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June 25, 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: 1st 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 1st Quarter 2020 data on April 8, 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, laboratory reports, and data export excel file for uploading the data into your LandLinks Access database.

Leachate:

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

- LCSWMA continues to monitor the Form 50 parameters from location FFLEINFS. This location is the leachate collection system for the Frey Farm Landfill and represents "raw" leachate characteristics for the facility, as collected from the six (6) landfill cells.
- As indicated on the Form 50, the primary leachate collection and secondary detection systems encompass approximately 93 acres of drainage area.

FREY FARM LANDFILL CONESTOGA, PA



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- 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 1st Quarter 2020 Frey Farm Landfill (FFLF) secondary flow was noted at 3.37 gallons per day per acre (gpdpa); which is below the regulatory limit of 100 gpdpa. The 1st Quarter 2020 secondary flow was 1.09% 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,

Daniela. Brown

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

June 15, 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 First 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 First Quarter 2020 water quality monitoring results for Frey Farm Landfill (FFLF). As part of this evaluation, ARM reviewed the historic and First 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 and leachate samples collected by LCSWMA during the First Quarter 2020 were analyzed for quarterly Form 19, Form 50, and Form 52 parameters, as applicable. The following narrative provides a summary of noteworthy observations of the results for the First 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 (First Quarter 2020).

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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 First 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 First 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 volatile organic compounds (VOCs), chemical oxygen demand (COD), and total phenolics because of a historical lack of detections in MP-2. 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 First Quarter 2020. The attached **Table 2** summarizes the background exceedances in the downgradient Form 52 wells during the First 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

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sampling events to evaluate the presence of any positive or negative trends for the parameters of concern.

Individual Form 19 Well Summary

- <u>MP-2</u> No parameters are above the statistical background level in this upgradient well for the First 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 steady long-term trend. All other Form 19 analytical parameters appear to be stable and within historical concentration ranges.
- <u>MP-5</u> Parameters above background in this well include calcium, chloride, magnesium, sodium, SpC, sulfate, 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.
- <u>MP-15</u> Iron, magnesium, and turbidity were observed above background in this well. Iron and turbidity levels do not appear to have a consistent trend and fluctuate between values above background level and below lab detection limits with no discernible pattern. 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.
- <u>MP-16</u> Ammonia-N, chloride, magnesium, sodium, sulfate, and TOC 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.
- <u>MP-17</u> Parameters observed above background in this well include calcium, chloride, magnesium, manganese, sodium, SpC, sulfate, TDS, and TOC. 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 appeared to stabilize. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.7 unit higher than background.
- <u>MP-18</u> 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 historical levels. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.4 unit higher, on average.

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- <u>MP-19</u> Chloride and TOC 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 1.4 units higher, on average.
- <u>MP-25</u> Chloride, magnesium, sodium, and TOC 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 1.7 units higher than background.
- <u>MP-28</u> Parameters observed above background in this well include chloride, magnesium, and 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.
- <u>MP-29</u> Chloride and sodium levels were observed above background in this well. Chloride appears to fluctuate between 20-160 mg/L in a seasonal pattern, but there does not appear to be a long-term increasing or decreasing trend. Sodium levels appear to mimic the chloride fluctuation pattern between approximately 8-45 mg/L. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.4 unit higher, on average.
- <u>MP-2DW</u> Parameters observed above background in this well include calcium, chloride, iron, magnesium, manganese, sodium, SpC, TDS, and turbidity. These parameter concentrations appear to be increasing between the Third Quarter 2017 and Fourth Quarter 2018 sampling events. They generally appear to 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 2.0 units higher, on average.
- <u>MP-2SW</u> Parameters observed above background in this well include chloride, iron, sodium, TOC, and turbidity. 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.
- <u>MP-31</u> 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.
- <u>MP-32</u> 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.

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• <u>MP-33</u> – Parameters observed above background in this well include ammonia-N, chloride, iron, manganese, 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.

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- <u>MP-3A</u> 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 1.0 unit higher than background.
- <u>MP-4A</u> Parameters observed above background in this well include alkalinity (bicarbonate and total), calcium, chloride, magnesium, sodium, SpC, and TDS. 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.
- <u>MP-26R</u> Parameters observed above background in this well include calcium, chloride, magnesium, manganese, potassium, sodium, SpC, sulfate, TDS, and TOC. 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.
- <u>MP-30R</u> Parameters observed above background in this well include chloride, magnesium, manganese, sodium, SpC, and TDS. These parameter concentrations appear to be fluctuating across a relatively wide range of values with no apparent long-term trends. 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 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.

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Form 50 Leachate Zone Summary

ARM reviewed the historic and First 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).

