMP017W | SM5310B-2011 | | |
| 3103148001 | FFMP017W | SW846 6020A | SW846 3015 | |
| 3103148001 | FFMP017W | SW846 7470A | SW846 7470A | |
| 3103148001 | FFMP017W | SW846 8260B | | |
| 3103148001 | FFMP017W | SW846 9066 | 420.4/9066 | |
| 3103148002 | FFMP029W | ASTM D6919-09 | | |
| 3103148002 | FFMP029W | EPA 300.0 | | |
| 3103148002 | FFMP029W | EPA 410.4 | | |
| 3103148002 | FFMP029W | Field | | |
| 3103148002 | FFMP029W | Lib Search VOC | | |
| 3103148002 | FFMP029W | S2540C-11 | | |
| 3103148002 | FFMP029W | S4500HB-11 | | |
| 3103148002 | FFMP029W | SM2130B-2011 | | |
| 3103148002 | FFMP029W | SM2320B-2011 | | |
| 3103148002 | FFMP029W | SM2510B-2011 | | |
| 3103148002 | FFMP029W | SM5310B-2011 | | |
| 3103148002 | FFMP029W | SW846 6020A | SW846 3015 | |
| 3103148002 | FFMP029W | SW846 7470A | SW846 7470A | |
| 3103148002 | FFMP029W | SW846 8260B | | |
| 3103148002 | FFMP029W | SW846 9066 | 420.4/9066 | |
| 3103148003 | FFMP025W | ASTM D6919-09 | | |
| 3103148003 | FFMP025W | EPA 300.0 | | |
| 3103148003 | FFMP025W | EPA 410.4 | | |
| 3103148003 | FFMP025W | Field | | |
| 3103148003 | FFMP025W | Lib Search VOC | | |
| 3103148003 | FFMP025W | S2540C-11 | | |
| 3103148003 | FFMP025W | S4500HB-11 | | |
| 3103148003 | FFMP025W | SM2130B-2011 | | |
| 3103148003 | FFMP025W | SM2320B-2011 | | |
| 3103148003 | FFMP025W | SM2510B-2011 | | |
| 3103148003 | FFMP025W | SM5310B-2011 | | |
| 3103148003 | FFMP025W | SW846 6020A | SW846 3015 | |
| 3103148003 | FFMP025W | SW846 7470A | SW846 7470A | |
| 3103148003 | FFMP025W | SW846 8260B | | |
| 3103148003 | FFMP025W | SW846 9066 | 420.4/9066 | |
| 3103148004 | FFMP30RW | ASTM D6919-09 | | |

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3103148 2ND QTR 2020 FFMP-FORM 19A

| Lab ID | Sample ID | Analysis Method | Prep Method | Leachate Method |
|------------|-----------|-----------------|-------------|-----------------|
| 3103148004 | FFMP30RW | EPA 300.0 | | |
| 3103148004 | FFMP30RW | EPA 410.4 | | |
| 3103148004 | FFMP30RW | Field | | |
| 3103148004 | FFMP30RW | Lib Search VOC | | |
| 3103148004 | FFMP30RW | S2540C-11 | | |
| 3103148004 | FFMP30RW | S4500HB-11 | | |
| 3103148004 | FFMP30RW | SM2130B-2011 | | |
| 3103148004 | FFMP30RW | SM2320B-2011 | | |
| 3103148004 | FFMP30RW | SM2510B-2011 | | |
| 3103148004 | FFMP30RW | SM5310B-2011 | | |
| 3103148004 | FFMP30RW | SW846 6020A | SW846 3015 | |
| 3103148004 | FFMP30RW | SW846 7470A | SW846 7470A | |
| 3103148004 | FFMP30RW | SW846 8260B | | |
| 3103148004 | FFMP30RW | SW846 9066 | 420.4/9066 | |
| 3103148005 | FFMP04AW | ASTM D6919-09 | | |
| 3103148005 | FFMP04AW | EPA 300.0 | | |
| 3103148005 | FFMP04AW | EPA 410.4 | | |
| 3103148005 | FFMP04AW | Field | | |
| 3103148005 | FFMP04AW | Lib Search VOC | | |
| 3103148005 | FFMP04AW | S2540C-11 | | |
| 3103148005 | FFMP04AW | S4500HB-11 | | |
| 3103148005 | FFMP04AW | SM2130B-2011 | | |
| 3103148005 | FFMP04AW | SM2320B-2011 | | |
| 3103148005 | FFMP04AW | SM2510B-2011 | | |
| 3103148005 | FFMP04AW | SM5310B-2011 | | |
| 3103148005 | FFMP04AW | SW846 6020A | SW846 3015 | |
| 3103148005 | FFMP04AW | SW846 7470A | SW846 7470A | |
| 3103148005 | FFMP04AW | SW846 8260B | | |
| 3103148005 | FFMP04AW | SW846 9066 | 420.4/9066 | |

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301 Fulling Mill Road
Middletown, PA 17057

P: (717) 944-5541

F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSH/MA Work Order #: 3103148 Initials: TS Date: 5/9/20

- 1. Were airbills / tracking numbers present and recorded?..... NONE YES NO
Tracking number: _____
- 2. Are Custody Seals on shipping containers intact?..... NONE YES NO
- 3. Are Custody Seals on sample containers intact?..... NONE YES NO
- 4. Is there a COC (Chain-of-Custody) present?..... YES NO
- 5. Are the COC and bottle labels complete, legible and in agreement?..... YES NO
 - 5a. Does the COC contain sample locations?..... YES NO
 - 5b. Does the COC contain date and time of sample collection for all samples?..... YES NO
 - 5c. Does the COC contain sample collectors name?..... YES NO
 - 5d. Does the COC note the type(s) of preservation for all bottles?..... YES NO
 - 5e. Does the COC note the number of bottles submitted for each sample?..... YES NO
 - 5f. Does the COC note the type of sample, composite or grab?..... YES NO
 - 5g. Does the COC note the matrix of the sample(s)?..... YES NO
- 6. Are all aqueous samples requiring preservation preserved correctly?¹..... N/A YES NO
- 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?..... YES NO
- 8. Are all samples within holding times for the requested analyses?..... YES NO
- 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)..... YES NO
- 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?..... N/A YES NO
- 11. Were the samples received on ice?..... YES NO
- 12. Were sample temperatures measured at 0.0-6.0°C..... YES NO
- 13. Are the samples DW matrix ? IF YES, fill out Reportable Drinking Water questions below..... YES NO
 - 13a. Are the samples required for SDWA compliance reporting?..... N/A YES NO
 - 13b. Did the client provide a SDWA PWS ID#?..... N/A YES NO
 - 13c. Are all aqueous unpreserved SDWA samples pH 5-9?..... N/A YES NO
 - 13d. Did the client provide the SDWA sample location ID/Description?..... N/A YES NO
 - 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?..... N/A YES NO

Cooler #: _____

Temperature (°C): 2 _____

Thermometer ID: SJ3 _____

Radiological (µCi): _____

COMMENTS (Required for all NO responses above and any sample non-conformance):

¹Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis



May 26, 2020

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

| | | | |
|-----------------|------------------|---------------|-------------------------|
| Project Name: | FREY FARM | Workorder: | 3102944 |
| Purchase Order: | PO1000126 | Workorder ID: | Frey Farm Annual |

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Monday, May 18, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

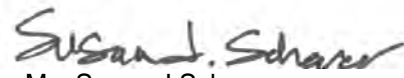
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki , Ms. Jordan Gallagher , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.



Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3102944 Frey Farm Annual

| Lab ID | Sample ID | Matrix | Date Collected | Date Received | Collected By |
|------------|-----------|--------------|-----------------|-----------------|-------------------|
| 3102944001 | FFMP015W | Ground Water | 5/18/2020 10:13 | 5/18/2020 15:55 | Mr. Brian G Shade |
| 3102944002 | FFMP033W | Ground Water | 5/18/2020 11:30 | 5/18/2020 15:55 | Mr. Brian G Shade |
| 3102944003 | FFMP028W | Ground Water | 5/18/2020 14:34 | 5/18/2020 15:55 | Mr. Brian G Shade |

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SAMPLE SUMMARY

Workorder: 3102944 Frey Farm Annual

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

| | |
|--------|--|
| J | Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte |
| U | Indicates that the analyte was Not Detected (ND) |
| N | Indicates presumptive evidence of the presence of a compound |
| MDL | Method Detection Limit |
| PQL | Practical Quantitation Limit |
| RDL | Reporting Detection Limit |
| ND | Not Detected - indicates that the analyte was Not Detected at the RDL |
| Cntr | Analysis was performed using this container |
| RegLmt | Regulatory Limit |
| LCS | Laboratory Control Sample |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| DUP | Sample Duplicate |
| %Rec | Percent Recovery |
| RPD | Relative Percent Difference |
| LOD | DoD Limit of Detection |
| LOQ | DoD Limit of Quantitation |
| DL | DoD Detection Limit |
| I | Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL) |
| (S) | Surrogate Compound |
| NC | Not Calculated |
| * | Result outside of QC limits |

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ANALYTICAL RESULTS

Workorder: 3102944 Frey Farm Annual

Lab ID: **3102944001**

Date Collected: 5/18/2020 10:13

Matrix: Ground Water

Sample ID: **FFMP015W**

Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Bromochloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |

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ANALYTICAL RESULTS

Workorder: 3102944 Frey Farm Annual

Lab ID: **3102944001** Date Collected: 5/18/2020 10:13 Matrix: Ground Water
 Sample ID: **FFMP015W** Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|---------------------------|---------|------|-------|----------|-------------|----------|----|---------------|-----|------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Surrogate Recoveries | Results | Flag | Units | Limits | Method | Prepared | By | Analyzed | By | Cntr |
| 1,2-Dichloroethane-d4 (S) | 93.3 | | % | 62 - 133 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| 4-Bromofluorobenzene (S) | 100 | | % | 79 - 114 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Dibromofluoromethane (S) | 82.7 | | % | 78 - 116 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |
| Toluene-d8 (S) | 93.8 | | % | 76 - 127 | SW846 8260B | | | 5/20/20 21:34 | TMP | J |

LIBRARY SEARCH - VOLATILES

No TIC's Detected . Lib Search VOC 5/20/20 21:34 CPK J

WET CHEMISTRY

| | | | | | | | | | | |
|------------------------------|------|---|----------|-------|---------------|---------------|-----|---------------|-----|---|
| Alkalinity, Bicarbonate | 20 | | mg/L | 5 | SM2320B-2011 | | | 5/19/20 23:20 | R2B | B |
| Alkalinity, Total | 20 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/19/20 23:20 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/24/20 03:50 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/19/20 01:43 | JAM | C |
| Chloride | 31.2 | | mg/L | 2.0 | EPA 300.0 | | | 5/19/20 12:57 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/19/20 12:57 | MBW | B |
| Nitrate-N | 35.9 | | mg/L | 0.50 | EPA 300.0 | | | 5/20/20 05:54 | MBW | B |
| pH | 6.33 | 2 | pH_Units | | S4500HB-11 | | | 5/19/20 23:20 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/19/20 12:00 | VXF | 5/19/20 14:40 | C_D | I |
| Specific Conductance | 503 | | umhos/cm | 1 | SM2510B-2011 | | | 5/19/20 23:20 | R2B | B |
| Sulfate | 24.6 | | mg/L | 2.0 | EPA 300.0 | | | 5/19/20 12:57 | MBW | B |
| Total Dissolved Solids | 344 | | mg/L | 25 | S2540C-11 | | | 5/20/20 10:55 | KXH | B |
| Total Organic Carbon (TOC) | 1.2 | | mg/L | 0.50 | SM5310B-2011 | | | 5/19/20 21:59 | PAG | G |
| Turbidity | 0.10 | | NTU | 0.10 | SM2130B-2011 | | | 5/19/20 06:34 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3102944 Frey Farm Annual

 Lab ID: **3102944001**

Date Collected: 5/18/2020 10:13

Matrix: Ground Water

 Sample ID: **FFMP015W**

Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:47 | MSA | D1 |
| Barium, Total | 0.085 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Barium, Dissolved | 0.088 | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:47 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:47 | MSA | D1 |
| Calcium, Total | 21.7 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Calcium, Dissolved | 22.3 | | mg/L | 0.11 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:47 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:47 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:47 | MSA | D1 |
| Iron, Total | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:47 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:47 | MSA | D1 |
| Magnesium, Total | 24.9 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Magnesium, Dissolved | 24.4 | | mg/L | 0.11 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:47 | MSA | D1 |
| Manganese, Total | 0.033 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Manganese, Dissolved | 0.032 | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:47 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/20/20 10:50 | AHI | 5/20/20 15:47 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/20/20 10:50 | AHI | 5/20/20 16:42 | AHI | D |
| Nickel, Total | 0.0059 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Potassium, Total | 2.5 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Potassium, Dissolved | 2.5 | | mg/L | 0.11 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:47 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:47 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:47 | MSA | D1 |
| Sodium, Total | 26.0 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Sodium, Dissolved | 24.9 | | mg/L | 0.11 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:47 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |
| Zinc, Total | 0.031 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:10 | MSA | E1 |

ALS Environmental Laboratory Locations Across North America

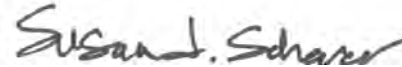
Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
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 United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York
 Mexico: Monterrey

ANALYTICAL RESULTS

Workorder: 3102944 Frey Farm Annual

Lab ID: **3102944001** Date Collected: 5/18/2020 10:13 Matrix: Ground Water
 Sample ID: **FFMP015W** Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared By | Analyzed By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|-------------------|-------------------|------|
| Zinc, Dissolved | 0.034 | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 SXC | 5/20/20 02:47 MSA | D1 |
| FIELD PARAMETERS | | | | | | | | |
| Depth to Water Level | 60.82 | | Feet | | Field | | 5/18/20 10:13 BGS | F |
| Elev Top MW Casing above MSL | 576.40 | | Feet | | Field | | 5/18/20 10:13 BGS | F |
| Flow Rate | 1.73 | | gal/min | | Field | | 5/18/20 10:13 BGS | F |
| Ground Water Elevation | 515.58 | | ft/MSL | | Field | | 5/18/20 10:13 BGS | F |
| pH, Field (SM4500B) | 5.43 | | pH_Units | | Field | | 5/18/20 10:13 BGS | F |
| Sample Depth | 135.00 | | Feet | | Field | | 5/18/20 10:13 BGS | F |
| Specific Conductance, Field | 556 | | umhos/cm | 1 | Field | | 5/18/20 10:13 BGS | F |
| Temperature | 11.41 | | Deg. C | | Field | | 5/18/20 10:13 BGS | F |
| Total Well Depth | 149.90 | | Feet | | Field | | 5/18/20 10:13 BGS | F |
| Volume in Water Column | 130.95 | | Gallons | | Field | | 5/18/20 10:13 BGS | F |
| Water Level After Purge | 107.71 | | Feet | | Field | | 5/18/20 10:13 BGS | F |
| Well Volumes Purged | 1.01 | | Vol | | Field | | 5/18/20 10:13 BGS | F |



Ms. Susan J Scherer
 Project Coordinator

ALS Environmental Laboratory Locations Across North America

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ANALYTICAL RESULTS

Workorder: 3102944 Frey Farm Annual

Lab ID: **3102944002**

Date Collected: 5/18/2020 11:30

Matrix: Ground Water

Sample ID: **FFMP033W**

Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Bromochloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |

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ANALYTICAL RESULTS

Workorder: 3102944 Frey Farm Annual

Lab ID: **3102944002**
Sample ID: **FFMP033W**

Date Collected: 5/18/2020 11:30 Matrix: Ground Water
Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------------|----------------|-------------|--------------|---------------|---------------|-----------------|-----------|-----------------|-----------|-------------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| <i>Surrogate Recoveries</i> | <i>Results</i> | <i>Flag</i> | <i>Units</i> | <i>Limits</i> | <i>Method</i> | <i>Prepared</i> | <i>By</i> | <i>Analyzed</i> | <i>By</i> | <i>Cntr</i> |
| 1,2-Dichloroethane-d4 (S) | 94.4 | | % | 62 - 133 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| 4-Bromofluorobenzene (S) | 99.2 | | % | 79 - 114 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Dibromofluoromethane (S) | 80.6 | | % | 78 - 116 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Toluene-d8 (S) | 94.4 | | % | 76 - 127 | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| Library Search - Volatiles | | | | | | | | | | |
| Unknown | 5.1 | J | ug/L | | SW846 8260B | | | 5/20/20 21:56 | TMP | J |
| WET CHEMISTRY | | | | | | | | | | |
| Alkalinity, Bicarbonate | 42 | | mg/L | 5 | SM2320B-2011 | | | 5/19/20 23:20 | R2B | B |
| Alkalinity, Total | 42 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/19/20 23:20 | R2B | A |
| Ammonia-N | 0.695 | | mg/L | 0.100 | ASTM D6919-09 | | | 5/24/20 04:45 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/19/20 01:43 | JAM | C |
| Chloride | 40.4 | | mg/L | 2.0 | EPA 300.0 | | | 5/19/20 14:55 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/19/20 14:55 | MBW | B |
| Nitrate-N | 10.8 | | mg/L | 0.20 | EPA 300.0 | | | 5/19/20 14:55 | MBW | B |
| pH | 6.77 | 2 | pH_Units | | S4500HB-11 | | | 5/19/20 23:20 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/19/20 12:00 | VXF | 5/19/20 14:40 | C_D | I |
| Specific Conductance | 334 | | umhos/cm | 1 | SM2510B-2011 | | | 5/19/20 23:20 | R2B | B |
| Sulfate | 6.2 | | mg/L | 2.0 | EPA 300.0 | | | 5/19/20 14:55 | MBW | B |
| Total Dissolved Solids | 220 | | mg/L | 25 | S2540C-11 | | | 5/20/20 10:55 | KXH | B |
| Total Organic Carbon (TOC) | 0.68 | | mg/L | 0.50 | SM5310B-2011 | | | 5/19/20 21:59 | PAG | G |
| Turbidity | 6.09 | | NTU | 0.10 | SM2130B-2011 | | | 5/19/20 06:34 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3102944 Frey Farm Annual

Lab ID: **3102944002**

Date Collected: 5/18/2020 11:30

Matrix: Ground Water

Sample ID: **FFMP033W**

Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| Barium, Total | 0.046 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Barium, Dissolved | 0.048 | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| Calcium, Total | 25.3 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Calcium, Dissolved | 24.5 | | mg/L | 0.11 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| Iron, Total | 5.5 | | mg/L | 0.056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Iron, Dissolved | 5.3 | | mg/L | 0.056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| Magnesium, Total | 9.0 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Magnesium, Dissolved | 8.8 | | mg/L | 0.11 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| Manganese, Total | 0.41 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Manganese, Dissolved | 0.39 | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/20/20 10:50 | AHI | 5/20/20 15:49 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/20/20 10:50 | AHI | 5/20/20 16:45 | AHI | D |
| Nickel, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Potassium, Total | 1.5 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Potassium, Dissolved | 1.5 | | mg/L | 0.11 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| Sodium, Total | 13.6 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Sodium, Dissolved | 13.3 | | mg/L | 0.11 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |
| Zinc, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:06 | MSA | E1 |

ALS Environmental Laboratory Locations Across North America

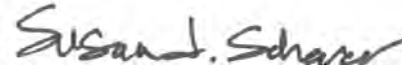
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ANALYTICAL RESULTS

Workorder: 3102944 Frey Farm Annual

Lab ID: **3102944002** Date Collected: 5/18/2020 11:30 Matrix: Ground Water
 Sample ID: **FFMP033W** Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:50 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 17.91 | | Feet | | Field | | | 5/18/20 11:30 | BGS | F |
| Elev Top MW Casing above MSL | 516.52 | | Feet | | Field | | | 5/18/20 11:30 | BGS | F |
| Flow Rate | 1.90 | | gal/min | | Field | | | 5/18/20 11:30 | BGS | F |
| Ground Water Elevation | 498.61 | | ft/MSL | | Field | | | 5/18/20 11:30 | BGS | F |
| pH, Field (SM4500B) | 5.80 | | pH_Units | | Field | | | 5/18/20 11:30 | BGS | F |
| Sample Depth | 79.00 | | Feet | | Field | | | 5/18/20 11:30 | BGS | F |
| Specific Conductance, Field | 384 | | umhos/cm | 1 | Field | | | 5/18/20 11:30 | BGS | F |
| Temperature | 11.75 | | Deg. C | | Field | | | 5/18/20 11:30 | BGS | F |
| Total Well Depth | 100.00 | | Feet | | Field | | | 5/18/20 11:30 | BGS | F |
| Volume in Water Column | 120.67 | | Gallons | | Field | | | 5/18/20 11:30 | BGS | F |
| Water Level After Purge | 30.02 | | Feet | | Field | | | 5/18/20 11:30 | BGS | F |
| Well Volumes Purged | 0.95 | | Vol | | Field | | | 5/18/20 11:30 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3102944 Frey Farm Annual

 Lab ID: **3102944003**

Date Collected: 5/18/2020 14:34

Matrix: Ground Water

 Sample ID: **FFMP028W**

Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Bromochloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |

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ANALYTICAL RESULTS

Workorder: 3102944 Frey Farm Annual

Lab ID: **3102944003**

Date Collected: 5/18/2020 14:34

Matrix: Ground Water

Sample ID: **FFMP028W**

Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------------|----------------|-------------|--------------|---------------|---------------|-----------------|-----------|-----------------|-----------|-------------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| <i>Surrogate Recoveries</i> | <i>Results</i> | <i>Flag</i> | <i>Units</i> | <i>Limits</i> | <i>Method</i> | <i>Prepared</i> | <i>By</i> | <i>Analyzed</i> | <i>By</i> | <i>Cntr</i> |
| 1,2-Dichloroethane-d4 (S) | 97.7 | | % | 62 - 133 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| 4-Bromofluorobenzene (S) | 101 | | % | 79 - 114 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Dibromofluoromethane (S) | 83.6 | | % | 78 - 116 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Toluene-d8 (S) | 94.6 | | % | 76 - 127 | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| Library Search - Volatiles | | | | | | | | | | |
| Unknown | 5.1 | J | ug/L | | SW846 8260B | | | 5/20/20 22:18 | TMP | J |
| WET CHEMISTRY | | | | | | | | | | |
| Alkalinity, Bicarbonate | 27 | | mg/L | 5 | SM2320B-2011 | | | 5/19/20 23:20 | R2B | B |
| Alkalinity, Total | 27 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/19/20 23:20 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/24/20 02:42 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/19/20 01:43 | JAM | C |
| Chloride | 84.7 | | mg/L | 2.0 | EPA 300.0 | | | 5/19/20 15:12 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/19/20 15:12 | MBW | B |
| Nitrate-N | 16.3 | | mg/L | 0.20 | EPA 300.0 | | | 5/19/20 15:12 | MBW | B |
| pH | 6.52 | 2 | pH_Units | | S4500HB-11 | | | 5/19/20 23:20 | R2B | B |
| Phenolics | ND | | mg/L | 0.005 | SW846 9066 | 5/19/20 12:00 | VXF | 5/19/20 14:40 | C_D | I |
| Specific Conductance | 545 | | umhos/cm | 1 | SM2510B-2011 | | | 5/19/20 23:20 | R2B | B |
| Sulfate | 24.3 | | mg/L | 2.0 | EPA 300.0 | | | 5/19/20 15:12 | MBW | B |
| Total Dissolved Solids | 378 | | mg/L | 25 | S2540C-11 | | | 5/20/20 10:55 | KXH | B |
| Total Organic Carbon (TOC) | 1.3 | | mg/L | 0.50 | SM5310B-2011 | | | 5/19/20 21:59 | PAG | G |
| Turbidity | 0.16 | | NTU | 0.10 | SM2130B-2011 | | | 5/19/20 06:34 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3102944 Frey Farm Annual

