LCSWMA

1299 HARRISBURG PIKE | PO BOX 4425 | LANCASTER, PA 17604
PHONE: 717-397-9968 | FAX: 717-397-9973
www.lcswma.org

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.

LCSWMA

1299 HARRISBURG PIKE | PO BOX 4425 | LANCASTER, PA 17604
PHONE: 717-397-9968 | FAX: 717-397-9973
www.lcswma.org

- 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
Quarterly Analytes																					
AMMONIA-NITROGEN	**0.31**	mg/L	< 0.10	< 0.10	< 0.10	< 0.10	0.31	< 0.10	< 0.10	0.11	< 0.10	< 0.10	< 0.10	< 0.10	0.16	0.61	0.69	< 0.10	< 0.10	< 0.10	0.10
BICARBONATE	**135**	mg/L	< 5	52	20	33	79	25	63	31	27	6	113	17	67	64	42	17	192	54	26
CALCIUM, TOTAL	**72.8**	mg/L	18.4	74.7	21.7	31.5	95.2	29.2	55.4	22.5	36.5	7.6	104	17.4	37.9	13.3	25.3	17.7	136	64.4	19.6
CALCIUM, DISSOLVED	**79.4**	mg/L	18.4	75.5	22.3	31.4	103	29.7	54.8	21.3	37.2	8.2	102	17.3	37.2	13.1	24.5	17.4	142	65.6	19.9
COD (CHEMICAL OXYGEN DEMAND)	**15***	mg/L	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15
CHLORIDE	**30.8**	mg/L	20.6	209	31.2	76.7	355	99.3	86.9	53.5	84.7	40	318	66.4	24.2	20.4	40.4	28.7	301	164	112
FLUORIDE	**0.50**	mg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
IRON, TOTAL	**0.73**	mg/L	< 0.056	< 0.056	< 0.056	0.060	< 0.056	0.060	< 0.056	< 0.056	< 0.056	< 0.056	0.68	1.1	3.5	10.6	5.5	< 0.056	0.060	< 0.056	< 0.056
IRON, DISSOLVED	**0.056***	mg/L	< 0.056	< 0.056	< 0.056	< 0.056	< 0.056	< 0.056	< 0.056	< 0.056	< 0.056	< 0.056	0.06	< 0.056	3.3	4.9	5.3	< 0.056	< 0.056	< 0.056	< 0.056
MAGNESIUM, TOTAL	**10.3**	mg/L	7.6	20	24.9	15.3	42.2	14.5	5.6	12.9	16.7	6.3	17.6	7.1	3.9	5.2	9.0	12.7	25.1	15.8	12.6
MAGNESIUM, DISSOLVED	**10.9**	mg/L	7.3	20.6	24.4	14.9	42.9	15.3	5.6	12.5	17.1	6.6	17.4	7.1	3.8	5.1	8.8	13.3	25.4	16.9	12.9
MANGANESE, TOTAL	**0.48**	mg/L	0.21	0.11	0.03	0.01	2.5	0.21	< 0.0056	0.0094	0.0073	0.020	0.42	0.020	0.30	0.50	0.41	0.29	0.31	0.73	0.92
MANGANESE, DISSOLVED	**0.53**	mg/L	0.21	0.11	0.03	0.01	2.6	0.23	< 0.0056	< 0.0056	0.010	0.030	0.43	0.010	0.29	0.49	0.39	0.28	0.33	0.75	0.95
NITRATE-NITROGEN	**28.6**	mg/L	19.8	2.1	35.9	9.1	1.5	4.8	0.26	5.9	16.3	3.1	8.5	15.2	< 0.20	< 0.20	10.8	22.0	0.28	1.2	4.1
pH-FIELD	**None****	S.U.	4.61	5.38	5.43	5.85	5.89	5.34	6.53	5.61	5.48	5.15	7.81	5.34	7.31	6.94	5.80	5.03	6.90	5.47	5.21
pH-LAB	**None****	S.U.	5.23	6.02	6.33	6.29	6.73	6.09	7.30	6.42	6.52	5.94	7.65	5.89	7.81	7.18	6.77	5.49	7.59	5.87	6.03
POTASSIUM, TOTAL	**13.60**	mg/L	1.0	3.3	2.5	2.3	7.3	4.5	0.84	2.3	2.1	1.6	1.7	4.4	1.2	1.3	1.5	1.3	2.2	8.4	2.6
POTASSIUM, DISSOLVED	**11.4**	mg/L	1.0	3.3	2.5	2.3	7.5	4.7	0.84	2.4	2.1	1.7	1.7	4.4	1.2	1.3	1.5	1.3	2.2	8.9	2.7
SODIUM, TOTAL	**26.6**	mg/L	13.3	54.4	26.0	26.8	96.7	31.1	9.9	20.7	26.6	15.0	107	52.1	10.4	12.5	13.6	11.8	82.7	54.9	50.6
SODIUM, DISSOLVED	**21.6**	mg/L	13.0	54.8	24.9	26.9	96.6	33.2	10	19.6	27.2	15.9	105	52.6	10.3	12.7	13.3	12.1	84.3	55.3	50.1
SPEC. COND., FIELD	**640**	µmhos/cm	293	965	556	510	1,523	528	463	374	575	210	17	505	311	209	384	320	1,465	862	536
SPEC. COND., LAB	**750**	µmhos/cm	263	904	503	496	1,500	497	428	375	545	195	1,340	476	294	191	334	294	1,430	817	515
SULFATE	**71**	mg/L	9.3	81.2	24.6	31.8	72.9	40.8	15.8	26.2	24.3	2.5	30.9	30.3	43.4	< 2.0	6.2	3.4	46.8	103	15.4
ALKALINITY	**142**	mg/L	< 5	52	20	33	79	25	63	31	27	6	113	17	67	64	42	17	192	54	26
TDS (TOTAL DISSOLVED SOLIDS)	**389**	mg/L	172	556	344	284	1,140	296	392	182	378	150	882	282	198	116	220	184	918	438	338
TOC (TOTAL ORGANIC CARBON)	**1.34**	mg/L	0.5	1.5	1.2	0.82	2.9	0.5	0.65	1.1	1.3	0.5	0.61	3.2	0.5	0.5	0.68	0.5	0.84	1.9	0.87
TOTAL PHENOLICS	**0.005***	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
TURBIDITY	**4.71**	NTU	0.12	0.18	0.10	< 0.10	0.44	0.23	0.11	0.11	0.16	0.17	7.49	15.4	14.6	139	6.09	< 0.10	0.54	0.45	1.02
BENZENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-DIBROMOETHANE (EDB)	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1-DICHLOROETHANE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1-DICHLOROETHENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-DICHLOROETHANE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
cis 1,2-DICHLOROETHENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
trans 1,2-DICHLOROETHENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
ETHYLBENZENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
METHYLENE CHLORIDE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
TETRACHLOROETHENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
TOLUENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1-TRICHLOROETHANE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
TRICHLOROETHENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
VINYL CHLORIDE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
XYLENES (TOTAL)	**3***	µg/L	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3

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 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
Annual Analytes																					
ARSENIC, TOTAL	**0.0033***	mg/L	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033
ARSENIC, DISSOLVED	**0.0030***	mg/L	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030
BARIUM, TOTAL	**0.088**	mg/L	0.06	0.05	0.08	0.06	0.13	0.06	0.08	0.04	0.06	0.04	0.15	0.08	0.02	< 0.0056	0.04	0.04	0.19	0.09	0.05
BARIUM, DISSOLVED	**0.088**	mg/L	0.06	0.05	0.08	0.06	0.14	0.06	0.07	0.05	0.06	0.04	0.15	0.08	0.02	< 0.0056	0.04	0.04	0.19	0.09	0.06
CADMIUM, TOTAL	**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
CADMIUM, DISSOLVED	**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
CHROMIUM, TOTAL	**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	0.01	< 0.0022	< 0.0022	< 0.0022	< 0.0022	0.0025	< 0.0022	0.0023
CHROMIUM, DISSOLVED	**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
COPPER, TOTAL	**0.030**	mg/L	0.010	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	0.010	< 0.0056	< 0.0056	< 0.0056	0.0065	< 0.0056	< 0.0056	< 0.0056
COPPER, DISSOLVED	**0.030**	mg/L	0.010	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	0.0077	< 0.0056	< 0.0056	< 0.0056	0.0063	< 0.0056	< 0.0056	< 0.0056
LEAD-FLAMELESS, TOTAL	**0.014**	mg/L	0.0064	< 0.0022	< 0.0022	< 0.0022	< 0.0022	< 0.0022	0.0023	< 0.0022	< 0.0022	< 0.0022	< 0.0022	< 0.0022	< 0.0022	< 0.0022	< 0.0022	< 0.0022	< 0.0022	< 0.0022	< 0.0022
LEAD, DISSOLVED	**0.010**	mg/L	0.0063	< 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
MERCURY, TOTAL	**0.00050***	mg/L	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	0.00052
MERCURY, DISSOLVED	**0.00050***	mg/L	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
SELENIUM, TOTAL	**0.0056***	mg/L	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056
SELENIUM, DISSOLVED	**0.0056***	mg/L	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056	< 0.0056
SILVER, TOTAL	**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
SILVER, DISSOLVED	**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
ZINC, TOTAL	**0.098**	mg/L	0.02	0.0077	0.03	0.007	0.01	0.01	< 0.0056	0.0069	0.01	0.0065	< 0.0056	0.01	< 0.0056	< 0.0056	< 0.0056	0.01	< 0.0056	0.01	0.0079
ZINC, DISSOLVED	**0.088**	mg/L	0.02	< 0.0056	0.03	0.01	0.0093	0.01	< 0.0056	0.0079	0.01	< 0.0056	< 0.0056	0.01	< 0.0056	< 0.0056	< 0.0056	0.01	< 0.0056	0.01	0.0083
BROMOFORM	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
BROMOMETHANE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
CARBON TETRACHLORIDE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
CHLOROBENZENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
CHLOROETHANE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
DIBROMOCHLOROMETHANE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
CHLOROMETHANE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
3-CHLORO-1-PROPENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-DICHLOROBENZENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,3-DICHLOROBENZENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,4-DICHLOROBENZENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
DICHLORODIFLUOROMETHANE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-DICHLOROPROPANE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
cis 1,3-DICHLOROPROPENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
trans 1,3-DICHLOROPROPENE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2-BUTANONE (MEK)	**10***	µg/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-METHYL-2-PENTANONE (MIBK)	**5***	µg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,1,2-TETRACHLOROETHANE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-TETRACHLOROETHANE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-TRICHLOROETHANE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
TRICHLOROFLUOROMETHANE	**1***	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-TRICHLOROPROPANE	**2***	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

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 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
Subtitle D Analytes																					
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)			
Form 19 Quarterly Parameters			
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)			
Form 19 Annual Parameters			
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
CHLOROBENZENE	NA	1*	µg/L
CHLOROETHANE	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)			
Form 19 Subtitle D Parameters			
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

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			

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**						

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

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

201					nu hat (MLE)	16.6				nu star (bias corrected)		16.85
202					MLE Mean (bias corrected)	15.94				MLE Sd (bias corrected)		37.25
203					95% Percentile of Chisquare (2kstar)	1.93				90% Percentile		48.11
204					95% Percentile	83.98				99% Percentile		184.2
205	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
206	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
207					WH	HW					WH	HW
208				95% Approx. Gamma UTL with 95% Coverage	92.75	107.4				95% Approx. Gamma UPL	61.21	64.2
209				95% Gamma USL	197.4	276.9						
210												
211	**Estimates of Gamma Parameters using KM Estimates**											
212					Mean (KM)	18.76				SD (KM)		36.47
213					Variance (KM)	1330				SE of Mean (KM)		5.517
214					k hat (KM)	0.265				k star (KM)		0.262
215					nu hat (KM)	24.35				nu star (KM)		24.09
216					theta hat (KM)	70.89				theta star (KM)		71.64
217					80% gamma percentile (KM)	27.68				90% gamma percentile (KM)		56.11
218					95% gamma percentile (KM)	89.55				99% gamma percentile (KM)		178
219												
220	**The following statistics are computed using gamma distribution and KM estimates**											
221	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
222					WH	HW					WH	HW
223				95% Approx. Gamma UTL with 95% Coverage	74.93	72.83				95% Approx. Gamma UPL	56.73	53.92
224				95% KM Gamma Percentile	54.47	51.63				95% Gamma USL	128.2	132
225												
226	**Lognormal GOF Test on Detected Observations Only**											
227					Shapiro Wilk Test Statistic	0.864	**Shapiro Wilk GOF Test**					
228					5% Shapiro Wilk Critical Value	0.905	Data Not Lognormal at 5% Significance Level					
229					Lilliefors Test Statistic	0.212	**Lilliefors GOF Test**					
230					5% Lilliefors Critical Value	0.192	Data Not Lognormal at 5% Significance Level					
231	**Data Not Lognormal at 5% Significance Level**											
232												
233	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
234					Mean in Original Scale	16.39				Mean in Log Scale		0.735
235					SD in Original Scale	37.83				SD in Log Scale		2.266
236					95% UTL95% Coverage	232				95% BCA UTL95% Coverage		161.5
237					95% Bootstrap (%) UTL95% Coverage	175				95% UPL (t)		97.67
238					90% Percentile (z)	38.05				95% Percentile (z)		86.67
239					99% Percentile (z)	406				95% USL		1573
240												
241	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
242					KM Mean of Logged Data	2.137				95% KM UTL (Lognormal)95% Coverage		67.65
243					KM SD of Logged Data	0.999				95% KM UPL (Lognormal)		46.2
244					95% KM Percentile Lognormal (z)	43.83				95% KM USL (Lognormal)		157.3
245												
246	**Background DL/2 Statistics Assuming Lognormal Distribution**											
247					Mean in Original Scale	17.35				Mean in Log Scale		1.745
248					SD in Original Scale	37.43				SD in Log Scale		1.25
249					95% UTL95% Coverage	77.11				95% UPL (t)		47.84
250					90% Percentile (z)	28.44				95% Percentile (z)		44.79

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 with95% 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	