Leachate flows in the primary and secondary zones appear to be generally stable over time apart from occasional fluctuations. 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.

Form 50 VOC Detections and Apparent Trends

2-butanone (MEK) and acetone were observed in FFLEINS in the First Quarter 2020 and have been historically present in the primary leachate samples. These VOC concentrations do not appear to be increasing over time.

1,1-dichloroethane, 1,4-dichlorobenzene, acetone, ethylbenzene, and xylenes were observed in FFMH01SS and have historically been present at low levels. 1,4-dichlorobenzene levels appear to be very slowly increasing over time, and the other noted VOC concentrations appear to be stable or decreasing.

Acetone was observed in FFMH03SS and has historically been present at levels between approximately 10-30 μ g/l, although concentrations do not appear to be increasing over time.

Other Form 50 Detections and Apparent Trends

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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

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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 First Quarter 2020, the analyses for the secondary leachate samples collected from FFMH03SS and FFMH05SS resulted in MCL exceedances for nitrate-N. All downgradient wells should therefore be sampled for Subtitle D Form 19 parameters at the next annual sampling event.

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Form 52 Contiguous Private Wells Summary

ARM reviewed the historic and First Quarter 2020 groundwater monitoring results for ten (10) contiguous privately-owned wells. Samples collected from these wells were analyzed for Form 52 parameters. The attached **Table 2** summarizes the background exceedances in the downgradient Form 52 wells during the First 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.

• <u>3044RIVERRD</u> – Parameters observed above background in this well include ammonia-N, total and dissolved magnesium, and dissolved potassium. Ammonia-N has been detected sporadically in this well since 2014 but does not appear to be increasing consistently over time. Magnesium and potassium levels appear 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.

Methylene chloride was detected at 1.2 μ g/L in this well during the Fourth Quarter 2019 sampling event. Because this was the first historical detection at 3044RIVERRD and this parameter was not detected in First Quarter 2020 sampling results, ARM suspects that the Fourth Quarter 2019 detection was anomalous.

- <u>3052RIVERRD</u> No parameters were observed above background in this well. pH appears to be slowly increasing since 2017 and is currently approximately 0.6 unit higher than background.
- <u>3056RIVERRD</u> Parameters observed above background in this well include total and dissolved magnesium and dissolved potassium. 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.
- <u>3060RIVERRD</u> Dissolved potassium was observed above background in this well but appears to be stable long-term. Turbidity was also slightly above background, but this does not appear to be a historically consistent issue in this well. pH appears to mimic the trend observed in the upgradient well at nearly identical levels, on average, while fluctuating over a slightly wider range.
- <u>3076RIVERRD</u> Parameters above background in this well include chloride, dissolved potassium, and total and dissolved sodium. Chloride and sodium levels appear to be stable and not increasing over time. Potassium levels appear to be trending toward an increase since the First Quarter 2019. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.3 unit higher, on average.
- <u>3079RIVERRD</u> Parameters above background in this well include chloride and dissolved potassium. Chloride levels fluctuate in an apparently seasonal manner but do not appear to be trending toward an increase over time. Potassium levels appear to be trending toward an



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increase since the First Quarter 2019. pH appears to be slowly increasing since 2017 and is currently approximately 1.2 units higher than background.

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- <u>3088RIVERRD</u> Parameters observed above background in this well include total and bicarbonate alkalinity, chloride, dissolved potassium, 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.
- <u>3100RIVERRD</u> Chloride was observed 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.
- <u>3106RIVERRD</u> Chloride, magnesium, and sodium were observed above background in this well. Concentrations of all these parameters appear to be trending toward an increase since the First Quarter 2019. Since late 2015, pH appears to mimic the trend observed in the upgradient well at levels approximately 1.1 units higher, on average.
- <u>3125RIVERRD</u> Parameters observed above background in this well include total and bicarbonate alkalinity, chloride, dissolved potassium, 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. Sodium, SpC, and TDS levels appear to be decreasing since the Second Quarter 2018. Total and bicarbonate alkalinity and potassium levels began to increase during the Second, Third, and Fourth Quarters 2018 and remain elevated above background levels. pH also appears to be increasing since early 2018 and is currently approximately 2.2 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.