Lab ID: **3102944003**

Date Collected: 5/18/2020 14:34

Matrix: Ground Water

Sample ID: **FFMP028W**

Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| Barium, Total | 0.063 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Barium, Dissolved | 0.065 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| Calcium, Total | 36.5 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Calcium, Dissolved | 37.2 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| Iron, Total | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Iron, Dissolved | ND | | mg/L | 0.056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| Magnesium, Total | 16.7 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Magnesium, Dissolved | 17.1 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| Manganese, Total | 0.0073 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Manganese, Dissolved | 0.010 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/20/20 10:50 | AHI | 5/20/20 15:50 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/20/20 10:50 | AHI | 5/20/20 16:47 | AHI | D |
| Nickel, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Potassium, Total | 2.1 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Potassium, Dissolved | 2.1 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| Sodium, Total | 26.6 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Sodium, Dissolved | 27.2 | | mg/L | 0.11 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |
| Zinc, Total | 0.011 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:13 | MSA | E1 |

ALS Environmental Laboratory Locations Across North America

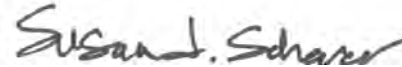
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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

ANALYTICAL RESULTS

Workorder: 3102944 Frey Farm Annual

Lab ID: **3102944003** Date Collected: 5/18/2020 14:34 Matrix: Ground Water
 Sample ID: **FFMP028W** Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | 0.012 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 13:35 | AHI | 5/23/20 12:25 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 10.59 | | Feet | | Field | | | 5/18/20 14:34 | BGS | F |
| Elev Top MW Casing above MSL | 465.00 | | Feet | | Field | | | 5/18/20 14:34 | BGS | F |
| Flow Rate | 2.95 | | gal/min | | Field | | | 5/18/20 14:34 | BGS | F |
| Ground Water Elevation | 454.41 | | ft/MSL | | Field | | | 5/18/20 14:34 | BGS | F |
| pH, Field (SM4500B) | 5.48 | | pH_Units | | Field | | | 5/18/20 14:34 | BGS | F |
| Sample Depth | 50.00 | | Feet | | Field | | | 5/18/20 14:34 | BGS | F |
| Specific Conductance, Field | 575 | | umhos/cm | 1 | Field | | | 5/18/20 14:34 | BGS | F |
| Temperature | 9.91 | | Deg. C | | Field | | | 5/18/20 14:34 | BGS | F |
| Total Well Depth | 60.00 | | Feet | | Field | | | 5/18/20 14:34 | BGS | F |
| Volume in Water Column | 72.63 | | Gallons | | Field | | | 5/18/20 14:34 | BGS | F |
| Water Level After Purge | 36.93 | | Feet | | Field | | | 5/18/20 14:34 | BGS | F |
| Well Volumes Purged | 2.44 | | Vol | | Field | | | 5/18/20 14:34 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3102944 Frey Farm Annual

PARAMETER QUALIFIERS

| Lab ID | # | Sample ID | Analytical Method | Analyte |
|---|---|-----------|-------------------|-------------------|
| 3102944001 | 1 | FFMP015W | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L. | | | | |
| 3102944001 | 2 | FFMP015W | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3102944002 | 1 | FFMP033W | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L. | | | | |
| 3102944002 | 2 | FFMP033W | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3102944003 | 1 | FFMP028W | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L. | | | | |
| 3102944003 | 2 | FFMP028W | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3102944 Frey Farm Annual

| Lab ID | Sample ID | Analysis Method | Prep Method | Leachate Method |
|------------|-----------|-----------------|-------------|-----------------|
| 3102944001 | FFMP015W | ASTM D6919-09 | | |
| 3102944001 | FFMP015W | EPA 300.0 | | |
| 3102944001 | FFMP015W | EPA 410.4 | | |
| 3102944001 | FFMP015W | Field | | |
| 3102944001 | FFMP015W | Lib Search VOC | | |
| 3102944001 | FFMP015W | S2540C-11 | | |
| 3102944001 | FFMP015W | S4500HB-11 | | |
| 3102944001 | FFMP015W | SM2130B-2011 | | |
| 3102944001 | FFMP015W | SM2320B-2011 | | |
| 3102944001 | FFMP015W | SM2510B-2011 | | |
| 3102944001 | FFMP015W | SM5310B-2011 | | |
| 3102944001 | FFMP015W | SW846 6020A | SW846 3015 | |
| 3102944001 | FFMP015W | SW846 7470A | SW846 7470A | |
| 3102944001 | FFMP015W | SW846 8260B | | |
| 3102944001 | FFMP015W | SW846 9066 | 420.4/9066 | |
| 3102944002 | FFMP033W | ASTM D6919-09 | | |
| 3102944002 | FFMP033W | EPA 300.0 | | |
| 3102944002 | FFMP033W | EPA 410.4 | | |
| 3102944002 | FFMP033W | Field | | |
| 3102944002 | FFMP033W | Lib Search VOC | | |
| 3102944002 | FFMP033W | S2540C-11 | | |
| 3102944002 | FFMP033W | S4500HB-11 | | |
| 3102944002 | FFMP033W | SM2130B-2011 | | |
| 3102944002 | FFMP033W | SM2320B-2011 | | |
| 3102944002 | FFMP033W | SM2510B-2011 | | |
| 3102944002 | FFMP033W | SM5310B-2011 | | |
| 3102944002 | FFMP033W | SW846 6020A | SW846 3015 | |
| 3102944002 | FFMP033W | SW846 7470A | SW846 7470A | |
| 3102944002 | FFMP033W | SW846 8260B | | |
| 3102944002 | FFMP033W | SW846 9066 | 420.4/9066 | |
| 3102944003 | FFMP028W | ASTM D6919-09 | | |
| 3102944003 | FFMP028W | EPA 300.0 | | |
| 3102944003 | FFMP028W | EPA 410.4 | | |
| 3102944003 | FFMP028W | Field | | |
| 3102944003 | FFMP028W | Lib Search VOC | | |
| 3102944003 | FFMP028W | S2540C-11 | | |
| 3102944003 | FFMP028W | S4500HB-11 | | |
| 3102944003 | FFMP028W | SM2130B-2011 | | |
| 3102944003 | FFMP028W | SM2320B-2011 | | |
| 3102944003 | FFMP028W | SM2510B-2011 | | |
| 3102944003 | FFMP028W | SM5310B-2011 | | |
| 3102944003 | FFMP028W | SW846 6020A | SW846 3015 | |
| 3102944003 | FFMP028W | SW846 7470A | SW846 7470A | |
| 3102944003 | FFMP028W | SW846 8260B | | |
| 3102944003 | FFMP028W | SW846 9066 | 420.4/9066 | |

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301 Fulling Mill Road
Middletown, PA 17057

P: (717) 944-5541

F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSUMA Work Order #: 3102944 Initials: TS Date: 5/8/20