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	

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												

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

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

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% UTL95% 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
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	0.115			
708				Maximum	1.8			Median	0.01			
709				SD	0.297			CV	2.588			
710				k hat (MLE)	0.455			k star (bias corrected MLE)	0.439			
711				Theta hat (MLE)	0.252			Theta star (bias corrected MLE)	0.261			
712				nu hat (MLE)	41.82			nu star (bias corrected)	40.42			
713				MLE Mean (bias corrected)	0.115			MLE Sd (bias corrected)	0.173			
714				95% Percentile of Chisquare (2kstar)	3.534			90% Percentile	0.318			
715				95% Percentile	0.461			99% Percentile	0.816			
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)	0.284			
724				Variance (KM)	0.0809			SE of Mean (KM)	0.0433			
725				k hat (KM)	0.244			k star (KM)	0.243			
726				nu hat (KM)	22.49			nu star (KM)	22.36			
727				theta hat (KM)	0.575			theta star (KM)	0.579			
728				80% gamma percentile (KM)	0.202			90% gamma percentile (KM)	0.423			
729				95% gamma percentile (KM)	0.687			99% gamma percentile (KM)	1.391			
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	-3.552			
746				SD in Original Scale	0.295			SD in Log Scale	1.733			
747				95% UTL95% Coverage	1.053			95% BCA UTL95% Coverage	1.438			
748				95% Bootstrap (%) UTL95% Coverage	1.443			95% UPL (t)	0.543			
749				90% Percentile (z)	0.264			95% Percentile (z)	0.496			
750				99% Percentile (z)	1.616			95% USL	4.553			

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**		

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**											

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					0
960	Number of Distinct Observations					20						
961	Number of Detects					44	Number of Non-Detects					2
962	Number of Distinct Detects					18	Number of Distinct Non-Detects					2
963	Minimum Detect					0.04	Minimum Non-Detect					0.0056
964	Maximum Detect					0.58	Maximum Non-Detect					0.1
965	Variance Detected					0.00771	Percent Non-Detects					4.348%
966	Mean Detected					0.271	SD Detected					0.0878
967	Mean of Detected Logged Data					-1.367	SD of Detected Logged Data					0.404
968												
969	**Critical Values for Background Threshold Values (BTVs)**											
970	Tolerance Factor K (For UTL)					2.079	d2max (for USL)					2.924
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					0.0998
981	95% UTL95% Coverage					0.468	95% KM UPL (t)					0.43
982	90% KM Percentile (z)					0.388	95% KM Percentile (z)					0.424
983	99% KM Percentile (z)					0.492	95% KM USL					0.552
984												
985	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
986	Mean					0.261	SD					0.0997
987	95% UTL95% Coverage					0.468	95% UPL (t)					0.43
988	90% Percentile (z)					0.389	95% Percentile (z)					0.425
989	99% Percentile (z)					0.493	95% USL					0.552
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)					7.586

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

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**											

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

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

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**							

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			

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	

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												

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

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**											

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

1701					95% USL	20.9						
1702												
1703	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1704	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1705	and consists of observations collected from clean unimpacted locations.											
1706	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1707	represents a background data set and when many onsite observations need to be compared with the BTV.											
1708												
1709	**SPEC. COND., FIELD**											
1710												
1711	**General Statistics**											
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	**Critical Values for Background Threshold Values (BTVs)**											
1722					Tolerance Factor K (For UTL)	2.085			d2max (for USL)	2.915		
1723												
1724	**Normal GOF Test**											
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	**Data Not Normal at 5% Significance Level**											
1730												
1731	**Background Statistics Assuming Normal Distribution**											
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	**Gamma GOF Test**											
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	**Data Not Gamma Distributed at 5% Significance Level**											
1742												
1743	**Gamma Statistics**											
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	**Background Statistics Assuming Gamma Distribution**											
1750					95% Wilson Hilferty (WH) Approx. Gamma UPL	609			90% Percentile	541.7		

1751	95% Hawkins Wixley (HW) Approx. Gamma UPL					649.5					95% Percentile	621.4
1752	95% WH Approx. Gamma UTL with 95% Coverage					692.3					99% Percentile	790.1
1753	95% HW Approx. Gamma UTL with 95% Coverage					751.6						
1754					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	1224					90% Percentile (z)	716.3
1765					95% UPL (t)	945.9					95% Percentile (z)	912.5
1766					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	44					95% UTL with 95% Coverage	661
1773					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					665.2					95% BCA Bootstrap UTL with 95% Coverage	661
1776					95% UPL	639.7					90% Percentile	377
1777					90% Chebyshev UPL	657.1					95% Percentile	565.2
1778					95% Chebyshev UPL	802.2					99% Percentile	673.9
1779					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	45					Number of Distinct Observations	37
1791											Number of Missing Observations	1
1792					Minimum	242					First Quartile	277
1793					Second Largest	790					Median	302
1794					Maximum	1020					Third Quartile	338
1795					Mean	346.8					SD	146.9
1796					Coefficient of Variation	0.424					Skewness	3.204
1797					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)	2.085					d2max (for USL)	2.915

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	

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

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

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

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**		

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												

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**											

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

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

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

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

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

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												

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

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

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

	Maximum Detect	N/A
	Variance Detected	N/A
	Mean Detected	N/A
	Mean of Detected Logged Data	N/A

	Maximum Non-Detect	0.002
	Percent Non-Detects	100%
	SD Detected	N/A
	SD of Detected Logged Data	N/A

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable CADMIUM, DISSOLVED was not processed!

CHROMIUM, TOTAL

General Statistics

Total Number of Observations	12	Number of Missing Observations	34
Number of Distinct Observations	5		
Number of Detects	2	Number of Non-Detects	10
Number of Distinct Detects	2	Number of Distinct Non-Detects	3
Minimum Detect	0.0066	Minimum Non-Detect	0.0022
Maximum Detect	0.0076	Maximum Non-Detect	0.006
Variance Detected	5.0000E-7	Percent Non-Detects	83.33%
Mean Detected	0.0071	SD Detected	7.0711E-4
Mean of Detected Logged Data	-4.95	SD of Detected Logged Data	0.0998

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.736	d2max (for USL)	2.285

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.00302	KM SD	0.00184
95% UTL95% Coverage	0.00804	95% KM UPL (t)	0.00645
90% KM Percentile (z)	0.00537	95% KM Percentile (z)	0.00604
99% KM Percentile (z)	0.00729	95% KM USL	0.00722

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.00298	SD	0.0021
95% UTL95% Coverage	0.00874	95% UPL (t)	0.00692
90% Percentile (z)	0.00568	95% Percentile (z)	0.00644
99% Percentile (z)	0.00788	95% USL	0.00779

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

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												

3051	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
3052					Order of Statistic, r	12				95% UTL with95% 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
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

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**					

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**					

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

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

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

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 with95% 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% UTL95% 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% UTL95% 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**											

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**											

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

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

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		8.333%
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

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						

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	**CHLOROBENZENE**											
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!**											

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					

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						

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!**											

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	25.77
4335				95% KM Gamma Percentile	26.19	24.95				95% Gamma USL	41.74	39.95
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

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						

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!**											

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						

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.							

	A	B	C	D	E	F	G	H	I	J	K	L
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

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	

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
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

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).**											

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	

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).**											

	A	B	C	D	E	F	G	H	I	J	K	L
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

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

5101					95% UPL	0.14				90% Percentile		0.068
5102					90% Chebyshev UPL	0.161				95% Percentile		0.104
5103					95% Chebyshev UPL	0.216				99% Percentile		0.133
5104					95% USL	0.14						
5105												
5106	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
5107	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
5108	and consists of observations collected from clean unimpacted locations.											
5109	The use of USL tends to provide a balance between false positives and false negatives provided the data											
5110	represents a background data set and when many onsite observations need to be compared with the BTV.											
5111												
5112	**THALLIUM**											
5113												
5114	**General Statistics**											
5115					Total Number of Observations	10				Number of Missing Observations		36
5116					Number of Distinct Observations	2						
5117					Number of Detects	0				Number of Non-Detects		10
5118					Number of Distinct Detects	0				Number of Distinct Non-Detects		2
5119					Minimum Detect	N/A				Minimum Non-Detect		0.0011
5120					Maximum Detect	N/A				Maximum Non-Detect		0.02
5121					Variance Detected	N/A				Percent Non-Detects		100%
5122					Mean Detected	N/A				SD Detected		N/A
5123					Mean of Detected Logged Data	N/A				SD of Detected Logged Data		N/A
5124												
5125	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
5126	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
5127	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
5128												
5129	**The data set for variable THALLIUM was not processed!**											
5130												
5131												
5132	**VANADIUM**											
5133												
5134	**General Statistics**											
5135					Total Number of Observations	10				Number of Missing Observations		36
5136					Number of Distinct Observations	3						
5137					Number of Detects	0				Number of Non-Detects		10
5138					Number of Distinct Detects	0				Number of Distinct Non-Detects		3
5139					Minimum Detect	N/A				Minimum Non-Detect		0.0022
5140					Maximum Detect	N/A				Maximum Non-Detect		0.006
5141					Variance Detected	N/A				Percent Non-Detects		100%
5142					Mean Detected	N/A				SD Detected		N/A
5143					Mean of Detected Logged Data	N/A				SD of Detected Logged Data		N/A
5144												
5145	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
5146	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
5147	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
5148												
5149	**The data set for variable VANADIUM was not processed!**											
5150												

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/18/2020
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, 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: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DE° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: LCSWMA

Address: 3044 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39° 57 ' 30.58 " Longitude: 76° 26 ' 11.25 "

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

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

Sample Date:(mm/dd/yy) 05/22/2020 Sample Collection Time: 9:32 AM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 06/03/2020

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

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 05/22/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	8	SM20-2321
CALCIUM, TOTAL	13.6	EPA 200.7
CALCIUM, DISSOLVED	14.9	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	21	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	10.3	EPA 200.7
MAGNESIUM, DISSOLVED	11.4	EPA 200.7
MANGANESE, TOTAL (ug/l)	27	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	29	EPA 200.7
NITRATE-NITROGEN	18.1	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 05/22/2020

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	5.78	FIELD
pH-LAB (SU)	5.72	SM4500B
POTASSIUM, TOTAL	1.7	EPA 200.7
POTASSIUM, DISSOLVED	1.5	EPA 200.7
SODIUM, TOTAL	8.5	EPA 200.7
SODIUM, DISSOLVED	8.5	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	241	FIELD
SPEC. COND., LAB (umhos/cm)	238	EPA 120.1
SULFATE	2 ND	EPA 300
ALKALINITY	8	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	134	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.1 ND	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 05/22/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		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
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/18/2020
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, 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: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DE° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: MILLER

Address: 3052 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39° 57' 29.85" Longitude: 76° 26' 11.45"

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

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

Sample Date:(mm/dd/yy) 05/22/2020 Sample Collection Time: 9:52 AM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 06/03/2020

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

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS MILLER

Sample Date: 05/22/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	10	SM20-2321
CALCIUM, TOTAL	15	EPA 200.7
CALCIUM, DISSOLVED	16.5	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	20.8	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	9	EPA 200.7
MAGNESIUM, DISSOLVED	10	EPA 200.7
MANGANESE, TOTAL (ug/l)	47	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	50	EPA 200.7
NITRATE-NITROGEN	17.3	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS MILLER

Sample Date: 05/22/2020

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	5.69	FIELD
pH-LAB (SU)	5.66	SM4500B
POTASSIUM, TOTAL	2	EPA 200.7
POTASSIUM, DISSOLVED	1.9	EPA 200.7
SODIUM, TOTAL	7.4	EPA 200.7
SODIUM, DISSOLVED	7.5	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	228	FIELD
SPEC. COND., LAB (umhos/cm)	232	EPA 120.1
SULFATE	2.3	EPA 300
ALKALINITY	10	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	146	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	1.1	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS MILLER

Sample Date: 05/22/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		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
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/18/2020
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, 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: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DE° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: LCSWMA

Address: 3056 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39° 57' 28.44" Longitude: 76° 26' 10.43"

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

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

Sample Date:(mm/dd/yy) 05/22/2020 Sample Collection Time: 12:19 PM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 06/03/2020

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

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 05/22/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	5 ND	SM20-2321
CALCIUM, TOTAL	11.7	EPA 200.7
CALCIUM, DISSOLVED	12.5	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	25.1	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	13	EPA 200.7
MAGNESIUM, DISSOLVED	14	EPA 200.7
MANGANESE, TOTAL (ug/l)	83	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	88	EPA 200.7
NITRATE-NITROGEN	19	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 05/22/2020

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	5.46	FIELD
pH-LAB (SU)	5.4	SM4500B
POTASSIUM, TOTAL	2.3	EPA 200.7
POTASSIUM, DISSOLVED	2.1	EPA 200.7
SODIUM, TOTAL	8.3	EPA 200.7
SODIUM, DISSOLVED	8.2	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	242	FIELD
SPEC. COND., LAB (umhos/cm)	236	EPA 120.1
SULFATE	2 ND	EPA 300
ALKALINITY	5 ND	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	192	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.1 ND	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 05/22/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		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
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 06/18/2020
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, 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: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DE° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: LCSWMA

Address: 3060 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39° 57 ' 27.63 " Longitude: 76° 26 ' 10.01 "

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

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

Sample Date:(mm/dd/yy) 05/22/2020 Sample Collection Time: 12:29 PM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 06/03/2020

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

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 05/22/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	5 ND	SM20-2321
CALCIUM, TOTAL	10.5	EPA 200.7
CALCIUM, DISSOLVED	11.7	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	20.1	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	10.9	EPA 200.7
MAGNESIUM, DISSOLVED	12.2	EPA 200.7
MANGANESE, TOTAL (ug/l)	110	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	120	EPA 200.7
NITRATE-NITROGEN	14.5	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 05/22/2020

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	5.49	FIELD
pH-LAB (SU)	5.53	SM4500B
POTASSIUM, TOTAL	2.5	EPA 200.7
POTASSIUM, DISSOLVED	2.5	EPA 200.7
SODIUM, TOTAL	8.3	EPA 200.7
SODIUM, DISSOLVED	8.3	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	232	FIELD
SPEC. COND., LAB (umhos/cm)	227	EPA 120.1
SULFATE	8.8	EPA 300
ALKALINITY	5 ND	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	134	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.1	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 05/22/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		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
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 06/18/2020
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, 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: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DE° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: SENSENICH

Address: 3076 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39° 57' 28.2" Longitude: 76° 26' 11.1"

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

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

Sample Date:(mm/dd/yy) 05/26/2020 Sample Collection Time: 9:10 AM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 06/08/2020

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

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS SENSENICH

Sample Date: 05/26/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	10	SM20-2321
CALCIUM, TOTAL	14.1	EPA 200.7
CALCIUM, DISSOLVED	14.2	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	50.1	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	8.7	EPA 200.7
MAGNESIUM, DISSOLVED	9	EPA 200.7
MANGANESE, TOTAL (ug/l)	170	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	180	EPA 200.7
NITRATE-NITROGEN	9.9	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS SENSENICH