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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 A. Brandon

Ryan Brandon Project Hydrogeologist II

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

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Enclosed: Tables 1-2 Attachments 1-2

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TABLES

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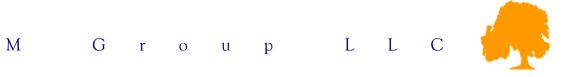


Table 1. LCSWMA Frey Farm Landfill Form 19 Groundwater Monitoring Well Background Standard Comparisons - 1st Quarter 2020

Parameter	Background Standard	Units	FFMP002W	FFMP005W	FFMP015W	FFMP016W	FFMP017W	FFMP018W	FFMP019W	FFMP025W	FFMP028W	FFMP029W	FFMP02DW	FFMP02SW	FFMP031W	FFMP032W	FFMP033W	FFMP03AW	FFMP04AW	FFMP26RW	FFMP30RW
1,1,1-TRICHLOROETHANE	1*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-DICHLOROETHANE	1*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-DICHLOROETHENE	1*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-DIBROMOETHANE (EDB) (ETHYLENE DIBROMIDE)	1*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-DICHLOROETHANE	1*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ALKALINITY	143.8	mg/L	< 5	54	20	38	70	22	64	36	27	13	119	14	64	68	45	18	196	65	28
AMMONIA-NITROGEN	0.308	mg/L	< 0.10	< 0.10	0.18	0.31	0.25	0.13	< 0.10	0.26	< 0.10	< 0.10	< 0.10	0.10	0.10	0.51	0.68	0.19	< 0.10	< 0.10	0.10
BENZENE	1*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
BICARBONATE	137.8	mg/L	< 5	54	20	38	70	22	64	36	27	13	119	14	64	68	45	18	196	65	28
CALCIUM, TOTAL	73.1	mg/L	20.8	83.4	19.6	41.8	114	33.9	60.2	40.6	38.9	14.7	118	16.9	40.6	15.5	25.6	19.2	157	75.3	33.3
CHLORIDE	30.81	mg/L	22.5	203	23.7	101	387	106	82.8	96.4	88.3	66.7	299	55.8	24.6	22.7	40.8	27.3	306	127	163
cis 1,2-DICHLOROETHENE	1*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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
ETHYLBENZENE	1*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
FLUORIDE	0.5	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	0.30	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
IRON, TOTAL	0.181	mg/L	0.090	< 0.060	0.46	0.14	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	0.94	1.1	4.2	17.5	6.1	< 0.060	< 0.060	< 0.060	< 0.060
MAGNESIUM, TOTAL	10.13	mg/L	8.6	20.8	18.9	18.1	42.2	15.4	5.7	19.5	17.8	9.8	18.7	6.6	3.9	5.3	9.4	13.4	26.2	14.8	15.8
MANGANESE, TOTAL	0.329	mg/L	0.25	0.090	0.050	0.0062	1.1	0.24	< 0.0056	< 0.0056	0.0080	0.030	0.48	0.010	0.30	0.65	0.49	0.28	0.30	1.0	2.0
METHYLENE CHLORIDE	1*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
NITRATE-NITROGEN	28.7	mg/L	21.3	2.0	27.8	2.7	1.5	4.5	0.22	3.0	17.1	3.9	10.2	15.1	< 0.20	< 0.20	11.5	21.1	0.42	2.3	5.1
POTASSIUM, TOTAL	10.28	mg/L	1.4	3.5	2.5	3.3	10.0	5.7	0.98	3.3	2.4	2.3	2.0	5.9	1.4	1.3	1.8	1.5	2.5	10.6	4.8
SODIUM, TOTAL	22.2	mg/L	14.7	59.7	19.8	33.9	105	32.4	10.7	34.5	28.2	23.3	111	49.6	11.2	14	14.5	12.8	88.7	48.6	79.8
SPEC. COND., LAB	568.5	µmho/cm	270	954	382	550	1,540	517	444	536	543	295	1,270	409	282	184	332	294	1,420	789	713
SULFATE	59.1	mg/L	12.0	84.7	30.0	62.5	98.2	41.8	15.4	57.0	26.2	7.0	31.1	28.9	40.8	< 2.0	6.8	3.3	46.5	119	25.8
TDS (TOTAL DISSOLVED SOLIDS)	335.4	mg/L	224	640	210	252	760	314	252	290	294	144	866	108	328	78	86	222	944	500	696
TETRACHLOROETHENE	1*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TOC (TOTAL ORGANIC CARBON)	1.056	mg/L	< 0.50	1.9	1.0	2.0	3.3	0.97	1.4	1.7	0.87	< 0.50	0.68	2.9	< 0.50	0.53	< 0.50	< 0.50	0.80	2.5	0.76
TOLUENE	1*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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
trans 1,2-DICHLOROETHENE	1*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TRICHLOROETHENE	1*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TURBIDITY	1.704	NTU	< 0.10	< 0.10	2.3	1.43	0.26	< 0.10	< 0.10	0.12	0.13	0.3	8.69	25.9	19.1	118	13.7	< 0.10	0.51	0.32	0.75
VINYL CHLORIDE	1*	μg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
XYLENES (TOTAL)	3*	μg/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

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.