- | | | | |
|--|-------------|------------|-----------|
| 1. Were airbills / tracking numbers present and recorded?..... | <u>NONE</u> | YES | NO |
| Tracking number: _____ | | | |
| 2. Are Custody Seals on shipping containers intact?..... | <u>NONE</u> | YES | NO |
| 3. Are Custody Seals on sample containers intact?..... | <u>NONE</u> | YES | NO |
| 4. Is there a COC (Chain-of-Custody) present?..... | | <u>YES</u> | NO |
| 5. Are the COC and bottle labels complete, legible and in agreement?..... | | <u>YES</u> | NO |
| 5a. Does the COC contain sample locations?..... | | <u>YES</u> | NO |
| 5b. Does the COC contain date and time of sample collection for all samples?..... | | <u>YES</u> | NO |
| 5c. Does the COC contain sample collectors name?..... | | <u>YES</u> | NO |
| 5d. Does the COC note the type(s) of preservation for all bottles?..... | | <u>YES</u> | NO |
| 5e. Does the COC note the number of bottles submitted for each sample?..... | | <u>YES</u> | NO |
| 5f. Does the COC note the type of sample, composite or grab?..... | | <u>YES</u> | NO |
| 5g. Does the COC note the matrix of the sample(s)?..... | | <u>YES</u> | NO |
| 6. Are all aqueous samples requiring preservation preserved correctly? ¹ | <u>N/A</u> | <u>YES</u> | NO |
| 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?..... | | <u>YES</u> | NO |
| 8. Are all samples within holding times for the requested analyses?..... | | <u>YES</u> | NO |
| 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)..... | | <u>YES</u> | NO |
| 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?..... | <u>N/A</u> | YES | NO |
| 11. Were the samples received on ice?..... | | <u>YES</u> | NO |
| 12. Were sample temperatures measured at 0.0-6.0°C..... | | <u>YES</u> | NO |
| 13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below..... | | YES | <u>NO</u> |
| 13a. Are the samples required for SDWA compliance reporting?..... | <u>N/A</u> | YES | NO |
| 13b. Did the client provide a SDWA PWS ID#?..... | <u>N/A</u> | YES | NO |
| 13c. Are all aqueous unpreserved SDWA samples pH 5-9?..... | <u>N/A</u> | YES | NO |
| 13d. Did the client provide the SDWA sample location ID/Description?..... | <u>N/A</u> | YES | NO |
| 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?..... | <u>N/A</u> | YES | NO |

Cooler #: _____

Temperature (°C): 2 _____

Thermometer ID: 309 _____

Radiological (µCi): _____

COMMENTS (Required for all NO responses above and any sample non-conformance):

¹Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis

I.D. No 101389

Monitoring Point No. FFMP034W

Sample Date 5/18/2020

FORM 8**1. Inorganics (Enter all data in mg/l except as noted)**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|------------------------------|--------------------------|-------------------------------|
| AMMONIA-NITROGEN | 0.1 ND | ASTM D6919-03 |
| BICARBONATE ALKALINITY | 38 | SM20 2321 |
| CALCIUM, TOTAL | 41.5 | EPA 200.7 |
| CALCIUM, DISSOLVED | 41.4 | EPA 200.7 |
| COD (CHEMICAL OXYGEN DEMAND) | 15 ND | EPA 410.4 |
| CHLORIDE | 90 | EPA 300 |
| FLUORIDE | 0.2 ND | EPA 300 |
| IRON, TOTAL | 440 | EPA 200.7 |
| IRON, DISSOLVED | 270 | EPA 200.7 |
| MAGNESIUM, TOTAL | 16.3 | EPA 200.7 |
| MAGNESIUM, DISSOLVED | 15.8 | EPA 200.7 |
| MANGANESE, TOTAL | 86 | EPA 200.7 |
| MANGANESE, DISSOLVED | 99 | EPA 200.7 |
| NITRATE-NITROGEN | 7.5 | EPA 300 |
| pH-FIELD | 5.84 | FIELD |
| pH-LAB | 6.87 | EPA 150.1 |
| POTASSIUM, TOTAL | 2.3 | EPA 200.7 |
| POTASSIUM, DISSOLVED | 2.2 | EPA 200.7 |
| SODIUM, TOTAL | 29.2 | EPA 200.7 |
| SODIUM, DISSOLVED | 28.2 | EPA 200.7 |
| SPEC. COND., FIELD | 597 | FIELD |
| SPEC. COND., LAB | 561 | EPA 120.1 |
| SULFATE | 34.1 | EPA 300 |
| ALKALINITY | 38 | SM20 2320B |
| TDS (TOT. DISSOLVED SOLIDS) | 358 | SM20 2540C |
| TOC (TOTAL ORGANIC CARBON) | 1.1 | SM20 5310B |
| TOTAL PHENOLICS | 5 ND | SW846 9066 |
| TURBIDITY | 2.73 | SM 2130B |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP034W

Sample Date 5/18/2020

FORM 8**2. Metals (Enter all data in ug/l)**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-----------------------|--------------------------|-------------------------------|
| ARSENIC, TOTAL | 3.3 ND | EPA 200.8 |
| ARSENIC, DISSOLVED | 3 ND | EPA 200.8 |
| BARIUM, TOTAL | 33 | EPA 200.8 |
| BARIUM, DISSOLVED | 34 | EPA 200.8 |
| CADMIUM, TOTAL | 1.1 ND | EPA 200.8 |
| CADMIUM, DISSOLVED | 1.1 ND | EPA 200.8 |
| CHROMIUM, TOTAL | 2.2 ND | EPA 200.8 |
| CHROMIUM, DISSOLVED | 2.2 ND | EPA 200.8 |
| COPPER, TOTAL | 5.6 ND | EPA 200.8 |
| COPPER, DISSOLVED | 5.6 ND | EPA 200.8 |
| LEAD-FLAMELESS, TOTAL | 2.2 ND | EPA 200.8 |
| LEAD, DISSOLVED | 2.2 ND | EPA 200.8 |
| MERCURY, TOTAL | 0.5 ND | EPA 200.8 |
| MERCURY, DISSOLVED | 0.5 ND | EPA 200.8 |
| SELENIUM, TOTAL | 5.6 ND | EPA 200.8 |
| SELENIUM, DISSOLVED | 5.6 ND | EPA 200.8 |
| SILVER, TOTAL | 2.2 ND | EPA 200.8 |
| SILVER, DISSOLVED | 2.2 ND | EPA 200.8 |
| ZINC, TOTAL | 5.6 ND | EPA 200.8 |
| ZINC, DISSOLVED | 5.6 ND | EPA 200.8 |

T Please indicate detection limit if analyte is not detected.