Sample Date: 05/26/2020

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	5.39	FIELD
pH-LAB (SU)	5.69	SM4500B
POTASSIUM, TOTAL	3.6	EPA 200.7
POTASSIUM, DISSOLVED	3.7	EPA 200.7
SODIUM, TOTAL	23.6	EPA 200.7
SODIUM, DISSOLVED	24.8	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	259	FIELD
SPEC. COND., LAB (umhos/cm)	337	EPA 120.1
SULFATE	11.3	EPA 300
ALKALINITY	10	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	202	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.75	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.1 ND	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS SENSENICH

Sample Date: 05/26/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		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
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 06/18/2020
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, 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: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DE° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: LCSWMA

Address: 3079 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39° 57' 21.99" Longitude: 76° 26' 10.58"

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

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

Sample Date:(mm/dd/yy) 05/26/2020 Sample Collection Time: 9:43 AM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 06/08/2020

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

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 05/26/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	31	SM20-2321
CALCIUM, TOTAL	9.8	EPA 200.7
CALCIUM, DISSOLVED	10.2	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	32.1	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	5.9	EPA 200.7
MAGNESIUM, DISSOLVED	6.2	EPA 200.7
MANGANESE, TOTAL (ug/l)	160	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	170	EPA 200.7
NITRATE-NITROGEN	0.2 ND	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 05/26/2020

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	6.87	FIELD
pH-LAB (SU)	6.49	SM4500B
POTASSIUM, TOTAL	2.1	EPA 200.7
POTASSIUM, DISSOLVED	2.3	EPA 200.7
SODIUM, TOTAL	14.1	EPA 200.7
SODIUM, DISSOLVED	14.9	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	359	FIELD
SPEC. COND., LAB (umhos/cm)	192	EPA 120.1
SULFATE	11.4	EPA 300
ALKALINITY	31	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	134	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.1 ND	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 05/26/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		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
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 06/18/2020
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, 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: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DE° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: WEBER

Address: 3088 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39° 57' 21" Longitude: 76° 26' 7.1"

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

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

Sample Date:(mm/dd/yy) 05/18/2020 Sample Collection Time: 11:00 AM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 05/26/2020

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

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS WEBER

Sample Date: 05/18/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	171	SM20-2321
CALCIUM, TOTAL	0.18	EPA 200.7
CALCIUM, DISSOLVED	0.17	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	225	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	0.075	EPA 200.7
MAGNESIUM, DISSOLVED	0.1 ND	EPA 200.7
MANGANESE, TOTAL (ug/l)	2.5 ND	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	5 ND	EPA 200.7
NITRATE-NITROGEN	7.5	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS WEBER

Sample Date: 05/18/2020

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	7.57	FIELD
pH-LAB (SU)	7.61	SM4500B
POTASSIUM, TOTAL	2.8	EPA 200.7
POTASSIUM, DISSOLVED	2.9	EPA 200.7
SODIUM, TOTAL	207	EPA 200.7
SODIUM, DISSOLVED	252	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	1157	FIELD
SPEC. COND., LAB (umhos/cm)	1170	EPA 120.1
SULFATE	2 ND	EPA 300
ALKALINITY	171	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	618	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.13	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS WEBER

Sample Date: 05/18/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		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
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 06/18/2020
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, 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: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DE° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: KIRCHNER

Address: 3100 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39° 57' 17.9" Longitude: 76° 26' 6.28"

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

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

Sample Date:(mm/dd/yy) 05/18/2020 Sample Collection Time: 12:14 PM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 06/02/2020

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

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS KIRCHNER

Sample Date: 05/18/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.609	SM4500D
BICARBONATE ALKALINITY	18	SM20-2321
CALCIUM, TOTAL	14.9	EPA 200.7
CALCIUM, DISSOLVED	16.3	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	44	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	68	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	6.3	EPA 200.7
MAGNESIUM, DISSOLVED	7.1	EPA 200.7
MANGANESE, TOTAL (ug/l)	9.9	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	8.6	EPA 200.7
NITRATE-NITROGEN	3.7	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS KIRCHNER

Sample Date: 05/18/2020

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	6.42	FIELD
pH-LAB (SU)	6.48	SM4500B
POTASSIUM, TOTAL	1.4	EPA 200.7
POTASSIUM, DISSOLVED	1.3	EPA 200.7
SODIUM, TOTAL	15.4	EPA 200.7
SODIUM, DISSOLVED	16.6	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	249	FIELD
SPEC. COND., LAB (umhos/cm)	242	EPA 120.1
SULFATE	8	EPA 300
ALKALINITY	18	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	198	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.36	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS KIRCHNER

Sample Date: 05/18/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		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
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 06/18/2020
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, 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: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DE° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: FRY

Address: 3106 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39° 57 ' 17.27 " Longitude: 76° 26 ' 5.6 "

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

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

Sample Date:(mm/dd/yy) 05/26/2020 Sample Collection Time: 9:25 AM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 06/08/2020

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

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS FRY

Sample Date: 05/26/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	15	SM20-2321
CALCIUM, TOTAL	20.7	EPA 200.7
CALCIUM, DISSOLVED	21.1	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	110	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	94	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	14.6	EPA 200.7
MAGNESIUM, DISSOLVED	15.2	EPA 200.7
MANGANESE, TOTAL (ug/l)	51	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	49	EPA 200.7
NITRATE-NITROGEN	12.4	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS FRY

Sample Date: 05/26/2020

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	6.37	FIELD
pH-LAB (SU)	5.88	SM4500B
POTASSIUM, TOTAL	2.3	EPA 200.7
POTASSIUM, DISSOLVED	2.4	EPA 200.7
SODIUM, TOTAL	44.7	EPA 200.7
SODIUM, DISSOLVED	47.8	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	395	FIELD
SPEC. COND., LAB (umhos/cm)	490	EPA 120.1
SULFATE	6.2	EPA 300
ALKALINITY	15	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	364	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.35	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS FRY

Sample Date: 05/26/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		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
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/18/2020
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, 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: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DE° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: BECK

Address: 3125 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39° 57' 11.6" Longitude: 76° 26' 5.4"

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

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

Sample Date:(mm/dd/yy) 05/22/2020 Sample Collection Time: 11:41 AM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 06/03/2020

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

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS BECK

Sample Date: 05/22/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	133	SM20-2321
CALCIUM, TOTAL	65.3	EPA 200.7
CALCIUM, DISSOLVED	73.6	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	121	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	11.5	EPA 200.7
MAGNESIUM, DISSOLVED	13.1	EPA 200.7
MANGANESE, TOTAL (ug/l)	53	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	59	EPA 200.7
NITRATE-NITROGEN	5.9	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS BECK

Sample Date: 05/22/2020

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	7.28	FIELD
pH-LAB (SU)	7.23	SM4500B
POTASSIUM, TOTAL	7.2	EPA 200.7
POTASSIUM, DISSOLVED	7.7	EPA 200.7
SODIUM, TOTAL	54.7	EPA 200.7
SODIUM, DISSOLVED	60	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	759	FIELD
SPEC. COND., LAB (umhos/cm)	752	EPA 120.1
SULFATE	15.2	EPA 300
ALKALINITY	133	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	438	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.65	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.1 ND	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS BECK

Sample Date: 05/22/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE		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
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

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:	**CONTIGUOUS LANDOWNER-3044 RIVER RD**	Workorder:	**3104059**
Purchase Order:	**PO1000126**	Workorder ID:	**CONTIGUOUS LANDOWNER-3044 RIVE**

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.

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.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

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:	**CONTIGUOUS LANDOWNER-3044 RIVER RD**	Workorder:	**3104059**
Purchase Order:	**PO1000126**	Workorder ID:	**CONTIGUOUS LANDOWNER-3044 RIVE**

Dear Mr. Brown:

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.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104059 CONTIGUOUS LANDOWNER-3044 RIVE

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3104059001	3044 River Road, Conestoga, PA	Water	5/22/2020 09:32	5/22/2020 13:53	Mr. Brian G Shade

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104059 CONTIGUOUS LANDOWNER-3044 RIVE

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 preformed 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

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104059 CONTIGUOUS LANDOWNER-3044 RIVE

Lab ID: **3104059001** Date Collected: 5/22/2020 09:32 Matrix: Water
Sample ID: **3044 River Road, Conestoga, PA** Date Received: 5/22/2020 13:53

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:39	DPC	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 13:39	DPC	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 13:39	DPC	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:39	DPC	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:39	DPC	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:39	DPC	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:39	DPC	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			5/27/20 13:39	DPC	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:39	DPC	K
Toluene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:39	DPC	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			5/27/20 13:39	DPC	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 13:39	DPC	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:39	DPC	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			5/27/20 13:39	DPC	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			5/27/20 13:39	DPC	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	62 - 133	SW846 8260B			5/27/20 13:39	DPC	K
4-Bromofluorobenzene (S)	102		%	79 - 114	SW846 8260B			5/27/20 13:39	DPC	K
Dibromofluoromethane (S)	100		%	78 - 116	SW846 8260B			5/27/20 13:39	DPC	K
Toluene-d8 (S)	93.6		%	76 - 127	SW846 8260B			5/27/20 13:39	DPC	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	8		mg/L	5	SM2320B-2011			5/27/20 21:30	R2B	C
Alkalinity, Total	8	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 09:35	JXL	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			5/29/20 00:58	JAM	B
Chloride	21.0		mg/L	2.0	EPA 300.0			5/23/20 07:49	MBW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			5/23/20 07:49	MBW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			6/3/20 11:45	PAG	I
Nitrate-N	18.1		mg/L	0.20	EPA 300.0			5/23/20 07:49	MBW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			5/23/20 07:49	MBW	C
pH	5.72	2	pH_Units		S4500HB-11			5/27/20 21:30	R2B	C
Phenolics	ND		mg/L	0.005	EPA 420.4	5/26/20 12:30	VXF	5/26/20 11:17	VXF	H
Specific Conductance	238		umhos/cm	1	SM2510B-2011			5/27/20 21:30	R2B	C
Sulfate	ND		mg/L	2.0	EPA 300.0			5/23/20 07:49	MBW	C

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104059 CONTIGUOUS LANDOWNER-3044 RIVE

Lab ID: **3104059001** Date Collected: 5/22/2020 09:32 Matrix: Water

Sample ID: **3044 River Road, Conestoga, PA** Date Received: 5/22/2020 13:53

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Total Dissolved Solids	134		mg/L	25	S2540C-11			5/26/20 11:10	LXW	C
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			6/3/20 05:14	PAG	F
Turbidity	ND		NTU	0.10	SM2130B-2011			5/23/20 07:36	R2B	C
METALS										
Calcium, Total	13.6		mg/L	0.050	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:52	MNP	D
Calcium, Dissolved	14.9		mg/L	0.10	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:49	MNP	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:52	MNP	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:49	MNP	E
Magnesium, Total	10.3		mg/L	0.050	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:52	MNP	D
Magnesium, Dissolved	11.4		mg/L	0.10	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:49	MNP	E
Manganese, Total	0.027		mg/L	0.0025	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:52	MNP	D
Manganese, Dissolved	0.029		mg/L	0.0050	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:49	MNP	E
Potassium, Total	1.7		mg/L	0.25	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:52	MNP	D
Potassium, Dissolved	1.5		mg/L	0.50	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:49	MNP	E
Sodium, Total	8.5		mg/L	0.25	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:52	MNP	D
Sodium, Dissolved	8.5		mg/L	0.50	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:49	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	5.78		pH_Units		Field			5/22/20 09:32	BGS	N
Specific Conductance, Field	241		umhos/cm	1	Field			5/22/20 09:32	BGS	N
Temperature	14.50		Deg. C		Field			5/22/20 09:32	BGS	N

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104059 CONTIGUOUS LANDOWNER-3044 RIVE

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3104059001	1	3044 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3104059001	2	3044 River Road, Conestoga, PA	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.				

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3104059 CONTIGUOUS LANDOWNER-3044 RIVE

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3104059001	3044 River Road, Conestoga, PA	ASTM D6919-09		
3104059001	3044 River Road, Conestoga, PA	EPA 200.7	EPA ACID	
3104059001	3044 River Road, Conestoga, PA	EPA 200.7	EPA TRMD	
3104059001	3044 River Road, Conestoga, PA	EPA 300.0		
3104059001	3044 River Road, Conestoga, PA	EPA 410.4		
3104059001	3044 River Road, Conestoga, PA	EPA 420.4	420.4/9066	
3104059001	3044 River Road, Conestoga, PA	Field		
3104059001	3044 River Road, Conestoga, PA	S2540C-11		
3104059001	3044 River Road, Conestoga, PA	S4500HB-11		
3104059001	3044 River Road, Conestoga, PA	SM2130B-2011		
3104059001	3044 River Road, Conestoga, PA	SM2320B-2011		
3104059001	3044 River Road, Conestoga, PA	SM2510B-2011		
3104059001	3044 River Road, Conestoga, PA	SM5310B-2011		
3104059001	3044 River Road, Conestoga, PA	SW846 8260B		
3104059001	3044 River Road, Conestoga, PA	SW846 9020B		

ALS Environmental
301 Fulling Mill Road • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

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

* 3 1 0 4 0 5 9 *

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/#: LCSWMA - Quarterly
Bill To: Lancaster County Solid Waste MA

TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.
Date Required: ______ Approved By: ______
Email? [ ] -Y
Fax? [ ] -Y No.:

	Container Type	AG	AN	AN	CG	—	PL	PL	PL	PL	PL
	Container Size	40 ml	125 ml	250 ml	40 ml	—	250 ml	125 ml	125 ml	500 ml	500 ml
	Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None

ANALYSES/METHOD REQUESTED — Enter Number of Containers Per Sample or Field Results Below.

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3	Sample/COC Comments
1 3044RIVERRD	05/22/20	0932	G	DW	2	1	2	3 2 Gom Sha	X	1	1	1	1	1	
2															
3															
4															
5															
6															
7															
8															
9															
10															

Cooler Temp: 2°C Therm ID: 3c1
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 #:

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: ______

Project Comments:

LOGGED BY (signature): ______ DATE ______ TIME ______
REVIEWED BY (signature): ______ DATE ______ TIME ______

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] ALS	5-22-20	1351	2 [signature]	5/22/20	1353
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Special Processing: USACE [ ] Navy [ ] [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ]

Reportable to PADEP? Yes [ ]
PWSID #

Sample Disposal: Lab [X] Special [ ]

EDDS: Format Type- ______

* G=Grab; C=Composite **Matrix - AI=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:	Work Order #:	Initials:	Date:
LCSWMA	3104159	COM	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? Added COM 5/22		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? pH 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):

[1]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

Rev 1/20/2020

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

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:	**CONTIGUOUS LANDOWNER-3052 RIVER RD**	Workorder:	**3104058**
Purchase Order:	**PO1000126**	Workorder ID:	**CONTIGUOUS LANDOWNER-3052 RIVE**

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.