FFLF 3044 RIVER 3052 RIVER 3056 RIVER 3060 RIVER 3076 RIVER 3079 RIVER 3088 RIVER Parameter Background Units RD RD RD RD RD RD RD Standard ALKALINITY 145.8 mg/L 8 8 13 10 36 152 0.67 0.12 0.1 0.1 AMMONIA-NITROGEN 0.313 mg/L 143.2 10 36 152 **BICARBONATE ALKALINITY** 8 8 13 mg/L 28.22 16.3 0.3 CALCIUM, DISSOLVED mg/L 16.0 11.3 10.7 16.0 10.6 73.74 14.2 17.0 10.9 9.4 14.0 9.2 CALCIUM, TOTAL mg/L 0.10 23.6 23.3 25.4 22.3 48.5 33.4 243 CHLORIDE 30.97 mg/L 0.185 0.030 IRON, TOTAL mg/L MAGNESIUM, DISSOLVED 10.84 mg/L 12.5 9.0 12.2 10.8 9.3 6.0 0.12 8.5 11 9.5 12.1 10.1 5.2 0.06 MAGNESIUM, TOTAL 10.13 mg/L 0.531 0.030 0.030 0.180 MANGANESE, DISSOLVED mg/L 0.070 0.100 0.160 0.329 0.030 0.070 0.110 MANGANESE, TOTAL 0.030 0.160 0.150 mg/L NITRATE-NITROGEN 28.7 mg/L 19.3 18.3 18.8 15.3 10.1 6.6 S.U. 7.75 6.36 5.40 5.89 6.35 NA 6.19 6.90 pH-LAB 1.685 2.0 3.4 4.1 3.5 2.6 POTASSIUM, DISSOLVED mg/L 1.5 1.7 3.1 POTASSIUM, TOTAL 10.28 1.6 1.6 1.6 2.0 1.6 2.5 mg/L 224 SODIUM, DISSOLVED 21.81 mg/L 10.5 7.6 8.1 8.3 25.3 14 9.7 7.6 7.2 255 22.2 8.1 24.1 14 SODIUM, TOTAL mg/L 568.5 223 222 237 229 278 187 1,090 SPEC. COND., LAB µmhos/cm 59.1 2.0 10.6 12.7 11.9 SULFATE mg/L 335.4 130 202 502 **FDS (TOT. DISSOLVED SOLIDS)** mg/L 90 106 152 56 1.056 FOC (TOTAL ORGANIC CARBON) mg/L 0.19 1.78 0.25 TURBIDITY 1.704 NTU

Table 2. LCSWMA Frey Farm Landfill Form 52 Groundwater Monitoring Well Background Standard Comparisons - 1st Quarter 2020

Notes:

Blank cells indicate parameter not detected by laboratory.

Shaded text indicates exceedance of a FFLF statistical background standard.

3100 RIVER	3106 RIVER	3125 RIVER
RD	RD	RD
KD	KD	KD
15	16	167
0.1	0.12	
15	16	167
18.9	18.0	15.00
20.1	24.4	19.50
50.8	122	120
	0.060	
7.2	6.8	3.0
7.6	16.2	2.7
0.0088	0.0081	0.010
0.0090	0.040	0.010
4.2	14.2	5.9
6.48	6.54	7.84
1.1	0.9	24.6
1.3	2.1	36.9
16.7	16.4	117
18.5	58	133
253	537	757
10.7	6.2	16.6
162	304	420
		0.66
	1.12	