I.D. No 101389

Monitoring Point No. FFMP034W

Sample Date 5/18/2020

FORM 8**3. Organics (Enter all data in ug/l)**

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|---------------------------|--------------------------|-----------------------------------|
| BENZENE | 1 ND | EPA 524.2 |
| BROMOFORM | 1 ND | EPA 524.2 |
| CARBON TETRACHLORIDE | 1 ND | EPA 524.2 |
| CHLOROBENZENE | 1 ND | EPA 524.2 |
| CHLOROETHANE | 1 ND | EPA 524.2 |
| 3-CHLORO-1-PROPENE | 1 ND | EPA 524.2 |
| DIBROMOCHLOROMETHANE | 1 ND | EPA 524.2 |
| 1,2-DIBROMOETHANE | 1 ND | EPA 524.2 |
| 1,2-DICHLOROBENZENE | 1 ND | EPA 524.2 |
| 1,3-DICHLOROBENZENE | 1 ND | EPA 524.2 |
| 1,4-DICHLOROBENZENE | 1 ND | EPA 524.2 |
| DICHLORODIFLUOROMETHANE | 1 ND | EPA 524.2 |
| 1,1-DICHLOROETHANE | 1 ND | EPA 524.2 |
| 1,1-DICHLOROETHENE | 1 ND | EPA 524.2 |
| 1,2-DICHLOROETHANE | 1 ND | EPA 524.2 |
| CIS 1,2-DICHLOROETHENE | 1 ND | EPA 524.2 |
| TRANS 1,2-DICHLOROETHENE | 1 ND | EPA 524.2 |
| 1,2-DICHLOROPROPANE | 1 ND | EPA 524.2 |
| CIS 1,3-DICHLOROPROPENE | 1 ND | EPA 524.2 |
| TRANS 1,3-DICHLOROPROPENE | 1 ND | EPA 524.2 |
| ETHYLBENZENE | 1 ND | EPA 524.2 |
| BROMOMETHANE | 1 ND | EPA 524.2 |
| CHLOROMETHANE | 1 ND | EPA 524.2 |
| METHYLENE CHLORIDE | 1 ND | EPA 524.2 |
| 2-BUTANONE (MEK) | 10 ND | EPA 524.2 |
| 1,1,1,2-TETRACHLOROETHANE | 1 ND | EPA 524.2 |
| TETRACHLOROETHENE | 1 ND | EPA 524.2 |
| 1,1,2,2-TETRACHLOROETHANE | 1 ND | EPA 524.2 |
| TOLUENE | 1 ND | EPA 524.2 |
| 1,1,1-TRICHLOROETHANE | 1 ND | EPA 524.2 |
| 1,1,2-TRICHLOROETHANE | 1 ND | EPA 524.2 |
| TRICHLOROETHENE | 1 ND | EPA 524.2 |
| TRICHLOROFLUOROMETHANE | 1 ND | EPA 524.2 |
| 1,2,3-TRICHLOROPROPANE | 2 ND | EPA 524.2 |
| VINYL CHLORIDE | 1 ND | EPA 524.2 |
| XYLENES (TOTAL) | 3 ND | EPA 524.2 |
| 4-METHYL-2-PENTANONE | 5 ND | EPA 524.2 |

T Please indicate detection limit if analyte is not detected.

I.D. No. 101389

Monitoring Point No. FFMP034W

Sample Date 5/18/2020

FORM 8
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Add-On List - For Detection Zone Analytes (mg/l). When the MCLs (where established) of any analyte is exceeded in the detection zone (e.g. established cells) Form 50 monitoring, the following analytes must be monitored during the baseline groundwater analyses .

ORGANICS AND METALS

| ANALYTE | VALUE^T | ANALYSIS METHOD NUMBER |
|-------------------------------|--------------------------|-------------------------------|
| ACETONE | 10 ND | EPA 524.2 |
| ACRYLONITRILE | 5 ND | EPA 524.2 |
| BROMOCHLOROMETHANE (CHLOROBRO | 1 ND | EPA 524.2 |
| BROMODICHLOROMETHANE | 1 ND | EPA 524.2 |
| CARBON DISULFIDE | 1 ND | EPA 524.2 |
| CHLOROFORM | 1 ND | EPA 524.2 |
| 1,2-DIBROMO-3-CHLOROPROPANE | 7 ND | EPA 524.2 |
| TRANS 1,4-DICHLORO-2-BUTENE | 3 ND | EPA 524.2 |
| 2-HEXANONE | 5 ND | EPA 524.2 |
| DIBROMOMETHANE | 1 ND | EPA 524.2 |
| IODOMETHANE | 1 ND | EPA 524.2 |
| STYRENE | 1 ND | EPA 524.2 |
| VINYL ACETATE | 5 ND | EPA 524.2 |
| ANTIMONY | 2.2 ND | EPA 200.8 |
| BERYLLIUM | 1.1 ND | EPA 200.8 |
| COBALT | 5.6 ND | SW846 6010B |
| NICKEL | 5.6 ND | SW846 6010B |
| THALLIUM | 1.1 ND | EPA 200.8 |
| VANADIUM | 2.2 ND | SW846 6010B |

^T Please indicate detection limit if analyte is not detected.

May 26, 2020

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

| | | | |
|-----------------|------------------|---------------|---------------------------------|
| Project Name: | FREY FARM | Workorder: | 3102943 |
| Purchase Order: | PO1000126 | Workorder ID: | 2ND QTR 2020 GWMP-FORM 8 |

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Monday, May 18, 2020.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

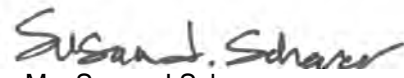
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Ashley Gichuki , Ms. Jordan Gallagher , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.


Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3102943 2ND QTR 2020 GWMP-FORM 8

| Lab ID | Sample ID | Matrix | Date Collected | Date Received | Collected By |
|------------|-----------|--------------|-----------------|-----------------|-------------------|
| 3102943001 | FFMP034W | Ground Water | 5/18/2020 13:23 | 5/18/2020 15:55 | Mr. Brian G Shade |

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SAMPLE SUMMARY

Workorder: 3102943 2ND QTR 2020 GWMP-FORM 8

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

| | |
|--------|--|
| J | Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte |
| U | Indicates that the analyte was Not Detected (ND) |
| N | Indicates presumptive evidence of the presence of a compound |
| MDL | Method Detection Limit |
| PQL | Practical Quantitation Limit |
| RDL | Reporting Detection Limit |
| ND | Not Detected - indicates that the analyte was Not Detected at the RDL |
| Cntr | Analysis was performed using this container |
| RegLmt | Regulatory Limit |
| LCS | Laboratory Control Sample |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| DUP | Sample Duplicate |
| %Rec | Percent Recovery |
| RPD | Relative Percent Difference |
| LOD | DoD Limit of Detection |
| LOQ | DoD Limit of Quantitation |
| DL | DoD Detection Limit |
| I | Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL) |
| (S) | Surrogate Compound |
| NC | Not Calculated |
| * | Result outside of QC limits |

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ANALYTICAL RESULTS

Workorder: 3102943 2ND QTR 2020 GWMP-FORM 8

Lab ID: **3102943001** Date Collected: 5/18/2020 13:23 Matrix: Ground Water
Sample ID: **FFMP034W** Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------|---------|------|-------|------|-------------|----------|----|---------------|-----|------|
| VOLATILE ORGANICS | | | | | | | | | | |
| Acetone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Acrylonitrile | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Benzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Bromochloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Bromodichloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Bromoform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Bromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 2-Butanone | ND | | ug/L | 10.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Carbon Disulfide | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Carbon Tetrachloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Chlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Chlorodibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Chloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Chloroform | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Chloromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 3-Chloro-1-propene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 1,2-Dibromo-3-chloropropane | ND | | ug/L | 7.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 1,2-Dibromoethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Dibromomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| trans-1,4-Dichloro-2-butene | ND | | ug/L | 3.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 1,2-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 1,3-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 1,4-Dichlorobenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Dichlorodifluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 1,1-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 1,2-Dichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 1,1-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| cis-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| trans-1,2-Dichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 1,2-Dichloropropane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| cis-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| trans-1,3-Dichloropropene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Ethylbenzene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 2-Hexanone | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Iodomethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 4-Methyl-2-Pentanone(MIBK) | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |

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ANALYTICAL RESULTS

Workorder: 3102943 2ND QTR 2020 GWMP-FORM 8

 Lab ID: **3102943001**

Date Collected: 5/18/2020 13:23

Matrix: Ground Water

 Sample ID: **FFMP034W**

Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|-----------------------------------|----------------|-------------|--------------|---------------|---------------|-----------------|-----------|-----------------|-----------|-------------|
| Methylene Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Styrene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 1,1,1,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 1,1,2,2-Tetrachloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Tetrachloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Toluene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Total Xylenes | ND | | ug/L | 3.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 1,1,1-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 1,1,2-Trichloroethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Trichloroethene | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Trichlorofluoromethane | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 1,2,3-Trichloropropane | ND | | ug/L | 2.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Vinyl Acetate | ND | | ug/L | 5.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Vinyl Chloride | ND | | ug/L | 1.0 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| <i>Surrogate Recoveries</i> | <i>Results</i> | <i>Flag</i> | <i>Units</i> | <i>Limits</i> | <i>Method</i> | <i>Prepared</i> | <i>By</i> | <i>Analyzed</i> | <i>By</i> | <i>Cntr</i> |
| 1,2-Dichloroethane-d4 (S) | 92.9 | | % | 62 - 133 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| 4-Bromofluorobenzene (S) | 102 | | % | 79 - 114 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Dibromofluoromethane (S) | 79.4 | | % | 78 - 116 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Toluene-d8 (S) | 94.8 | | % | 76 - 127 | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| Library Search - Volatiles | | | | | | | | | | |
| Ethanol, 2,2,2-trichloro-, | 4.3 | J N | ug/L | | SW846 8260B | | | 5/20/20 21:11 | TMP | J |
| WET CHEMISTRY | | | | | | | | | | |
| Alkalinity, Bicarbonate | 38 | | mg/L | 5 | SM2320B-2011 | | | 5/19/20 23:20 | R2B | B |
| Alkalinity, Total | 38 | 1 | mg/L | 5 | SM2320B-2011 | | | 5/19/20 23:20 | R2B | A |
| Ammonia-N | ND | | mg/L | 0.100 | ASTM D6919-09 | | | 5/24/20 03:37 | JXL | C |
| Chemical Oxygen Demand (COD) | ND | | mg/L | 15 | EPA 410.4 | | | 5/19/20 01:43 | JAM | C |
| Chloride | 90.0 | | mg/L | 2.0 | EPA 300.0 | | | 5/19/20 12:40 | MBW | B |
| Fluoride | ND | | mg/L | 0.20 | EPA 300.0 | | | 5/19/20 12:40 | MBW | B |
| Nitrate-N | 7.5 | | mg/L | 0.20 | EPA 300.0 | | | 5/19/20 12:40 | MBW | B |
| pH | 6.87 | 2,3 | pH_Units | | S4500HB-11 | | | 5/19/20 23:20 | R2B | B |
| Phenolics | ND | 4,5 | mg/L | 0.005 | SW846 9066 | 5/19/20 12:00 | VXF | 5/19/20 14:40 | C_D | I |
| Specific Conductance | 561 | | umhos/cm | 1 | SM2510B-2011 | | | 5/19/20 23:20 | R2B | B |
| Sulfate | 34.1 | | mg/L | 2.0 | EPA 300.0 | | | 5/19/20 12:40 | MBW | B |
| Total Dissolved Solids | 358 | | mg/L | 25 | S2540C-11 | | | 5/20/20 10:55 | KXH | B |
| Total Organic Carbon (TOC) | 1.1 | | mg/L | 0.50 | SM5310B-2011 | | | 5/19/20 21:59 | PAG | G |
| Turbidity | 2.73 | | NTU | 0.10 | SM2130B-2011 | | | 5/19/20 06:34 | R2B | B |

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ANALYTICAL RESULTS

Workorder: 3102943 2ND QTR 2020 GWMP-FORM 8

Lab ID: **3102943001**

Date Collected: 5/18/2020 13:23

Matrix: Ground Water

Sample ID: **FFMP034W**

Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|----------------------|---------|------|-------|---------|-------------|---------------|-----|---------------|-----|------|
| METALS | | | | | | | | | | |
| Antimony, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Arsenic, Total | ND | | mg/L | 0.0033 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Arsenic, Dissolved | ND | | mg/L | 0.0030 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| Barium, Total | 0.033 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Barium, Dissolved | 0.034 | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| Beryllium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Cadmium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Cadmium, Dissolved | ND | | mg/L | 0.0011 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| Calcium, Total | 41.5 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Calcium, Dissolved | 41.4 | | mg/L | 0.11 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| Chromium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Chromium, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| Cobalt, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Copper, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Copper, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| Iron, Total | 0.44 | | mg/L | 0.056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Iron, Dissolved | 0.27 | | mg/L | 0.056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| Lead, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Lead, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| Magnesium, Total | 16.3 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Magnesium, Dissolved | 15.8 | | mg/L | 0.11 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| Manganese, Total | 0.086 | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Manganese, Dissolved | 0.099 | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| Mercury, Total | ND | | mg/L | 0.00050 | SW846 7470A | 5/20/20 10:50 | AHI | 5/20/20 15:46 | AHI | E |
| Mercury, Dissolved | ND | | mg/L | 0.00050 | SW846 7470A | 5/20/20 10:50 | AHI | 5/20/20 16:41 | AHI | D |
| Nickel, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Potassium, Total | 2.3 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Potassium, Dissolved | 2.2 | | mg/L | 0.11 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| Selenium, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Selenium, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| Silver, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Silver, Dissolved | ND | | mg/L | 0.0022 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| Sodium, Total | 29.2 | | mg/L | 0.11 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Sodium, Dissolved | 28.2 | | mg/L | 0.11 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| Thallium, Total | ND | | mg/L | 0.0011 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Vanadium, Total | ND | | mg/L | 0.0022 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |
| Zinc, Total | ND | | mg/L | 0.0056 | SW846 6020A | 5/22/20 12:10 | AHI | 5/23/20 06:26 | MSA | E |

ALS Environmental Laboratory Locations Across North America

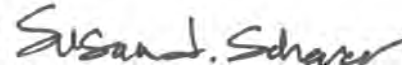
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ANALYTICAL RESULTS

Workorder: 3102943 2ND QTR 2020 GWMP-FORM 8

Lab ID: **3102943001** Date Collected: 5/18/2020 13:23 Matrix: Ground Water
 Sample ID: **FFMP034W** Date Received: 5/18/2020 15:55

| Parameters | Results | Flag | Units | RDL | Method | Prepared | By | Analyzed | By | Cntr |
|------------------------------|---------|------|----------|--------|-------------|---------------|-----|---------------|-----|------|
| Zinc, Dissolved | ND | | mg/L | 0.0056 | SW846 6020A | 5/19/20 19:55 | SXC | 5/20/20 02:43 | MSA | D1 |
| FIELD PARAMETERS | | | | | | | | | | |
| Depth to Water Level | 9.50 | | Feet | | Field | | | 5/18/20 13:23 | BGS | F |
| Elev Top MW Casing above MSL | 472.88 | | Feet | | Field | | | 5/18/20 13:23 | BGS | F |
| Flow Rate | 1.39 | | gal/min | | Field | | | 5/18/20 13:23 | BGS | F |
| Ground Water Elevation | 463.38 | | ft/MSL | | Field | | | 5/18/20 13:23 | BGS | F |
| pH, Field (SM4500B) | 5.84 | | pH_Units | | Field | | | 5/18/20 13:23 | BGS | F |
| Sample Depth | 25.85 | | Feet | | Field | | | 5/18/20 13:23 | BGS | F |
| Specific Conductance, Field | 597 | | umhos/cm | 1 | Field | | | 5/18/20 13:23 | BGS | F |
| Temperature | 9.82 | | Deg. C | | Field | | | 5/18/20 13:23 | BGS | F |
| Total Well Depth | 121.00 | | Feet | | Field | | | 5/18/20 13:23 | BGS | F |
| Volume in Water Column | 163.91 | | Gallons | | Field | | | 5/18/20 13:23 | BGS | F |
| Water Level After Purge | 15.89 | | Feet | | Field | | | 5/18/20 13:23 | BGS | F |
| Well Volumes Purged | 0.76 | | Vol | | Field | | | 5/18/20 13:23 | BGS | F |



Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3102943 2ND QTR 2020 GWMP-FORM 8

PARAMETER QUALIFIERS

| Lab ID | # | Sample ID | Analytical Method | Analyte |
|---|---|-----------|-------------------|-------------------|
| 3102943001 | 1 | FFMP034W | SM2320B-2011 | Alkalinity, Total |
| The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L. | | | | |
| 3102943001 | 2 | FFMP034W | S4500HB-11 | pH |
| The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory. | | | | |
| 3102943001 | 3 | FFMP034W | S4500HB-11 | pH |
| The QC sample type DUP for method SM4500H+B was outside the control limits for the analyte pH. The Recovery was reported as 0.119 and the control limits were 0.100 pH units. | | | | |
| 3102943001 | 4 | FFMP034W | SW846 9066 | Phenolics |
| The QC sample type MS for method 420.4/9066 was outside the control limits for the analyte Phenolics. The % Recovery was reported as 84.5 and the control limits were 90 to 110. | | | | |
| 3102943001 | 5 | FFMP034W | SW846 9066 | Phenolics |
| The QC sample type MSD for method 420.4/9066 was outside the control limits for the analyte Phenolics. The % Recovery was reported as 84.6 and the control limits were 90 to 110. | | | | |