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

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

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

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:	**CONTIGUOUS LANDOWNER-3052 RIVER RD**	Workorder:	**3104058**
Purchase Order:	**PO1000126**	Workorder ID:	**CONTIGUOUS LANDOWNER-3052 RIVE**

Dear Mr. Brown:

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

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

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

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104058 CONTIGUOUS LANDOWNER-3052 RIVE

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3104058001	3052 River Road, Conestoga, PA	Water	5/22/2020 09:52	5/22/2020 13:53	Mr. Brian G Shade

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104058 CONTIGUOUS LANDOWNER-3052 RIVE

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 preformed 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

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104058 CONTIGUOUS LANDOWNER-3052 RIVE

Lab ID: **3104058001** Date Collected: 5/22/2020 09:52 Matrix: Water

Sample ID: **3052 River Road, Conestoga, PA** Date Received: 5/22/2020 13:53

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:16	DPC	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 13:16	DPC	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 13:16	DPC	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:16	DPC	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:16	DPC	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:16	DPC	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:16	DPC	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			5/27/20 13:16	DPC	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:16	DPC	K
Toluene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:16	DPC	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			5/27/20 13:16	DPC	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 13:16	DPC	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 13:16	DPC	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			5/27/20 13:16	DPC	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			5/27/20 13:16	DPC	K
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 13:16	DPC	K
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			5/27/20 13:16	DPC	K
Dibromofluoromethane (S)	102		%	78 - 116	SW846 8260B			5/27/20 13:16	DPC	K
Toluene-d8 (S)	94.7		%	76 - 127	SW846 8260B			5/27/20 13:16	DPC	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	10		mg/L	5	SM2320B-2011			5/27/20 21:30	R2B	C
Alkalinity, Total	10	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 09:08	JXL	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			5/29/20 00:58	JAM	B
Chloride	20.8		mg/L	2.0	EPA 300.0			5/23/20 07:33	MBW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			5/23/20 07:33	MBW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			6/3/20 11:06	PAG	I
Nitrate-N	17.3		mg/L	0.20	EPA 300.0			5/23/20 07:33	MBW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			5/23/20 07:33	MBW	C
pH	5.66	2	pH_Units		S4500HB-11			5/27/20 21:30	R2B	C
Phenolics	ND	5	mg/L	0.005	EPA 420.4	5/26/20 12:30	VXF	5/26/20 11:17	VXF	H
Specific Conductance	232		umhos/cm	1	SM2510B-2011			5/27/20 21:30	R2B	C
Sulfate	2.3		mg/L	2.0	EPA 300.0			5/23/20 07:33	MBW	C

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104058 CONTIGUOUS LANDOWNER-3052 RIVE

Lab ID: **3104058001** Date Collected: 5/22/2020 09:52 Matrix: Water

Sample ID: **3052 River Road, Conestoga, PA** Date Received: 5/22/2020 13:53

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Total Dissolved Solids	146		mg/L	25	S2540C-11			5/26/20 11:10	LXW	C
Total Organic Carbon (TOC)	ND	3,4	mg/L	0.50	SM5310B-2011			6/1/20 21:44	PAG	F
Turbidity	1.10		NTU	0.10	SM2130B-2011			5/23/20 07:36	R2B	C
METALS										
Calcium, Total	15.0		mg/L	0.050	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:49	MNP	D
Calcium, Dissolved	16.5		mg/L	0.10	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:46	MNP	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:49	MNP	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:46	MNP	E
Magnesium, Total	9.0		mg/L	0.050	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:49	MNP	D
Magnesium, Dissolved	10		mg/L	0.10	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:46	MNP	E
Manganese, Total	0.047		mg/L	0.0025	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:49	MNP	D
Manganese, Dissolved	0.050		mg/L	0.0050	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:46	MNP	E
Potassium, Total	2.0		mg/L	0.25	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:49	MNP	D
Potassium, Dissolved	1.9		mg/L	0.50	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:46	MNP	E
Sodium, Total	7.4		mg/L	0.25	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:49	MNP	D
Sodium, Dissolved	7.5		mg/L	0.50	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:46	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	5.69		pH_Units		Field			5/22/20 09:52	BGS	N
Specific Conductance, Field	228		umhos/cm	1	Field			5/22/20 09:52	BGS	N
Temperature	14.80		Deg. C		Field			5/22/20 09:52	BGS	N

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104058 CONTIGUOUS LANDOWNER-3052 RIVE

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3104058001	1	3052 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3104058001	2	3052 River Road, Conestoga, PA	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.				
3104058001	3	3052 River Road, Conestoga, PA	SM5310B-2011	Total Organic Carbon (TOC)
The QC sample type MSD for method 415.1/9060/5310B was outside the control limits for the analyte Total Organic Carbon (TOC). The % Recovery was reported as 121 and the control limits were 85 to 115.				
3104058001	4	3052 River Road, Conestoga, PA	SM5310B-2011	Total Organic Carbon (TOC)
The QC sample type MSD for method 415.1/9060/5310B was outside the control limits for the analyte Total Organic Carbon (TOC). The RPD was reported as 19.6 and the upper control limit is 15.				
3104058001	5	3052 River Road, Conestoga, PA	EPA 420.4	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 89.9 and the control limits were 90 to 110.				

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3104058 CONTIGUOUS LANDOWNER-3052 RIVE

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3104058001	3052 River Road, Conestoga, PA	ASTM D6919-09		
3104058001	3052 River Road, Conestoga, PA	EPA 200.7	EPA ACID	
3104058001	3052 River Road, Conestoga, PA	EPA 200.7	EPA TRMD	
3104058001	3052 River Road, Conestoga, PA	EPA 300.0		
3104058001	3052 River Road, Conestoga, PA	EPA 410.4		
3104058001	3052 River Road, Conestoga, PA	EPA 420.4	420.4/9066	
3104058001	3052 River Road, Conestoga, PA	Field		
3104058001	3052 River Road, Conestoga, PA	S2540C-11		
3104058001	3052 River Road, Conestoga, PA	S4500HB-11		
3104058001	3052 River Road, Conestoga, PA	SM2130B-2011		
3104058001	3052 River Road, Conestoga, PA	SM2320B-2011		
3104058001	3052 River Road, Conestoga, PA	SM2510B-2011		
3104058001	3052 River Road, Conestoga, PA	SM5310B-2011		
3104058001	3052 River Road, Conestoga, PA	SW846 8260B		
3104058001	3052 River Road, Conestoga, PA	SW846 9020B		

ALS Environmental

301 Fulling Mill Road • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

1 of 1

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

Client Name: LCSWMA - John Miller

Address: 3052 River Road
Conestoga, PA 17516

Contact: John Miller

Phone#: (717) 872-5117

Project Name/#: LCSWMA - Quarterly

Bill To: Lancaster County Solid Waste MA

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

Date Required: _____ Approved By: _____

Email? [ ] -Y _____

Fax? [ ] -Y No.: _____

Container Type	AG	AN	AN	CG	—	PL	PL	PL	P	
Container Size	40 ml	125 ml	250 ml	40 ml	—	250 ml	125 ml	125 ml	500 ml	500 ml
Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3	Sample/COC Comments
					Enter Number of Containers Per Sample or Field Results Below.										
1 3052RIVERRD	05/22/20	0952	G	DW	2	1	2	3 2	X	1	1	1	1	1	
2								60 m							
3								5/12							
4															
5															
6															
7															
8															
9															
10															

(to be completed by Receiving Lab)

Cooler Temp: 3°C 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 #:

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: _____

Project Comments:

LOGGED BY(signature): Date: Time:

REVIEWED BY(signature): Date: Time:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] ALS	5-22-20	1353	2 [signature]	5/22/20	1353
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Special Processing: USACE [ ] Navy [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ]

Reportable to PADEP? Yes [ ]

PWSID # _____

Sample Disposal: Lab [X] Special [ ]

EDDS: Format Type- _____

* G=Grab; C=Composite **Matrix - AI=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

ALS

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
LCSWMA	3104058	GOM	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? Added GOM 5/22		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? Pt 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):	3°C							
Thermometer ID:	309							
Radiological (µCi):								

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

[1]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

Rev 1/20/2020

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

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:	**3104062**
Purchase Order:	**PO1000126**	Workorder ID:	**2ND QTR 2020 3056 RIVER RD**

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.

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.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104062 2ND QTR 2020 3056 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3104062001	3056RIVERRD	Water	5/22/2020 12:19	5/22/2020 13:53	Mr. Brian G Shade

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104062 2ND QTR 2020 3056 RIVER RD

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 preformed 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

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104062 2ND QTR 2020 3056 RIVER RD

Lab ID: **3104062001** Date Collected: 5/22/2020 12:19 Matrix: Water
Sample ID: **3056RIVERRD** Date Received: 5/22/2020 13:53

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:05	DPC	I
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 17:05	DPC	I
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 17:05	DPC	I
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:05	DPC	I
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:05	DPC	I
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:05	DPC	I
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:05	DPC	I
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			5/27/20 17:05	DPC	I
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:05	DPC	I
Toluene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:05	DPC	I
Total Xylenes	ND		ug/L	3.0	SW846 8260B			5/27/20 17:05	DPC	I
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 17:05	DPC	I
Trichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:05	DPC	I
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			5/27/20 17:05	DPC	I
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			5/27/20 17:05	DPC	I
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	62 - 133	SW846 8260B			5/27/20 17:05	DPC	I
4-Bromofluorobenzene (S)	101		%	79 - 114	SW846 8260B			5/27/20 17:05	DPC	I
Dibromofluoromethane (S)	100		%	78 - 116	SW846 8260B			5/27/20 17:05	DPC	I
Toluene-d8 (S)	93.1		%	76 - 127	SW846 8260B			5/27/20 17:05	DPC	I
WET CHEMISTRY										
Alkalinity, Bicarbonate	ND		mg/L	5	SM2320B-2011			5/27/20 21:30	R2B	E
Alkalinity, Total	ND	1	mg/L	5	SM2320B-2011			5/27/20 21:30	R2B	B
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			5/31/20 00:12	JXL	F
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			5/29/20 00:58	JAM	F
Chloride	25.1		mg/L	2.0	EPA 300.0			5/23/20 13:37	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			5/23/20 13:37	MBW	B
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			6/3/20 12:37	PAG	M
Nitrate-N	19.0		mg/L	0.20	EPA 300.0			5/23/20 13:37	MBW	B
Nitrite-N	ND		mg/L	0.20	EPA 300.0			5/23/20 13:37	MBW	B
pH	5.40	2	pH_Units		S4500HB-11			5/27/20 21:30	R2B	E
Phenolics	ND		mg/L	0.005	EPA 420.4	5/26/20 12:30	VXF	5/26/20 11:17	VXF	H
Specific Conductance	236		umhos/cm	1	SM2510B-2011			5/27/20 21:30	R2B	E
Sulfate	ND		mg/L	2.0	EPA 300.0			5/23/20 13:37	MBW	B

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104062 2ND QTR 2020 3056 RIVER RD

Lab ID: **3104062001** Date Collected: 5/22/2020 12:19 Matrix: Water
Sample ID: **3056RIVERRD** Date Received: 5/22/2020 13:53

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Total Dissolved Solids	192		mg/L	25	S2540C-11			5/27/20 14:19	KXH	E
Total Organic Carbon (TOC)	ND	3	mg/L	0.50	SM5310B-2011			6/3/20 14:19	PAG	C
Turbidity	ND		NTU	0.10	SM2130B-2011			5/23/20 07:36	R2B	E
METALS										
Calcium, Total	11.7		mg/L	0.050	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:55	MNP	G
Calcium, Dissolved	12.5		mg/L	0.10	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:52	MNP	L
Iron, Total	ND		mg/L	0.030	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:55	MNP	G
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:52	MNP	L
Magnesium, Total	13.0		mg/L	0.050	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:55	MNP	G
Magnesium, Dissolved	14.0		mg/L	0.10	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:52	MNP	L
Manganese, Total	0.083		mg/L	0.0025	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:55	MNP	G
Manganese, Dissolved	0.088		mg/L	0.0050	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:52	MNP	L
Potassium, Total	2.3		mg/L	0.25	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:55	MNP	G
Potassium, Dissolved	2.1		mg/L	0.50	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:52	MNP	L
Sodium, Total	8.3		mg/L	0.25	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:55	MNP	G
Sodium, Dissolved	8.2		mg/L	0.50	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:52	MNP	L
FIELD PARAMETERS										
pH, Field (SM4500B)	5.46		pH_Units		Field			5/22/20 12:19	BGS	A
Specific Conductance, Field	242		umhos/cm	1	Field			5/22/20 12:19	BGS	A
Temperature	14.20		Deg. C		Field			5/22/20 12:19	BGS	A

Ms. Susan J Scherer
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3104062 2ND QTR 2020 3056 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3104062001	1	3056RIVERRD	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3104062001	2	3056RIVERRD	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.				
3104062001	3	3056RIVERRD	SM5310B-2011	Total Organic Carbon (TOC)
The QC sample type CCV for method 415.1/9060/5310B was outside the control limits for the analyte Total Organic Carbon. The % Recovery was reported as 112 and the control limits were 90 to 110.				