ATTACHMENT 1

BACKGROUND UPPER PREDICTION LIMITS



R А

M G r o u p L L C

Attachment 1 Page 1 of 1

	LCSWMA Frey Farm	1 Landfill	
1st Quarter 20	20 - Background Uppe	r Prediction Limits (MP-2)	
Parameter	Distribution	Upper Prediction Limit	Unit
1,1,1-Trichloroethane	NA		μg/L
1,1-Dichloroethane	NA	1*	μg/L
1,1-Dichloroethene	NA	1*	μg/L
1,2-Dibromoethane	NA	1*	μg/L
1,2-Dichloroethane	NA	1*	μg/L
Alkalinity	No Distribution	143.8	mg/L
Ammonia-Nitrogen	Normal	0.308	mg/L
Benzene	NA	1*	μg/L
Bicarbonate Alkalinity	No Distribution	137.8	mg/L
Calcium, Total	No Distribution	73.1	mg/L
Chloride	Normal	30.81	mg/L
Cis 1,2-Dichloroethene	NA	1*	μg/L
Chemical Oxygen Demand	NA	15*	mg/L
Ethylbenzene	NA	1*	μg/L
Fluoride	No Distribution	0.50	mg/L
Iron, Total	Lognormal	0.181	mg/L
Magnesium, Total	Normal	10.13	mg/L
Manganese, Total	Lognormal	0.329	mg/L
Methylene Chloride	NA	1*	μg/L
Nitrate-Nitrogen	No Distribution	28.7	mg/L
pH-Lab	NA	None**	S.U.
Potassium, Total	No Distribution	10.28	mg/L
Sodium, Total	No Distribution	22.2	mg/L
Spec. Cond., Lab	No Distribution	568.5	µmhos/cm
Sulfate	No Distribution	59.1	mg/L
Total Dissolved Solids	Normal	335.4	mg/L
Tetrachloroethene	NA	1*	μg/L
Total Organic Carbon	Normal	1.056	mg/L
Toluene	NA	1*	μg/L
Total Phenolics	NA	0.005*	mg/L
Trans 1,2-Dichloroethene	NA	1*	μg/L
Trichloroethene	NA	1*	μg/L
Turbidity	Lognormal	1.704	NTU
Vinyl Chloride	NA	1*	μg/L
Total Xylenes	NA	3*	μg/L

Notes:

"NA" denotes parameter not detected or not enough detections in MP-2 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



M G r o u p L L C

	А	В	С	D	E	F	G	Н		J	K	L
1				•	Statistics for	or Data Sets	with Non-De	etects				
2			cted Options									
3	Da	te/Time of C	omputation	ProUCL 5.1	6/3/2020 10:	56:06 AM						
4			From File	MP-2 ProUC	CL Entry 20Q	1.xls						
5		Fu	II Precision	OFF								
6		Confidence	Coefficient	95%								
7			Coverage	95%								
8	Different or	Future K OI	oservations	1								
9	Number	of Bootstrap	Operations	2000								
10												
11	1,1,1-TRIC	HLOROETH	IANE (ug/L)									
12												
13						General	Statistics					
14			Total	Number of C	bservations	45			Number	of Missing C	bservations	0
15			Numbe	r of Distinct C	bservations	1						
16				Numbe	er of Detects	0				Number of I	Non-Detects	45
17			N	umber of Dist	tinct Detects	0			Numbe	er of Distinct I	Non-Detects	1
17				Mini	mum Detect	N/A				Minimum	Non-Detect	1
10				Maxi	mum Detect	N/A				Maximum	Non-Detect	1
				Varian	ce Detected	N/A				Percent I	Non-Detects	100%
20				Ме	an Detected	N/A				Ş	SD Detected	N/A
21			Mean	of Detected L	ogged Data	N/A			SD	of Detected L	ogged Data	N/A
22												
23		War	nina: All obs	ervations are	Non-Detect	s (NDs). the	erefore all sta	tistics and e	stimates sh	ould also be	NDs!	
24 25			-	e mean, UCL								
25				ecide to use).
20												<u> </u>
27			Th	e data set for	r variable 1,1	,1-TRICHL	OROETHAN	E (ug/L) was	not proces	sed!		
20												
30												
31	1,1-DICHL	OROETHAN	IE (ug/L)									
32												
33						General	Statistics					
34			Total	Number of C	bservations	45			Number	of Missing C	bservations	0
35			Numbe	r of Distinct C	bservations	1						
36				Numbe	er of Detects	0				Number of I	Non-Detects	45
37			N	umber of Dist	tinct Detects	0			Numbe	er of Distinct I	Non-Detects	1
37				Mini	mum Detect	N/A				Minimum	Non-Detect	1
39				Maxi	mum Detect	N/A				Maximum	Non-Detect	1
<u> </u>				Varian	ce Detected	N/A					Non-Detects	100%
					an Detected	N/A					SD Detected	N/A
41			Mean	of Detected L		N/A			SD	of Detected L		N/A
42												
43		War	ning: All obs	ervations are	Non-Detect	s (NDs). the	erefore all sta	tistics and e	stimates sh	ould also be	NDs!	
44				e mean, UCL								
45	-	=		ecide to use).
46									and the second second		.,	r -
47			т	he data set f	or variable 1	.1-DICHI O		(uo/L) was r	ot processe	d		
48						,. 2101120		(-9,-) 1001				
49												
50												