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3102943 2ND QTR 2020 GWMP-FORM 8

| Lab ID | Sample ID | Analysis Method | Prep Method | Leachate Method |
|------------|-----------|-----------------|-------------|-----------------|
| 3102943001 | FFMP034W | ASTM D6919-09 | | |
| 3102943001 | FFMP034W | EPA 300.0 | | |
| 3102943001 | FFMP034W | EPA 410.4 | | |
| 3102943001 | FFMP034W | Field | | |
| 3102943001 | FFMP034W | Lib Search VOC | | |
| 3102943001 | FFMP034W | S2540C-11 | | |
| 3102943001 | FFMP034W | S4500HB-11 | | |
| 3102943001 | FFMP034W | SM2130B-2011 | | |
| 3102943001 | FFMP034W | SM2320B-2011 | | |
| 3102943001 | FFMP034W | SM2510B-2011 | | |
| 3102943001 | FFMP034W | SM5310B-2011 | | |
| 3102943001 | FFMP034W | SW846 6020A | SW846 3015 | |
| 3102943001 | FFMP034W | SW846 7470A | SW846 7470A | |
| 3102943001 | FFMP034W | SW846 8260B | | |
| 3102943001 | FFMP034W | SW846 9066 | 420.4/9066 | |

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**CHAIN OF CUSTODY/
REQUEST FOR ANALYSIS**
ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT/
SAMPLER, INSTRUCTIONS ON THE BACK.

Generated by ALS

1 of 1



301 Folling Mill Road • Middletown, PA 17057 • Tel: 717.944.5541 • Fax: 717.944.1430

Client Name: Lancaster County Solid Waste MA
Address: 1299 Harrisburg Pike, P.O. Box 4424
Lancaster, PA 17604

Contact: Dan Brown
Phone#: (717) 735-0193
Project Name#: FORM 8/FFMP033W
Bill To: Lancaster County Solid Waste MA

TAT Normal-Standard TAT is 10-12 business days.
 Rush-Subject to ALS approval and surcharges.
Date Required: _____ Approved By: _____
Email? Y N dbrown@LCSWMA.com
Fax? Y N No: (717) 397-9973

| Container Type | AG | AN | CG | PL | PL | PL | PL | PL |
|----------------|--------|-------|--------|--------|--------|------|--------|----|
| 40 ml | 125 ml | 40 ml | 250 ml | 125 ml | 125 ml | 1L | 500 ml | |
| HCl | H2SO4 | HCl | H2SO4 | HNO3 | HNO3 | None | None | |

Cooler Temp: 2 Therm ID: 309
No. of Coolers: Y N Initial

Custody Seals Present? (if present) Seals Intact? Received on Ice? COC/Labels Complete/Accurate? Cont. in Good Cond.? Correct Containers? Correct Sample Volumes? Correct Preservation? Headspace/Volatiles?

Courier/Tracking #: _____ Sample/COC Comments

| Container Type | AG | AN | CG | PL | PL | PL | PL | PL |
|----------------|--------|-------|--------|--------|--------|------|--------|----|
| 40 ml | 125 ml | 40 ml | 250 ml | 125 ml | 125 ml | 1L | 500 ml | |
| HCl | H2SO4 | HCl | H2SO4 | HNO3 | HNO3 | None | None | |

Field Measurements: NH3-N, COD, Sample Depth for AUX Data, Dissolved Metals Form 8 (Field Filtered), Total Metals, with Subtitle D, PH, Cl, SPC, F, SO4, TDS, NO3, Turb, Alkalinity Bicarbonate

Enter Number of Containers Per Sample or Field Results Below.

| Sample Description/Location (as it will appear on the lab report) | Sample Date | Time |
|---|-------------|------|
| 1. FFMP034W | 05/18/20 | 1323 |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |

| Project Comments: | LOGGED BY (signature): | REVIEWED BY (signature): | Date | Time | Received By / Company Name |
|-----------------------------------|------------------------|--------------------------|---------|------|----------------------------|
| 1. Relinquished By / Company Name | | | 5/18/20 | 1555 | 5/18/20 1555 |
| 3 | | | | | |
| 5 | | | | | |
| 7 | | | | | |
| 9 | | | | | |

ALS Field Services: Pickup Labor
 Composite_Sampling Rental_Equipment
 Other:

Special Processing: USACE Navy
 State Samples Collected In: NY NJ PA NC

Reportable to PADEP? Yes No
 PWSID # _____

Sample Disposal: Lab Special

EDDS: Format Type: _____

* G=Grab; C=Composite **Matrix - Al=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

Rev 8/04



301 Fulling Mill Road
Middletown, PA 17057

P: (717) 944-5541

F: (717) 944-1430

Condition of Sample Receipt Form

Client: LC SW/MA Work Order #: 3102943 Initials: TS Date: 5/18/20

- | | | | |
|--|-------------|------------|-----------|
| 1. Were airbills / tracking numbers present and recorded?..... | <u>NONE</u> | YES | NO |
| Tracking number: _____ | | | |
| 2. Are Custody Seals on shipping containers intact?..... | <u>NONE</u> | YES | NO |
| 3. Are Custody Seals on sample containers intact?..... | <u>NONE</u> | YES | NO |
| 4. Is there a COC (Chain-of-Custody) present?..... | | <u>YES</u> | NO |
| 5. Are the COC and bottle labels complete, legible and in agreement?..... | | <u>YES</u> | NO |
| 5a. Does the COC contain sample locations?..... | | <u>YES</u> | NO |
| 5b. Does the COC contain date and time of sample collection for all samples?..... | | <u>YES</u> | NO |
| 5c. Does the COC contain sample collectors name?..... | | <u>YES</u> | NO |
| 5d. Does the COC note the type(s) of preservation for all bottles?..... | | <u>YES</u> | NO |
| 5e. Does the COC note the number of bottles submitted for each sample?..... | | <u>YES</u> | NO |
| 5f. Does the COC note the type of sample, composite or grab?..... | | <u>YES</u> | NO |
| 5g. Does the COC note the matrix of the sample(s)?..... | | <u>YES</u> | NO |
| 6. Are all aqueous samples requiring preservation preserved correctly? ¹ | N/A | <u>YES</u> | NO |
| 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?..... | | <u>YES</u> | NO |
| 8. Are all samples within holding times for the requested analyses?..... | | <u>YES</u> | NO |
| 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)..... | | <u>YES</u> | NO |
| 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?..... | <u>N/A</u> | YES | NO |
| 11. Were the samples received on ice?..... | | <u>YES</u> | NO |
| 12. Were sample temperatures measured at 0.0-6.0°C..... | | <u>YES</u> | NO |
| 13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below..... | | YES | <u>NO</u> |
| 13a. Are the samples required for SDWA compliance reporting?..... | N/A | YES | NO |
| 13b. Did the client provide a SDWA PWS ID#?..... | N/A | YES | NO |
| 13c. Are all aqueous unpreserved SDWA samples pH 5-9?..... | N/A | YES | NO |
| 13d. Did the client provide the SDWA sample location ID/Description?..... | N/A | YES | NO |
| 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?..... | N/A | YES | NO |

Cooler #: _____

Temperature (°C): 2 _____

Thermometer ID: 309 _____

Radiological (µCi): _____

COMMENTS (Required for all NO responses above and any sample non-conformance):

¹Final determination of correct preservation for analysis such as volatiles, microbiology, and oil and grease is made in the analytical department at the time of or following the analysis