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3104062 2ND QTR 2020 3056 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3104062001	3056RIVERRD	ASTM D6919-09		
3104062001	3056RIVERRD	EPA 200.7	EPA ACID	
3104062001	3056RIVERRD	EPA 200.7	EPA TRMD	
3104062001	3056RIVERRD	EPA 300.0		
3104062001	3056RIVERRD	EPA 410.4		
3104062001	3056RIVERRD	EPA 420.4	420.4/9066	
3104062001	3056RIVERRD	Field		
3104062001	3056RIVERRD	S2540C-11		
3104062001	3056RIVERRD	S4500HB-11		
3104062001	3056RIVERRD	SM2130B-2011		
3104062001	3056RIVERRD	SM2320B-2011		
3104062001	3056RIVERRD	SM2510B-2011		
3104062001	3056RIVERRD	SM5310B-2011		
3104062001	3056RIVERRD	SW846 8260B		
3104062001	3056RIVERRD	SW846 9020B		

ALS Environmental

301 Fulling Mill Road • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

* 3 1 0 4 0 6 2 *

1 of 1

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

(Completed by Receiving Lab)

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/#: LCSWMA - Quarterly

Bill To: Lancaster County Solid Waste MA

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

Date Required: _____ Approved By: _____

Email? [ ] -Y _____

Fax? [ ] -Y No.: _____

Cooler Temp: 0°C Therm ID: 503

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 #:

Container Type	AG	AN	AN	CG	—	PL	PL	PL		
Container Size	40 ml	125 ml	250 ml	40 ml	—	250 ml	125 ml	125 ml	500 ml	500 ml
Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3	Sample/COC Comments
					Enter Number of Containers Per Sample or Field Results Below.										
1 3056RIVERRD	05/22/20	1219	G	DW	2	1	2	2	X	1	1	1	1	1	
2															
3															
4															
5															
6															
7															
8															
9															
10															

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: _____

Project Comments:

LOGGED BY(signature): DATE TIME

REVIEWED BY(signature): DATE TIME

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] EDB ALS	5-22-20	1353	2 [signature]	5/22/20	1350
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Special Processing: USACE [ ] Navy [ ] [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ]

Reportable to PADEP? Yes [ ] PWSID # _____

Sample Disposal: Lab [X] 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

ALS

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
LCSWMA	3104062	COM	5/28/2020

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?[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? pH 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):	0°C							
Thermometer ID:	523							
Radiological (µCi):								

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

[1]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

Rev 1/20/2020

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

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:	**3104063**
Purchase Order:	**PO1000126**	Workorder ID:	**2ND QTR 2020 3060 RIVER RD**

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.

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.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104063 2ND QTR 2020 3060 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3104063001	3060RIVERRD	Water	5/22/2020 12:29	5/22/2020 13:53	Mr. Brian G Shade

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104063 2ND QTR 2020 3060 RIVER RD

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 preformed 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

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104063 2ND QTR 2020 3060 RIVER RD

Lab ID: **3104063001** Date Collected: 5/22/2020 12:29 Matrix: Water

Sample ID: **3060RIVERRD** Date Received: 5/22/2020 13:53

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:28	DPC	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 17:28	DPC	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 17:28	DPC	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:28	DPC	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:28	DPC	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:28	DPC	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:28	DPC	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			5/27/20 17:28	DPC	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:28	DPC	K
Toluene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:28	DPC	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			5/27/20 17:28	DPC	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 17:28	DPC	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:28	DPC	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			5/27/20 17:28	DPC	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			5/27/20 17:28	DPC	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	62 - 133	SW846 8260B			5/27/20 17:28	DPC	K
4-Bromofluorobenzene (S)	104		%	79 - 114	SW846 8260B			5/27/20 17:28	DPC	K
Dibromofluoromethane (S)	99.9		%	78 - 116	SW846 8260B			5/27/20 17:28	DPC	K
Toluene-d8 (S)	94.3		%	76 - 127	SW846 8260B			5/27/20 17:28	DPC	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	ND		mg/L	5	SM2320B-2011			5/27/20 21:30	R2B	C
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			5/30/20 05:21	JXL	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			5/29/20 00:58	JAM	B
Chloride	20.1		mg/L	2.0	EPA 300.0			5/23/20 13:53	MBW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			5/23/20 13:53	MBW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			6/3/20 12:59	PAG	I
Nitrate-N	14.5		mg/L	0.20	EPA 300.0			5/23/20 13:53	MBW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			5/23/20 13:53	MBW	C
pH	5.53	2	pH_Units		S4500HB-11			5/27/20 21:30	R2B	C
Phenolics	ND		mg/L	0.005	EPA 420.4	5/26/20 12:30	VXF	5/26/20 11:17	VXF	H
Specific Conductance	227		umhos/cm	1	SM2510B-2011			5/27/20 21:30	R2B	C
Sulfate	8.8		mg/L	2.0	EPA 300.0			5/23/20 13:53	MBW	C

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104063 2ND QTR 2020 3060 RIVER RD

Lab ID: **3104063001** Date Collected: 5/22/2020 12:29 Matrix: Water
Sample ID: **3060RIVERRD** Date Received: 5/22/2020 13:53

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Total Dissolved Solids	134		mg/L	25	S2540C-11			5/27/20 14:19	KXH	C
Total Organic Carbon (TOC)	ND	3	mg/L	0.50	SM5310B-2011			6/3/20 14:19	PAG	F
Turbidity	0.10		NTU	0.10	SM2130B-2011			5/23/20 07:36	R2B	C
METALS										
Calcium, Total	10.5		mg/L	0.050	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:59	MNP	D
Calcium, Dissolved	11.7		mg/L	0.10	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:56	MNP	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:59	MNP	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:56	MNP	E
Magnesium, Total	10.9		mg/L	0.050	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:59	MNP	D
Magnesium, Dissolved	12.2		mg/L	0.10	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:56	MNP	E
Manganese, Total	0.11		mg/L	0.0025	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:59	MNP	D
Manganese, Dissolved	0.12		mg/L	0.0050	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:56	MNP	E
Potassium, Total	2.5		mg/L	0.25	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:59	MNP	D
Potassium, Dissolved	2.5		mg/L	0.50	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:56	MNP	E
Sodium, Total	8.3		mg/L	0.25	EPA 200.7	5/26/20 16:32	SXC	5/27/20 15:59	MNP	D
Sodium, Dissolved	8.3		mg/L	0.50	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:56	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	5.49		pH_Units		Field			5/22/20 12:29	BGS	N
Specific Conductance, Field	232		umhos/cm	1	Field			5/22/20 12:29	BGS	N
Temperature	14.20		Deg. C		Field			5/22/20 12:29	BGS	N

Ms. Susan J Scherer
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3104063 2ND QTR 2020 3060 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3104063001	1	3060RIVERRD	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3104063001	2	3060RIVERRD	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.				
3104063001	3	3060RIVERRD	SM5310B-2011	Total Organic Carbon (TOC)
The QC sample type CCV for method 415.1/9060/5310B was outside the control limits for the analyte Total Organic Carbon. The % Recovery was reported as 112 and the control limits were 90 to 110.				

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3104063 2ND QTR 2020 3060 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3104063001	3060RIVERRD	ASTM D6919-09		
3104063001	3060RIVERRD	EPA 200.7	EPA ACID	
3104063001	3060RIVERRD	EPA 200.7	EPA TRMD	
3104063001	3060RIVERRD	EPA 300.0		
3104063001	3060RIVERRD	EPA 410.4		
3104063001	3060RIVERRD	EPA 420.4	420.4/9066	
3104063001	3060RIVERRD	Field		
3104063001	3060RIVERRD	S2540C-11		
3104063001	3060RIVERRD	S4500HB-11		
3104063001	3060RIVERRD	SM2130B-2011		
3104063001	3060RIVERRD	SM2320B-2011		
3104063001	3060RIVERRD	SM2510B-2011		
3104063001	3060RIVERRD	SM5310B-2011		
3104063001	3060RIVERRD	SW846 8260B		
3104063001	3060RIVERRD	SW846 9020B		

ALS Environmental

301 Fulling Mill Road • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

3104063

1 of 1

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

(Shaded by Receiving Lab)

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/#: LCSWMA - Quarterly

Bill To: Lancaster County Solid Waste MA

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

Date Required: _____ Approved By: _____

Email? [ ]-Y _____

Fax? [ ]-Y No.: _____

Cooler Temp: 2°C Therm ID: 523

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 #:

Container Type	AG	AN	AN	CG	—	PL	PL	PL	PL	
Container Size	40 ml	125 ml	250 ml	40 ml	—	250 ml	125 ml	125 ml	500 ml	500 ml
Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3	Sample/COC Comments
					Enter Number of Containers Per Sample or Field Results Below.										
1 3060RIVERRD	05/22/20	1229	G	DW	2	1	2	3 2 GCM 5/22	X	1	1	1	1	1	
2															
3															
4															
5															
6															
7															
8															
9															
10															

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: _____

Project Comments:

LOGGED BY(signature): Date: Time:

REVIEWED BY(signature): Date: Time:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 BG Driscoll ALS	5-22-20	1353	2 [signature]	5/22/20	1353
3			4		
5			6		
7			8		
9			10		

Data Deliverables: ☐Standard ☐CLP-like ☐USACE ☐

Special Processing: USACE ☐ Navy ☐ ☐

State Samples Collected In: ☐NY ☐NJ ☒PA ☐NC ☐

Reportable to PADEP? Yes ☐ PWSID # _____

Sample Disposal: Lab ☒ Special ☐

EDDS: Format Type-

* G=Grab; C=Composite ** Matrix - Al=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

Rev 8/04

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
LCSWMA	3104063	GOM	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? Added COM 5/22		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? PH 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:	503							
Radiological (µCi):								

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

[1]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

Rev 1/20/2020

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

June 9, 2020

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

Certificate of Analysis

Project Name:	**CONTIGUOUS LANDOWNER-3076 RIVER RD**	Workorder:	**3104419**
Purchase Order:	**PO1000126**	Workorder ID:	**LCSWMA-Quarterly**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, May 26, 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.

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

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

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

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104419 LCSWMA-Quarterly

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3104419001	3076 River Road, Conestoga, PA	Water	5/26/2020 09:10	5/26/2020 15:33	Mr. Brian G Shade

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104419 LCSWMA-Quarterly

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 preformed 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

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104419 LCSWMA-Quarterly

Lab ID: **3104419001** Date Collected: 5/26/2020 09:10 Matrix: Water
Sample ID: **3076 River Road, Conestoga, PA** Date Received: 5/26/2020 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			5/28/20 15:26	TMP	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/28/20 15:26	TMP	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/28/20 15:26	TMP	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/28/20 15:26	TMP	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/28/20 15:26	TMP	K
trans-1,2-Dichloroethene	ND	3	ug/L	1.0	SW846 8260B			5/28/20 15:26	TMP	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			5/28/20 15:26	TMP	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			5/28/20 15:26	TMP	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			5/28/20 15:26	TMP	K
Toluene	ND		ug/L	1.0	SW846 8260B			5/28/20 15:26	TMP	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			5/28/20 15:26	TMP	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			5/28/20 15:26	TMP	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			5/28/20 15:26	TMP	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			5/28/20 15:26	TMP	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			5/28/20 15:26	TMP	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	62 - 133	SW846 8260B			5/28/20 15:26	TMP	K
4-Bromofluorobenzene (S)	94.4		%	79 - 114	SW846 8260B			5/28/20 15:26	TMP	K
Dibromofluoromethane (S)	106		%	78 - 116	SW846 8260B			5/28/20 15:26	TMP	K
Toluene-d8 (S)	89.7		%	76 - 127	SW846 8260B			5/28/20 15:26	TMP	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	10		mg/L	5	SM2320B-2011			5/30/20 16:39	R2B	C
Alkalinity, Total	10	4	mg/L	5	SM2320B-2011			5/30/20 16:39	R2B	A
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			6/1/20 02:33	JXL	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			5/29/20 01:41	JAM	B
Chloride	50.1		mg/L	2.0	EPA 300.0			5/27/20 07:36	MBW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			5/27/20 07:36	MBW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			6/3/20 14:41	PAG	I
Nitrate-N	9.9		mg/L	0.20	EPA 300.0			5/27/20 07:36	MBW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			5/27/20 07:36	MBW	C
pH	5.69	1	pH_Units		S4500HB-11			5/29/20 15:52	R2B	C
Phenolics	ND	2	mg/L	0.005	EPA 420.4	5/27/20 20:00	VXF	5/28/20 15:23	C_D	H
Specific Conductance	337		umhos/cm	1	SM2510B-2011			5/29/20 15:52	R2B	C
Sulfate	11.3		mg/L	2.0	EPA 300.0			5/27/20 07:36	MBW	C

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104419 LCSWMA-Quarterly

Lab ID: **3104419001** Date Collected: 5/26/2020 09:10 Matrix: Water

Sample ID: **3076 River Road, Conestoga, PA** Date Received: 5/26/2020 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Total Dissolved Solids	202		mg/L	25	S2540C-11			5/28/20 13:11	KXH	C
Total Organic Carbon (TOC)	0.75		mg/L	0.50	SM5310B-2011			6/8/20 18:38	PAG	F
Turbidity	ND		NTU	0.10	SM2130B-2011			5/28/20 07:39	R2B	C
METALS										
Calcium, Total	14.1		mg/L	0.050	EPA 200.7	5/28/20 15:22	SXC	5/29/20 13:54	SRT	D
Calcium, Dissolved	14.2		mg/L	0.10	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:01	SRT	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	5/28/20 15:22	SXC	5/29/20 13:54	SRT	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:01	SRT	E
Magnesium, Total	8.7		mg/L	0.050	EPA 200.7	5/28/20 15:22	SXC	5/29/20 13:54	SRT	D
Magnesium, Dissolved	9.0		mg/L	0.10	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:01	SRT	E
Manganese, Total	0.17		mg/L	0.0025	EPA 200.7	5/28/20 15:22	SXC	5/29/20 13:54	SRT	D
Manganese, Dissolved	0.18		mg/L	0.0050	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:01	SRT	E
Potassium, Total	3.6		mg/L	0.25	EPA 200.7	5/28/20 15:22	SXC	5/29/20 13:54	SRT	D
Potassium, Dissolved	3.7		mg/L	0.50	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:01	SRT	E
Sodium, Total	23.6		mg/L	0.25	EPA 200.7	5/28/20 15:22	SXC	5/29/20 13:54	SRT	D
Sodium, Dissolved	24.8		mg/L	0.50	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:01	SRT	E
FIELD PARAMETERS										
pH, Field (SM4500B)	5.39		pH_Units		Field			5/26/20 09:10	BGS	N
Specific Conductance, Field	259		umhos/cm	1	Field			5/26/20 09:10	BGS	N
Temperature	14.70		Deg. C		Field			5/26/20 09:10	BGS	N

Ms. Susan J Scherer
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3104419 LCSWMA-Quarterly

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3104419001	1	3076 River Road, Conestoga, PA	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.				
3104419001	2	3076 River Road, Conestoga, PA	EPA 420.4	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 67.7 and the control limits were 90 to 110.				
3104419001	3	3076 River Road, Conestoga, PA	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 123 and the control limits were 71 to 122.				
3104419001	4	3076 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3104419 LCSWMA-Quarterly