	A B C D E	F	G	Н	1		J		К	т	1
51	1,1-DICHLOROETHENE (ug/L)	I	u	11			5		K	_	<u> </u>
52											
53		General	Statistics								
54	Total Number of Observations	45			Num	ber of	Missing	Obse	rvations	s 0	1
55	Number of Distinct Observations	1								-	
56	Number of Detects	0				N	umber o	f Non-	-Detects	s 4	5
57	Number of Distinct Detects	0		Number of Distinct Non-Detects							
58	Minimum Detect	N/A					Minimu	m Nor	n-Detec	:t 1	
59	Maximum Detect	N/A					Maximu	m Nor	n-Detec	:t 1	
60	Variance Detected	N/A					Percent	t Non-	Detects	s 100	0%
61	Mean Detected	N/A						SD D	Detected	d N/	A
62	Mean of Detected Logged Data	N/A				SD of [Detected	Logg	ed Data	a N/	A
63											
64	Warning: All observations are Non-Detect	s (NDs), the	erefore all sta	tistics and e	stimates	shoul	d also b	e NDs	s!		
65	Specifically, sample mean, UCLs, UPLs, and										
66	The Project Team may decide to use alternative si	ite specific	alues to esti	mate enviro	nmental	param	eters (e.	.g., El	PC, BT	∨) .	
67											
68	The data set for variable 1	,1-DICHLO	ROETHENE	(ug/L) was i	not proce	ssed!					
69											
70											
70	1,2-DIBROMOETHANE (ug/L)										
72											
73		General	Statistics								
74	Total Number of Observations	45			Num	ber of	Missing	Obse	rvations	s 0)
75	Number of Distinct Observations	1								-	
76	Number of Detects	0				N	umber o	f Non-	Detects	s 45	5
77	Number of Distinct Detects	0			Nu	mber o	f Distinc	t Non-	Detects	s 1	
78	Minimum Detect	N/A					Minimu	m Nor	n-Detec	:t 1	
79	Maximum Detect	N/A					Maximu	m Nor	n-Detec	t 1	
80	Variance Detected	N/A					Percen	t Non-	Detects	s 100	0%
81	Mean Detected	N/A						SD D	Detected	d N/	A
82	Mean of Detected Logged Data	N/A			:	SD of [Detected	Logg	ed Data	a N/	A
83											
84	Warning: All observations are Non-Detect	s (NDs), the	erefore all sta	tistics and e	stimates	shoul	d also b	e NDs	s!		
85	Specifically, sample mean, UCLs, UPLs, and	d other stati	stics are also	NDs lying	below the	e large	st detec	tion li	mit!		
86	The Project Team may decide to use alternative si	ite specific	alues to esti	mate enviro	nmental	param	eters (e.	.g., El	PC, BT	∨) .	
87											
88	The data set for variable 1	1,2-DIBRON		(ug/L) was n	ot proce	ssed!					
89											
90											
91	1,2-DICHLOROETHANE										
92											
92		General	Statistics								
94	Total Number of Observations	45			Num	ber of	Missing	Obse	rvation	s 0)
95	Number of Distinct Observations	1								-	
96	Number of Detects	0				N	umber o	f Non-	-Detects	s 4	5
90 97	Number of Distinct Detects	0			Nu	mber o	f Distinc	t Non-	-Detects	s 1	
97 98	Minimum Detect	N/A					Minimu	m Nor	n-Detec	:t 1	
	Maximum Detect	N/A					Maximu	m Nor	n-Detec	:t 1	
99 100	Variance Detected	N/A					Percen	t Non-	Detects	s 100	0%
100											

	A B C D E	F	G H I J K	
101	Mean Detected	N/A	SD Detected	N/A
101	Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A
102				
103	Warning: All observations are Non-Detect	s (NDs), the	refore all statistics and estimates should also be NDs!	
			stics are also NDs lying below the largest detection limit!	
105			values to estimate environmental parameters (e.g., EPC, BTV).	
106	· · ·	· ·		
107	The data set for variab	le 1.2-DICHI	LOROETHANE was not processed!	
108			•	
109				
110 111	ALKALINITY (mg/L)			
112		General	Statistics	
113	Total Number of Observations	44	Number of Missing Observations	0
114	Number of Distinct Observations	14		
115	Number of Detects	20	Number of Non-Detects	24
116	Number of Distinct Detects	14	Number of Distinct Non-Detects	1
117	Minimum Detect	5	Minimum Non-Detect	5
118	Maximum Detect		Maximum Non-Detect	5
119	Variance Detected		Percent Non-Detects	54.55%
120	Mean Detected	42.2	SD Detected	55.03
121	Mean of Detected Logged Data	2.904	SD of Detected Logged Data	1.329
122				
123	Critical Values f	or Backgrou	nd Threshold Values (BTVs)	
124	Tolerance Factor K (For UTL)	2.091	d2max (for USL)	2.906
125				
126	Norm	al GOF Tes	t on Detects Only	
127	Shapiro Wilk Test Statistic	0.725	Shapiro Wilk GOF Test	
128	5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level	
129	Lilliefors Test Statistic	0.283	Lilliefors GOF Test	
130	5% Lilliefors Critical Value	0.192	Data Not Normal at 5% Significance Level	
131	Data Not		% Significance Level	
132	<u> </u>			
133	Kaplan Meier (KM) Bac	karound Sta	tistics Assuming Normal Distribution	
134	KM Mean	21.91	KM SD	40.63
135	95% UTL95% Coverage	106.9	95% KM UPL (t)	90.98
136	90% KM Percentile (z)	73.98	95% KM Percentile (z)	88.74
137	99% KM Percentile (z)	116.4	95% KM USL	140
138				
139	DL/2 Substitution Back	ground Stati	stics Assuming Normal Distribution	
140	Mean	20.55	SD	41.69
141	95% UTL95% Coverage	107.7	95% UPL (t)	91.42
142	90% Percentile (z)	73.97	95% Percentile (z)	89.12
143	99% Percentile (z)		95% USL	141.7
144			ovided for comparisons and historical reasons	
145			·	
146	Gamma GOF	Tests on De	etected Observations Only	
147	A-D Test Statistic	1.479	Anderson-Darling GOF Test	
148	5% A-D Critical Value	0.782	Data Not Gamma Distributed at 5% Significance Leve)
149	K-S Test Statistic	0.263	Kolmogorov-Smirnov GOF	
150		5.200		