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3104419001	3076 River Road, Conestoga, PA	ASTM D6919-09		
3104419001	3076 River Road, Conestoga, PA	EPA 200.7	EPA ACID	
3104419001	3076 River Road, Conestoga, PA	EPA 200.7	EPA TRMD	
3104419001	3076 River Road, Conestoga, PA	EPA 300.0		
3104419001	3076 River Road, Conestoga, PA	EPA 410.4		
3104419001	3076 River Road, Conestoga, PA	EPA 420.4	420.4/9066	
3104419001	3076 River Road, Conestoga, PA	Field		
3104419001	3076 River Road, Conestoga, PA	S2540C-11		
3104419001	3076 River Road, Conestoga, PA	S4500HB-11		
3104419001	3076 River Road, Conestoga, PA	SM2130B-2011		
3104419001	3076 River Road, Conestoga, PA	SM2320B-2011		
3104419001	3076 River Road, Conestoga, PA	SM2510B-2011		
3104419001	3076 River Road, Conestoga, PA	SM5310B-2011		
3104419001	3076 River Road, Conestoga, PA	SW846 8260B		
3104419001	3076 River Road, Conestoga, PA	SW846 9020B		

ALS Environmental

301 Fulling Mill Road • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

COC #:

ALS Quote

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

Client Name: LCSWMA - Brian Sensenich

Address: 3076 Rover Road
Conestoga, PA 17516

Contact: Brian Sensenich

Phone#: (717) 676-5779

Project Name/#: LCSWMA - Quarterly

Bill To: LCSWMA - Brian Sensenich

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

Date Required: _____ Approved By: _____

Email? [ ] -Y _____

Fax? [ ] -Y No.: _____

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3
Container Type					AG	AN	AN	CG	—	PL	PL	PL	PL	PL
Container Size					40 ml	125 ml	250 ml	40 ml	—	250 ml	125 ml	125 ml	500 ml	500 ml
Preservative					HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None
					Enter Number of Containers Per Sample or Field Results Below.									
1 3076RIVERRD	05/26/20	0910	G	DW	2	1	2	2 3 X		1	1	1	1	1
2														
3														
4														
5														
6														
7														
8														
9														
10														

ANALYSES/METHOD REQUESTED

Cooler Temp: 0 — Therm. ID: _____

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

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: _____

Project Comments:

LOGGED BY(signature): DATE TIME

REVIEWED BY(signature): DATE TIME

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] DLB ALS	5-26-20	1533	2 GSM	5/26/2020	1533
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Special Processing: USACE [ ] Navy [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ]

Reportable to PADEP? Yes [ ] PWSID # _____

Sample Disposal: Lab [X] Special [ ]

EDDS: Format Type- _____

* G=Grab; C=Composite **Matrix - AI=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:	Work Order #:	Initials:	Date:
LCSWMA	3164419		5/27/20

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 #:	1							
Temperature (°C):	6							
Thermometer ID:	304							
Radiological (µCi):								

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

See coc

[1]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

Rev 1/20/2020

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

June 9, 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:	**3104421**
Purchase Order:	**PO1000126**	Workorder ID:	**2ND QTR 2020 3079 RIVER RD**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, May 26, 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.

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.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104421 2ND QTR 2020 3079 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3104421001	3079RIVERRD	Water	5/26/2020 09:43	5/26/2020 15:33	Mr. Brian G Shade

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104421 2ND QTR 2020 3079 RIVER RD

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 preformed 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

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104421 2ND QTR 2020 3079 RIVER RD

Lab ID: **3104421001** Date Collected: 5/26/2020 09:43 Matrix: Water
Sample ID: **3079RIVERRD** Date Received: 5/26/2020 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			5/28/20 16:12	TMP	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/28/20 16:12	TMP	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/28/20 16:12	TMP	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/28/20 16:12	TMP	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/28/20 16:12	TMP	K
trans-1,2-Dichloroethene	ND	3	ug/L	1.0	SW846 8260B			5/28/20 16:12	TMP	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			5/28/20 16:12	TMP	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			5/28/20 16:12	TMP	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			5/28/20 16:12	TMP	K
Toluene	ND		ug/L	1.0	SW846 8260B			5/28/20 16:12	TMP	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			5/28/20 16:12	TMP	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			5/28/20 16:12	TMP	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			5/28/20 16:12	TMP	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			5/28/20 16:12	TMP	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			5/28/20 16:12	TMP	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	62 - 133	SW846 8260B			5/28/20 16:12	TMP	K
4-Bromofluorobenzene (S)	97.1		%	79 - 114	SW846 8260B			5/28/20 16:12	TMP	K
Dibromofluoromethane (S)	105		%	78 - 116	SW846 8260B			5/28/20 16:12	TMP	K
Toluene-d8 (S)	90.3		%	76 - 127	SW846 8260B			5/28/20 16:12	TMP	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	31		mg/L	5	SM2320B-2011			5/29/20 15:52	R2B	C
Alkalinity, Total	31	1	mg/L	5	SM2320B-2011			5/29/20 15:52	R2B	A
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			6/1/20 00:15	JXL	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			5/29/20 01:41	JAM	B
Chloride	32.1		mg/L	2.0	EPA 300.0			5/27/20 07:14	MBW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			5/27/20 07:14	MBW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			6/3/20 16:22	PAG	I
Nitrate-N	ND		mg/L	0.20	EPA 300.0			5/27/20 07:14	MBW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			5/27/20 07:14	MBW	C
pH	6.49	2	pH_Units		S4500HB-11			5/29/20 15:52	R2B	C
Phenolics	ND		mg/L	0.005	EPA 420.4	5/27/20 20:00	VXF	5/28/20 15:23	C_D	H
Specific Conductance	192		umhos/cm	1	SM2510B-2011			5/29/20 15:52	R2B	C
Sulfate	11.4		mg/L	2.0	EPA 300.0			5/27/20 07:14	MBW	C

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104421 2ND QTR 2020 3079 RIVER RD

Lab ID: **3104421001** Date Collected: 5/26/2020 09:43 Matrix: Water
Sample ID: **3079RIVERRD** Date Received: 5/26/2020 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Total Dissolved Solids	134		mg/L	25	S2540C-11			5/28/20 13:11	KXH	C
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			6/8/20 18:38	PAG	F
Turbidity	ND		NTU	0.10	SM2130B-2011			5/28/20 07:39	R2B	C
METALS										
Calcium, Total	9.8		mg/L	0.050	EPA 200.7	5/28/20 15:22	SXC	5/29/20 14:08	SRT	D
Calcium, Dissolved	10.2		mg/L	0.10	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:15	SRT	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	5/28/20 15:22	SXC	5/29/20 14:08	SRT	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:15	SRT	E
Magnesium, Total	5.9		mg/L	0.050	EPA 200.7	5/28/20 15:22	SXC	5/29/20 14:08	SRT	D
Magnesium, Dissolved	6.2		mg/L	0.10	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:15	SRT	E
Manganese, Total	0.16		mg/L	0.0025	EPA 200.7	5/28/20 15:22	SXC	5/29/20 14:08	SRT	D
Manganese, Dissolved	0.17		mg/L	0.0050	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:15	SRT	E
Potassium, Total	2.1		mg/L	0.25	EPA 200.7	5/28/20 15:22	SXC	5/29/20 14:08	SRT	D
Potassium, Dissolved	2.3		mg/L	0.50	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:15	SRT	E
Sodium, Total	14.1		mg/L	0.25	EPA 200.7	5/28/20 15:22	SXC	5/29/20 14:08	SRT	D
Sodium, Dissolved	14.9		mg/L	0.50	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:15	SRT	E
FIELD PARAMETERS										
pH, Field (SM4500B)	6.87		pH_Units		Field			5/26/20 09:43	BGS	N
Specific Conductance, Field	359		umhos/cm	1	Field			5/26/20 09:43	BGS	N
Temperature	15.40		Deg. C		Field			5/26/20 09:43	BGS	N

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104421 2ND QTR 2020 3079 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3104421001	1	3079RIVERRD	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3104421001	2	3079RIVERRD	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.				
3104421001	3	3079RIVERRD	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 123 and the control limits were 71 to 122.				

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3104421 2ND QTR 2020 3079 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3104421001	3079RIVERRD	ASTM D6919-09		
3104421001	3079RIVERRD	EPA 200.7	EPA ACID	
3104421001	3079RIVERRD	EPA 200.7	EPA TRMD	
3104421001	3079RIVERRD	EPA 300.0		
3104421001	3079RIVERRD	EPA 410.4		
3104421001	3079RIVERRD	EPA 420.4	420.4/9066	
3104421001	3079RIVERRD	Field		
3104421001	3079RIVERRD	S2540C-11		
3104421001	3079RIVERRD	S4500HB-11		
3104421001	3079RIVERRD	SM2130B-2011		
3104421001	3079RIVERRD	SM2320B-2011		
3104421001	3079RIVERRD	SM2510B-2011		
3104421001	3079RIVERRD	SM5310B-2011		
3104421001	3079RIVERRD	SW846 8260B		
3104421001	3079RIVERRD	SW846 9020B		

ALS Environmental

301 Fulling Mill Road • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

COC #:

ALS Quote #:

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

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/#: LCSWMA - Quarterly Fire Co.

Bill To: Lancaster County Solid Waste MA

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

Date Required: _____ Approved By: _____

Email? [ ] -Y

Fax? [ ] -Y No.: _____

Container Type	AG	AN	AN	CG	—	PL	PL	PL	PL	PL
Container Size	40 ml	125 ml	250 ml	40 ml	—	250 ml	125 ml	125 ml	500 ml	500 ml
Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3
					Enter Number of Containers Per Sample or Field Results Below.									
1 3079RIVERRD	05/26/20	0943	G	DW	2	1	2	3	x	1	1	1	1	1
2								W527-20						
3														
4														
5														
6														
7														
8														
9														
10														

Receip...

Cooler Temp: 6°C Therm ID: 307

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

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: _____

Project Comments:

LOGGED BY(signature): DATE TIME

REVIEWED BY(signature): DATE TIME

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] EDD ALS	5-26-20	1539	2 [signature]	5/26/20	1553
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Special Processing: USACE [ ] Navy [ ] [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ]

Reportable to PADEP? Yes [ ] PWSID # _____

Sample Disposal: Lab [X] Special [ ]

EDDS: Format Type- _____

* G=Grab; C=Composite

**Matrix - AI=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: LCSWMA | Work Order #: 3104421 | Initials: | Date: WJ 5.27.20

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 #:	1							
Temperature (°C):	6							
Thermometer ID:	304							
Radiological (µCi):								

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

See ccc

[1]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

Rev 1/20/2020

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

May 29, 2020

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

Certificate of Analysis

Project Name:	**CONTIGUOUS LANDOWNER-3088 RIVER RD**	Workorder:	**3102942**
Purchase Order:	**PO1000126**	Workorder ID:	**2ND QTR 2020-3088 RIVER RD**

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.

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

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

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

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3102942 2ND QTR 2020-3088 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3102942001	3088 River Road, Conestoga PA	Water	5/18/2020 11:00	5/18/2020 15:55	Mr. Brian G Shade

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3102942 2ND QTR 2020-3088 RIVER RD

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 preformed 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

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3102942 2ND QTR 2020-3088 RIVER RD

Lab ID: **3102942001** Date Collected: 5/18/2020 11:00 Matrix: Water

Sample ID: **3088 River Road, Conestoga PA** Date Received: 5/18/2020 15:55

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:49	TMP	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/20/20 20:49	TMP	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/20/20 20:49	TMP	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:49	TMP	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:49	TMP	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:49	TMP	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:49	TMP	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			5/20/20 20:49	TMP	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:49	TMP	K
Toluene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:49	TMP	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			5/20/20 20:49	TMP	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			5/20/20 20:49	TMP	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:49	TMP	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			5/20/20 20:49	TMP	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			5/20/20 20:49	TMP	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	96.3		%	62 - 133	SW846 8260B			5/20/20 20:49	TMP	K
4-Bromofluorobenzene (S)	99.9		%	79 - 114	SW846 8260B			5/20/20 20:49	TMP	K
Dibromofluoromethane (S)	84.7		%	78 - 116	SW846 8260B			5/20/20 20:49	TMP	K
Toluene-d8 (S)	94.9		%	76 - 127	SW846 8260B			5/20/20 20:49	TMP	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	171		mg/L	5	SM2320B-2011			5/19/20 23:20	R2B	C
Alkalinity, Total	171	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 04:32	JXL	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			5/19/20 01:43	JAM	B
Chloride	225		mg/L	5.0	EPA 300.0			5/20/20 06:11	MBW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			5/19/20 12:23	MBW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			5/26/20 15:04	PAG	I
Nitrate-N	7.5		mg/L	0.20	EPA 300.0			5/19/20 12:23	MBW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			5/19/20 12:23	MBW	C
pH	7.61	2	pH_Units		S4500HB-11			5/19/20 23:20	R2B	C
Phenolics	ND		mg/L	0.005	EPA 420.4	5/19/20 12:00	VXF	5/19/20 14:40	C_D	H
Specific Conductance	1170		umhos/cm	1	SM2510B-2011			5/19/20 23:20	R2B	C
Sulfate	ND		mg/L	2.0	EPA 300.0			5/19/20 12:23	MBW	C

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3102942 2ND QTR 2020-3088 RIVER RD

Lab ID: **3102942001** Date Collected: 5/18/2020 11:00 Matrix: Water

Sample ID: **3088 River Road, Conestoga PA** Date Received: 5/18/2020 15:55

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Total Dissolved Solids	618		mg/L	25	S2540C-11			5/20/20 10:55	KXH	C
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			5/19/20 21:59	PAG	F
Turbidity	0.13		NTU	0.10	SM2130B-2011			5/19/20 06:34	R2B	C
METALS										
Calcium, Total	0.18		mg/L	0.050	EPA 200.7	5/20/20 15:20	SXC	5/21/20 17:19	MNP	D
Calcium, Dissolved	0.17		mg/L	0.10	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:39	MNP	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	5/20/20 15:20	SXC	5/21/20 17:19	MNP	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:39	MNP	E
Magnesium, Total	0.075		mg/L	0.050	EPA 200.7	5/20/20 15:20	SXC	5/21/20 17:19	MNP	D
Magnesium, Dissolved	ND		mg/L	0.10	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:39	MNP	E
Manganese, Total	ND		mg/L	0.0025	EPA 200.7	5/20/20 15:20	SXC	5/21/20 17:19	MNP	D
Manganese, Dissolved	ND		mg/L	0.0050	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:39	MNP	E
Potassium, Total	2.8		mg/L	0.25	EPA 200.7	5/20/20 15:20	SXC	5/21/20 17:19	MNP	D
Potassium, Dissolved	2.9		mg/L	0.50	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:39	MNP	E
Sodium, Total	207		mg/L	0.25	EPA 200.7	5/20/20 15:20	SXC	5/21/20 17:19	MNP	D
Sodium, Dissolved	252		mg/L	0.50	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:39	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	7.57		pH_Units		Field			5/18/20 11:00	BGS	M
Specific Conductance, Field	1157		umhos/cm	1	Field			5/18/20 11:00	BGS	M
Temperature	16.40		Deg. C		Field			5/18/20 11:00	BGS	M

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3102942 2ND QTR 2020-3088 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3102942001	1	3088 River Road, Conestoga PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3102942001	2	3088 River Road, Conestoga PA	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.				