	A B C D	Е	F	G H I J K	1
151		itical Value	0.202	Data Not Gamma Distributed at 5% Significance	evel
	Data	a Not Gamr	na Distribute	ed at 5% Significance Level	
152				•	
153		Gamma	Statistics on	Detected Data Only	
154	k	k hat (MLE)	0.718	k star (bias corrected ML	E) 0.644
155		a hat (MLE)	58.77	Theta star (bias corrected ML	•
156		u hat (MLE)	28.72	nu star (bias correcte	
157	MLE Mean (bias		42.2		
158	MLE Sd (bias	,	52.6	95% Percentile of Chisquare (2ksta	r) 4.516
159		, concorou)	02.0		.,
160	G	amma ROS	Statistics us	sing Imputed Non-Detects	
161				NDs with many tied observations at multiple DLs	
162				s <1.0, especially when the sample size is small (e.g., <15-2))
163	-			yield incorrect values of UCLs and BTVs)
164				in the sample size is small.	
165			-	y be computed using gamma distribution on KM estimates	
166	For gamma distributed detected da	Minimum	0.01		in 19.19
167		-		Me	
168		Maximum	182	Medi	
169		SD	42.31		V 2.205
170		k hat (MLE)	0.18	k star (bias corrected ML	
171		a hat (MLE)	106.4	Theta star (bias corrected ML	
172		u hat (MLE)	15.87	nu star (bias correcte	
173	MLE Mean (bias	,	19.19	MLE Sd (bias correcte	·
174	95% Percentile of Chisqua		1.93	90% Percent	
175		Percentile	101.1	99% Percenti	e 221.7
176	The following statis	stics are cor	mputed usin	g Gamma ROS Statistics on Imputed Data	
177	Upper Limits u	ising Wilson	Hilferty (WI	H) and Hawkins Wixley (HW) Methods	
177 178	Upper Limits u	i sing Wilson WH	Hilferty (WI		HW
	Upper Limits us 95% Approx. Gamma UTL with 95% Coverage	-		H) and Hawkins Wixley (HW) Methods	HW 79.41
178		WH	HW	H) and Hawkins Wixley (HW) Methods	
178 179	95% Approx. Gamma UTL with 95% Coverage	WH 114.6	HW 134.2	H) and Hawkins Wixley (HW) Methods	
178 179 180	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL	WH 114.6 237.2	HW 134.2 334.6	H) and Hawkins Wixley (HW) Methods	
178 179 180 181	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti	WH 114.6 237.2	HW 134.2 334.6	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03	79.41
178 179 180 181 182	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti	WH 114.6 237.2 imates of G	HW 134.2 334.6 amma Parai	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates	79.41 //) 40.63
178 179 180 181 182 183 183	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti	WH 114.6 237.2 imates of Ga Mean (KM)	HW 134.2 334.6 amma Paran 21.91	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (Ki	79.41 /) 40.63 /) 6.285
178 179 180 181 182 183 184 185	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti	WH 114.6 237.2 imates of G Mean (KM) riance (KM)	HW 134.2 334.6 amma Parai 21.91 1651	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (KI SE of Mean (KI	79.41 1 40.63 1 6.285 1 0.286
178 179 180 181 182 183 184 185 186	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti Var	WH 114.6 237.2 imates of G Mean (KM) riance (KM) k hat (KM)	HW 134.2 334.6 amma Paran 21.91 1651 0.291	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (Ki SE of Mean (Ki k star (Ki	79.41 1) 40.63 1) 6.285 1) 0.286 1) 25.18
178 179 180 181 182 183 184 185 186 187	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti Var	WH 114.6 237.2 imates of G Mean (KM) fiance (KM) k hat (KM) hu hat (KM) ta hat (KM)	HW 134.2 334.6 amma Parai 21.91 1651 0.291 25.59	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (K SE of Mean (K k star (K nu star (K	79.41 1) 40.63 1) 6.285 1) 0.286 1) 25.18 1) 76.58