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3102942 2ND QTR 2020-3088 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3102942001	3088 River Road, Conestoga PA	ASTM D6919-09		
3102942001	3088 River Road, Conestoga PA	EPA 200.7	EPA ACID	
3102942001	3088 River Road, Conestoga PA	EPA 200.7	EPA TRMD	
3102942001	3088 River Road, Conestoga PA	EPA 300.0		
3102942001	3088 River Road, Conestoga PA	EPA 410.4		
3102942001	3088 River Road, Conestoga PA	EPA 420.4	420.4/9066	
3102942001	3088 River Road, Conestoga PA	Field		
3102942001	3088 River Road, Conestoga PA	S2540C-11		
3102942001	3088 River Road, Conestoga PA	S4500HB-11		
3102942001	3088 River Road, Conestoga PA	SM2130B-2011		
3102942001	3088 River Road, Conestoga PA	SM2320B-2011		
3102942001	3088 River Road, Conestoga PA	SM2510B-2011		
3102942001	3088 River Road, Conestoga PA	SM5310B-2011		
3102942001	3088 River Road, Conestoga PA	SW846 8260B		
3102942001	3088 River Road, Conestoga PA	SW846 9020B		

ALS Environmental

34 Dogwood Lane • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

3102942

42 — 1 of 1

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

Client Name: LCSWMA - Hans Weber and Deb Kalbach

Address: 3088 River Road
Conestoga, PA 17516

Contact: Hans Weber and Deb Kalbach

Phone#: (717) 419-7982

Project Name/#: LCSWMA - Quarterly

Bill To: LCSWMA - Hans Weber and Deb Kalbach

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

Date Required: _____ Approved By: _____

Email? [ ] -Y _____

Fax? [ ] -Y No.: _____

Container Type	AG	AN	AN	CG	—	PL	PL	PL		
Container Size	40 ml	125 ml	250 ml	40 ml	—	250 ml	125 ml	125 ml	500 ml	500 ml
Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3	Sample/COC Comments
					Enter Number of Containers Per Sample or Field Results Below.										
1 3088RIVER RD	05/18/20	1100	G	DW	2	1	2	3		1	1	1	1	1	
2															
3															
4															
5															
6															
7															
8															
9															
10															

(Completed by Receiving Lab)

Cooler Temp: 5 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 #:

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: _____

Project Comments:

LOGGED BY(signature): DATE TIME

REVIEWED BY(signature): DATE TIME

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] DB: ALS	5-14-20	1555	2 [signature]	5/18/20	1555
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Special Processing: USACE [ ] Navy [ ] [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ]

Reportable to PADEP? Yes [ ] PWSID #

Sample Disposal: Lab [X] 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: LCSWMA Work Order #: 3100942 Initials: TS Date: 5/8/20

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? 3 VOCs		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): 5

Thermometer ID: 309

Radiological (µCi): _____

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

[1]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

Rev 1/20/2020

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

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:	**CONTIGUOUS LANDOWNER-3100 RIVER RD**	Workorder:	**3102941**
Purchase Order:	**PO1000126**	Workorder ID:	**2ND QTR 2020-3100 RIVER RD**

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.

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

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

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

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3102941 2ND QTR 2020-3100 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3102941001	3100 River Road, Conestoga, PA	Water	5/18/2020 12:14	5/18/2020 15:55	Mr. Brian G Shade

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3102941 2ND QTR 2020-3100 RIVER RD

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 preformed 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

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3102941 2ND QTR 2020-3100 RIVER RD

Lab ID: **3102941001** Date Collected: 5/18/2020 12:14 Matrix: Water
Sample ID: **3100 River Road, Conestoga, PA** Date Received: 5/18/2020 15:55

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:27	TMP	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/20/20 20:27	TMP	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/20/20 20:27	TMP	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:27	TMP	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:27	TMP	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:27	TMP	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:27	TMP	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			5/20/20 20:27	TMP	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:27	TMP	K
Toluene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:27	TMP	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			5/20/20 20:27	TMP	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			5/20/20 20:27	TMP	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			5/20/20 20:27	TMP	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			5/20/20 20:27	TMP	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			5/20/20 20:27	TMP	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	93.1		%	62 - 133	SW846 8260B			5/20/20 20:27	TMP	K
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			5/20/20 20:27	TMP	K
Dibromofluoromethane (S)	80.9		%	78 - 116	SW846 8260B			5/20/20 20:27	TMP	K
Toluene-d8 (S)	95.5		%	76 - 127	SW846 8260B			5/20/20 20:27	TMP	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	18		mg/L	5	SM2320B-2011			5/19/20 23:20	R2B	C
Alkalinity, Total	18	1	mg/L	5	SM2320B-2011			5/19/20 23:20	R2B	A
Ammonia-N	0.609		mg/L	0.100	ASTM D6919-09			5/24/20 02:55	JXL	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			5/19/20 01:43	JAM	B
Chloride	44.0		mg/L	2.0	EPA 300.0			5/19/20 12:06	MBW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			5/19/20 12:06	MBW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			5/26/20 13:31	PAG	I
Nitrate-N	3.7		mg/L	0.20	EPA 300.0			5/19/20 12:06	MBW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			5/19/20 12:06	MBW	C
pH	6.48	2	pH_Units		S4500HB-11			5/19/20 23:20	R2B	C
Phenolics	ND		mg/L	0.005	EPA 420.4	5/19/20 12:00	VXF	5/19/20 14:40	C_D	H
Specific Conductance	242		umhos/cm	1	SM2510B-2011			5/19/20 23:20	R2B	C
Sulfate	8.0		mg/L	2.0	EPA 300.0			5/19/20 12:06	MBW	C

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3102941 2ND QTR 2020-3100 RIVER RD

Lab ID: **3102941001** Date Collected: 5/18/2020 12:14 Matrix: Water
Sample ID: **3100 River Road, Conestoga, PA** Date Received: 5/18/2020 15:55

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Total Dissolved Solids	198		mg/L	25	S2540C-11			5/20/20 10:55	KXH	C
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			6/2/20 16:07	PAG	F
Turbidity	0.36		NTU	0.10	SM2130B-2011			5/19/20 06:34	R2B	C
METALS										
Calcium, Total	14.9		mg/L	0.050	EPA 200.7	5/19/20 15:57	SXC	5/20/20 15:26	MNP	D
Calcium, Dissolved	16.3		mg/L	0.10	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:22	MNP	E
Iron, Total	0.068		mg/L	0.030	EPA 200.7	5/19/20 15:57	SXC	5/20/20 15:26	MNP	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:22	MNP	E
Magnesium, Total	6.3		mg/L	0.050	EPA 200.7	5/19/20 15:57	SXC	5/20/20 15:26	MNP	D
Magnesium, Dissolved	7.1		mg/L	0.10	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:22	MNP	E
Manganese, Total	0.0099		mg/L	0.0025	EPA 200.7	5/19/20 15:57	SXC	5/20/20 15:26	MNP	D
Manganese, Dissolved	0.0086		mg/L	0.0050	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:22	MNP	E
Potassium, Total	1.4		mg/L	0.25	EPA 200.7	5/19/20 15:57	SXC	5/20/20 15:26	MNP	D
Potassium, Dissolved	1.3		mg/L	0.50	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:22	MNP	E
Sodium, Total	15.4		mg/L	0.25	EPA 200.7	5/19/20 15:57	SXC	5/21/20 15:41	MNP	D
Sodium, Dissolved	16.6		mg/L	0.50	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:22	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	6.42		pH_Units		Field			5/18/20 12:14	BGS	M
Specific Conductance, Field	249		umhos/cm	1	Field			5/18/20 12:14	BGS	M
Temperature	15.00		Deg. C		Field			5/18/20 12:14	BGS	M

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3102941 2ND QTR 2020-3100 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3102941001	1	3100 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3102941001	2	3100 River Road, Conestoga, PA	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.				

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3102941 2ND QTR 2020-3100 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3102941001	3100 River Road, Conestoga, PA	ASTM D6919-09		
3102941001	3100 River Road, Conestoga, PA	EPA 200.7	EPA ACID	
3102941001	3100 River Road, Conestoga, PA	EPA 200.7	EPA TRMD	
3102941001	3100 River Road, Conestoga, PA	EPA 300.0		
3102941001	3100 River Road, Conestoga, PA	EPA 410.4		
3102941001	3100 River Road, Conestoga, PA	EPA 420.4	420.4/9066	
3102941001	3100 River Road, Conestoga, PA	Field		
3102941001	3100 River Road, Conestoga, PA	S2540C-11		
3102941001	3100 River Road, Conestoga, PA	S4500HB-11		
3102941001	3100 River Road, Conestoga, PA	SM2130B-2011		
3102941001	3100 River Road, Conestoga, PA	SM2320B-2011		
3102941001	3100 River Road, Conestoga, PA	SM2510B-2011		
3102941001	3100 River Road, Conestoga, PA	SM5310B-2011		
3102941001	3100 River Road, Conestoga, PA	SW846 8260B		
3102941001	3100 River Road, Conestoga, PA	SW846 9020B		

ALS Environmental

34 Dogwood Lane • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

3102941

1 of 1

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

(Completed by Receiving Lab)

Client Name: LCSWMA - Larry Kirchner

Address: 3100 River Road
Conestoga, PA 17516

Contact: Larry Kirchner

Phone#: (717) 584-0030

Project Name/#: LCSWMA - Quarterly

Bill To: Lancaster County Solid Waste MA

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

Date Required: _____ Approved By: _____

Email? [ ] -Y _____

Fax? [ ] -Y No.: _____

Container Type	AG	AN	AN	CG	—	PL	PL	PL		
Container Size	40 ml	125 ml	250 ml	40 ml	—	250 ml	125 ml	125 ml	500 ml	500 ml
Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None

Cooler Temp: _____ Therm ID: _____

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 #:

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3	Sample/COC Comments
					Enter Number of Containers Per Sample or Field Results Below.										
1 3100RIVERRD	05/18/20	1214	G	DW	2	1	2	3	X	1	1	1	1	1	
2															
3															
4									TS	5/18/20					
5															
6															
7															
8															
9															
10															

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: _____

Project Comments:

LOGGED BY(signature): _____ DATE _____ TIME _____

REVIEWED BY(signature): _____ DATE _____ TIME _____

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] ALS	5/18/20	1633	2 [signature]	5/18/20	1555
3			4		
5			6		
7			8		
9			10		

Data Deliverables: ☐Standard ☐CLP-like ☐USACE ☐

Special Processing: USACE ☐ Navy ☐ ☐

State Samples Collected In: ☐NY ☐NJ ☒PA ☐NC ☐

Reportable to PADEP? Yes ☐ PWSID # _____

Sample Disposal: Lab ☒ Special ☐

EDDS: Format Type- _____

* G=Grab; C=Composite

**Matrix - Al=Air; DW=Drinking Water; GW=Groundwater; Ol=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

ALS

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSWMA | Work Order #: 310941 | Initials: TS | Date: 5/8/20

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? 3 VOCs		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): 5

Thermometer ID: 309

Radiological (µCi): _____

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

[1]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

Rev 1/20/2020

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

June 9, 2020

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

Certificate of Analysis

Project Name:	**CONTIGUOUS LANDOWNER-3106 RIVER RD**	Workorder:	**3104420**
Purchase Order:	**PO1000126**	Workorder ID:	**LCSWMA-Quarterly**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, May 26, 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.

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

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

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

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104420 LCSWMA-Quarterly

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3104420001	3106 River Road, Conestoga, PA	Water	5/26/2020 09:25	5/26/2020 15:33	Mr. Brian G Shade

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104420 LCSWMA-Quarterly

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 preformed 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

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104420 LCSWMA-Quarterly

Lab ID: **3104420001** Date Collected: 5/26/2020 09:25 Matrix: Water

Sample ID: **3106 River Road, Conestoga, PA** Date Received: 5/26/2020 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			5/28/20 15:49	TMP	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/28/20 15:49	TMP	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/28/20 15:49	TMP	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/28/20 15:49	TMP	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/28/20 15:49	TMP	K
trans-1,2-Dichloroethene	ND	3	ug/L	1.0	SW846 8260B			5/28/20 15:49	TMP	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			5/28/20 15:49	TMP	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			5/28/20 15:49	TMP	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			5/28/20 15:49	TMP	K
Toluene	ND		ug/L	1.0	SW846 8260B			5/28/20 15:49	TMP	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			5/28/20 15:49	TMP	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			5/28/20 15:49	TMP	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			5/28/20 15:49	TMP	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			5/28/20 15:49	TMP	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			5/28/20 15:49	TMP	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	62 - 133	SW846 8260B			5/28/20 15:49	TMP	K
4-Bromofluorobenzene (S)	93.1		%	79 - 114	SW846 8260B			5/28/20 15:49	TMP	K
Dibromofluoromethane (S)	103		%	78 - 116	SW846 8260B			5/28/20 15:49	TMP	K
Toluene-d8 (S)	89.7		%	76 - 127	SW846 8260B			5/28/20 15:49	TMP	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	15		mg/L	5	SM2320B-2011			5/29/20 15:52	R2B	C
Alkalinity, Total	15	1	mg/L	5	SM2320B-2011			5/29/20 15:52	R2B	A
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			6/1/20 03:55	JXL	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			5/29/20 01:41	JAM	B
Chloride	110		mg/L	2.0	EPA 300.0			5/27/20 06:52	MBW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			5/27/20 06:52	MBW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			6/3/20 16:09	PAG	I
Nitrate-N	12.4		mg/L	0.20	EPA 300.0			5/27/20 06:52	MBW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			5/27/20 06:52	MBW	C
pH	5.88	2	pH_Units		S4500HB-11			5/29/20 15:52	R2B	C
Phenolics	ND		mg/L	0.005	EPA 420.4	5/27/20 20:00	VXF	5/28/20 15:23	C_D	H
Specific Conductance	490		umhos/cm	1	SM2510B-2011			5/29/20 15:52	R2B	C
Sulfate	6.2		mg/L	2.0	EPA 300.0			5/27/20 06:52	MBW	C

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104420 LCSWMA-Quarterly

Lab ID: **3104420001** Date Collected: 5/26/2020 09:25 Matrix: Water
Sample ID: **3106 River Road, Conestoga, PA** Date Received: 5/26/2020 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Total Dissolved Solids	364		mg/L	25	S2540C-11			5/28/20 13:11	KXH	C
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			6/8/20 18:38	PAG	F
Turbidity	0.35		NTU	0.10	SM2130B-2011			5/28/20 07:39	R2B	C
METALS										
Calcium, Total	20.7		mg/L	0.050	EPA 200.7	5/28/20 15:22	SXC	5/29/20 14:01	SRT	D
Calcium, Dissolved	21.1		mg/L	0.10	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:04	SRT	E
Iron, Total	0.094		mg/L	0.030	EPA 200.7	5/28/20 15:22	SXC	5/29/20 14:01	SRT	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:04	SRT	E
Magnesium, Total	14.6		mg/L	0.050	EPA 200.7	5/28/20 15:22	SXC	5/29/20 14:01	SRT	D
Magnesium, Dissolved	15.2		mg/L	0.10	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:04	SRT	E
Manganese, Total	0.051		mg/L	0.0025	EPA 200.7	5/28/20 15:22	SXC	5/29/20 14:01	SRT	D
Manganese, Dissolved	0.049		mg/L	0.0050	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:04	SRT	E
Potassium, Total	2.3		mg/L	0.25	EPA 200.7	5/28/20 15:22	SXC	5/29/20 14:01	SRT	D
Potassium, Dissolved	2.4		mg/L	0.50	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:04	SRT	E
Sodium, Total	44.7		mg/L	0.25	EPA 200.7	5/28/20 15:22	SXC	5/29/20 14:01	SRT	D
Sodium, Dissolved	47.8		mg/L	0.50	EPA 200.7	5/29/20 06:59	SRT	5/29/20 12:04	SRT	E
FIELD PARAMETERS										
pH, Field (SM4500B)	6.37		pH_Units		Field			5/26/20 09:25	BGS	N
Specific Conductance, Field	395		umhos/cm	1	Field			5/26/20 09:25	BGS	N
Temperature	15.20		Deg. C		Field			5/26/20 09:25	BGS	N

Ms. Susan J Scherer
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3104420 LCSWMA-Quarterly

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3104420001	1	3106 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3104420001	2	3106 River Road, Conestoga, PA	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.				
3104420001	3	3106 River Road, Conestoga, PA	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 123 and the control limits were 71 to 122.				

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3104420 LCSWMA-Quarterly

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3104420001	3106 River Road, Conestoga, PA	ASTM D6919-09		
3104420001	3106 River Road, Conestoga, PA	EPA 200.7	EPA ACID	
3104420001	3106 River Road, Conestoga, PA	EPA 200.7	EPA TRMD	
3104420001	3106 River Road, Conestoga, PA	EPA 300.0		
3104420001	3106 River Road, Conestoga, PA	EPA 410.4		
3104420001	3106 River Road, Conestoga, PA	EPA 420.4	420.4/9066	
3104420001	3106 River Road, Conestoga, PA	Field		
3104420001	3106 River Road, Conestoga, PA	S2540C-11		
3104420001	3106 River Road, Conestoga, PA	S4500HB-11		
3104420001	3106 River Road, Conestoga, PA	SM2130B-2011		
3104420001	3106 River Road, Conestoga, PA	SM2320B-2011		
3104420001	3106 River Road, Conestoga, PA	SM2510B-2011		
3104420001	3106 River Road, Conestoga, PA	SM5310B-2011		
3104420001	3106 River Road, Conestoga, PA	SW846 8260B		
3104420001	3106 River Road, Conestoga, PA	SW846 9020B		

ALS Environmental

301 Fulling Mill Road • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

COC #:

ALS Quo

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

Client Name: LCSWMA - Aaron Fry

Address: 3106 River Road
Conestoga, PA 17516

Contact: Aaron Fry

Phone#: (717) 669-6831

Project Name/#: LCSWMA - Quarterly

Bill To: LCSWMA - Aaron Fry

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

Date Required: _____ Approved By: _____

Email? [ ] -Y

Fax? [ ] -Y No.: _____

Container Type	AG	AN	AN	CG	—	PL	PL	PL	PL	PL
Container Size	40 ml	125 ml	250 ml	40 ml	—	250 ml	125 ml	125 ml	500 ml	500 ml
Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F. Td, SpC	Alkalinity, HCO3
					Enter Number of Containers Per Sample or Field Results Below.									
1 3106RIVERRD	05/26/20	0925	G	DW	2	1	2	23	X	1	1	1	1	1
2								W4:27-20						
3														
4														
5														
6														
7														
8														
9														
10														

Cooler Temp: 6°C 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

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: _____

Project Comments:

LOGGED BY(signature): Date: Time:

REVIEWED BY(signature): Date: Time:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] DEV AGE	5-26-20	1523	2 COM	5/26/20	1537
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE

Special Processing: USACE [ ] Navy [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC

Reportable to PADEP? Yes [ ]

PWSID #

Sample Disposal: Lab [X] 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:	Work Order #:	Initials:	Date:
LCSWMA	3104420		05272020

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 #:	1							
Temperature (°C):	6							
Thermometer ID:	30A							
Radiological (µCi):								

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

See ccc

[1]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

Rev 1/20/2020

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

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:	**CONTIGUOUS LANDOWNER-3125 RIVER RD**	Workorder:	**3104064**
Purchase Order:	**PO1000126**	Workorder ID:	**CONTIGUOUS LANDOWNER-3125 RIVE**

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.

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

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

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

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:	**CONTIGUOUS LANDOWNER-3125 RIVER RD**	Workorder:	**3104064**
Purchase Order:	**PO1000126**	Workorder ID:	**CONTIGUOUS LANDOWNER-3125 RIVE**

Dear Mr. Brown:

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

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

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

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104064 CONTIGUOUS LANDOWNER-3125 RIVE

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3104064001	3125 River Road, Conestoga, PA	Water	5/22/2020 11:41	5/22/2020 13:53	Mr. Brian G Shade

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3104064 CONTIGUOUS LANDOWNER-3125 RIVE

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 preformed 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

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104064 CONTIGUOUS LANDOWNER-3125 RIVE

Lab ID: **3104064001** Date Collected: 5/22/2020 11:41 Matrix: Water

Sample ID: **3125 River Road, Conestoga, PA** Date Received: 5/22/2020 13:53

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:51	DPC	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 17:51	DPC	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 17:51	DPC	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:51	DPC	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:51	DPC	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:51	DPC	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:51	DPC	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			5/27/20 17:51	DPC	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:51	DPC	K
Toluene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:51	DPC	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			5/27/20 17:51	DPC	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			5/27/20 17:51	DPC	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			5/27/20 17:51	DPC	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			5/27/20 17:51	DPC	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			5/27/20 17:51	DPC	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	62 - 133	SW846 8260B			5/27/20 17:51	DPC	K
4-Bromofluorobenzene (S)	105		%	79 - 114	SW846 8260B			5/27/20 17:51	DPC	K
Dibromofluoromethane (S)	101		%	78 - 116	SW846 8260B			5/27/20 17:51	DPC	K
Toluene-d8 (S)	94.4		%	76 - 127	SW846 8260B			5/27/20 17:51	DPC	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	133		mg/L	5	SM2320B-2011			5/27/20 21:30	R2B	C
Alkalinity, Total	133	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 06:02	JXL	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			5/29/20 00:58	JAM	B
Chloride	121		mg/L	2.0	EPA 300.0			5/23/20 14:09	MBW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			5/23/20 14:09	MBW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			6/3/20 14:08	PAG	I
Nitrate-N	5.9		mg/L	0.20	EPA 300.0			5/23/20 14:09	MBW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			5/23/20 14:09	MBW	C
pH	7.23	2	pH_Units		S4500HB-11			5/27/20 21:30	R2B	C
Phenolics	ND		mg/L	0.005	EPA 420.4	5/26/20 12:30	VXF	5/26/20 11:17	VXF	H
Specific Conductance	752		umhos/cm	1	SM2510B-2011			5/27/20 21:30	R2B	C
Sulfate	15.2		mg/L	2.0	EPA 300.0			5/23/20 14:09	MBW	C

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104064 CONTIGUOUS LANDOWNER-3125 RIVE

Lab ID: **3104064001** Date Collected: 5/22/2020 11:41 Matrix: Water
Sample ID: **3125 River Road, Conestoga, PA** Date Received: 5/22/2020 13:53

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Total Dissolved Solids	438		mg/L	25	S2540C-11			5/27/20 14:19	KXH	C
Total Organic Carbon (TOC)	0.65	3	mg/L	0.50	SM5310B-2011			6/3/20 14:19	PAG	F
Turbidity	ND		NTU	0.10	SM2130B-2011			5/23/20 07:36	R2B	C
METALS										
Calcium, Total	65.3		mg/L	0.050	EPA 200.7	5/26/20 16:32	SXC	5/27/20 16:02	MNP	D
Calcium, Dissolved	73.6		mg/L	0.10	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:59	MNP	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	5/26/20 16:32	SXC	5/27/20 16:02	MNP	D
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:59	MNP	E
Magnesium, Total	11.5		mg/L	0.050	EPA 200.7	5/26/20 16:32	SXC	5/27/20 16:02	MNP	D
Magnesium, Dissolved	13.1		mg/L	0.10	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:59	MNP	E
Manganese, Total	0.053		mg/L	0.0025	EPA 200.7	5/26/20 16:32	SXC	5/27/20 16:02	MNP	D
Manganese, Dissolved	0.059		mg/L	0.0050	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:59	MNP	E
Potassium, Total	7.2		mg/L	0.25	EPA 200.7	5/26/20 16:32	SXC	5/27/20 16:02	MNP	D
Potassium, Dissolved	7.7		mg/L	0.50	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:59	MNP	E
Sodium, Total	54.7		mg/L	0.25	EPA 200.7	5/26/20 16:32	SXC	5/27/20 16:02	MNP	D
Sodium, Dissolved	60.0		mg/L	0.50	EPA 200.7	5/26/20 07:45	SRT	5/26/20 13:59	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	7.28		pH_Units		Field			5/22/20 11:41	BGS	N
Specific Conductance, Field	759		umhos/cm	1	Field			5/22/20 11:41	BGS	N
Temperature	16.10		Deg. C		Field			5/22/20 11:41	BGS	N

Susan J. Scherer
Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3104064 CONTIGUOUS LANDOWNER-3125 RIVE

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3104064001	1	3125 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3104064001	2	3125 River Road, Conestoga, PA	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.				
3104064001	3	3125 River Road, Conestoga, PA	SM5310B-2011	Total Organic Carbon (TOC)
The QC sample type CCV for method 415.1/9060/5310B was outside the control limits for the analyte Total Organic Carbon. The % Recovery was reported as 112 and the control limits were 90 to 110.				

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3104064 CONTIGUOUS LANDOWNER-3125 RIVE

Lab ID	Sample ID	Analysis Method	Prep Method	Leachate Method
3104064001	3125 River Road, Conestoga, PA	ASTM D6919-09		
3104064001	3125 River Road, Conestoga, PA	EPA 200.7	EPA ACID	
3104064001	3125 River Road, Conestoga, PA	EPA 200.7	EPA TRMD	
3104064001	3125 River Road, Conestoga, PA	EPA 300.0		
3104064001	3125 River Road, Conestoga, PA	EPA 410.4		
3104064001	3125 River Road, Conestoga, PA	EPA 420.4	420.4/9066	
3104064001	3125 River Road, Conestoga, PA	Field		
3104064001	3125 River Road, Conestoga, PA	S2540C-11		
3104064001	3125 River Road, Conestoga, PA	S4500HB-11		
3104064001	3125 River Road, Conestoga, PA	SM2130B-2011		
3104064001	3125 River Road, Conestoga, PA	SM2320B-2011		
3104064001	3125 River Road, Conestoga, PA	SM2510B-2011		
3104064001	3125 River Road, Conestoga, PA	SM5310B-2011		
3104064001	3125 River Road, Conestoga, PA	SW846 8260B		
3104064001	3125 River Road, Conestoga, PA	SW846 9020B		

ALS Environmental

301 Fulling Mill Road • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

3104064

1 of 1

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

(Filled by Receiving Lab)

Client Name: LCSWMA - Christian C. Beck

Address: 3125 River Road
Conestoga, PA 17516

Contact: Dan Brown

Phone#: (717) 871-0448

Project Name/#: LCSWMA - Quarterly

Bill To: Lancaster County Solid Waste MA

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

Date Required: _____ Approved By: _____

Email? [ ] -Y _____

Fax? [ ] -Y No.: _____

Cooler Temp: 2° Therm ID: 523

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 #:

Container Type	AG	AN	AN	CG	—	PL	PL	PL	PL	
Container Size	40 ml	125 ml	250 ml	40 ml	—	250 ml	125 ml	125 ml	500 ml	500 ml
Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3	Sample/COC Comments
					Enter Number of Containers Per Sample or Field Results Below.										
1 3125RIVERRD	05/22/20	1141	G	DW	2	1	2	3 (60')	X	1	1	1	1	1	
2								60'							
3								5/22							
4															
5															
6															
7															
8															
9															
10															

ALS Field Services: [ ] Pickup [ ] Labor [ ] Composite_Sampling [ ] Rental_Equipment [ ] Other: _____

Project Comments:

LOGGED BY(signature): DATE TAT

REVIEWED BY(signature): DATE TAT

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] ALS	5-22-20	1353	2 [signature]	5/22/20	1753
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Special Processing: USACE [ ] Navy [ ] [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ]

Reportable to PADEP? Yes [ ]

PWSID # _____

Sample Disposal: Lab [X] Special [ ]

EDDS: Format Type- _____

* G=Grab; C=Composite **Matrix - Ai=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: LCSWMA | Work Order #: 3104069 | Initials: GDM | Date: 5/22/20

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? Added GDM 5/22		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? pH 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: 503

Radiological (µCi): _____

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

[1]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.

Rev 1/20/2020