178 179 180 181 182 183 184 185 186 187 188	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti Var	WH 114.6 237.2 imates of G Mean (KM) riance (KM) k hat (KM) hu hat (KM) ta hat (KM) sentile (KM)	HW 134.2 334.6 amma Parai 21.91 1651 0.291 25.59 75.35	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (K) SE of Mean (K) k star (K) nu star (K) theta star (K)	79.41 1 40.63 1 6.285 1 0.286 1 25.18 1 76.58 1 64.97
178 179 180 181 182 183 184 185 186 187 188 189	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti Var n the 80% gamma perc	WH 114.6 237.2 imates of G Mean (KM) riance (KM) k hat (KM) hu hat (KM) ta hat (KM) sentile (KM)	HW 134.2 334.6 amma Parai 21.91 1651 0.291 25.59 75.35 33.19	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (K SE of Mean (K k star (K u star (K funu star (K 90% gamma percentile (K)	79.41 A) 40.63 A) 6.285 A) 0.286 A) 25.18 A) 76.58 A) 64.97
178 179 180 181 182 183 184 185 186 187 188 189 190	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti Var Nar 80% gamma perc 95% gamma perc	WH 114.6 237.2 imates of G Mean (KM) riance (KM) k hat (KM) hu hat (KM) ta hat (KM) ta hat (KM) centile (KM)	HW 134.2 334.6 amma Paran 21.91 1651 0.291 25.59 75.35 33.19 101.8	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (K SE of Mean (K k star (K u star (K funu star (K 90% gamma percentile (K)	79.41 A) 40.63 A) 6.285 A) 0.286 A) 25.18 A) 76.58 A) 64.97
178 179 180 181 182 183 184 185 186 187 188 189 190 191	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti Var Var 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	WH 114.6 237.2 imates of Ga Mean (KM) riance (KM) k hat (KM) hu hat (KM) ta hat (KM) ta hat (KM) centile (KM) centile (KM)	HW 134.2 334.6 amma Paran 21.91 1651 0.291 25.59 75.35 33.19 101.8	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (K SE of Mean (K SE of Mean (K k star (K nu star (K unu star (K 90% gamma percentile (K 99% gamma percentile (K	79.41 A) 40.63 A) 6.285 A) 0.286 A) 25.18 A) 76.58 A) 64.97
178 179 180 181 182 183 184 185 186 187 188 189 190 191 192	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti Var Var 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	WH 114.6 237.2 imates of Ga Mean (KM) riance (KM) k hat (KM) hu hat (KM) ta hat (KM) ta hat (KM) centile (KM) centile (KM)	HW 134.2 334.6 amma Paran 21.91 1651 0.291 25.59 75.35 33.19 101.8	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (K SE of Mean (K SE of Mean (K k star (K nu star (K nu star (K 90% gamma percentile (K 99% gamma percentile (K 99% gamma percentile (K	79.41 A) 40.63 A) 6.285 A) 0.286 A) 25.18 A) 76.58 A) 64.97
178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti Var Var 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	WH 114.6 237.2 imates of G Mean (KM) riance (KM) k hat (KM) hu hat (KM) ta hat (KM) ta hat (KM) centile (KM) centile (KM)	HW 134.2 334.6 amma Paran 21.91 1651 0.291 25.59 75.35 33.19 101.8 mputed usi hilferty (W	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (K SE of Mean (K SE of Mean (K K star (K nu star (K 100% gamma percentile (K 90% gamma percentile (K	79.41 A) 40.63 A) 6.285 A) 0.286 A) 25.18 A) 76.58 A) 64.97 A) 197.9
178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti Var Var n thet 80% gamma perc 95% gamma perc 95% gamma perc Upper Limits u	WH 114.6 237.2 imates of Ga Mean (KM) riance (KM) k hat (KM) ta hat (KM) ta hat (KM) centile (KM) centile (KM) centile (KM) tistics are co sing Wilson WH	HW 134.2 334.6 amma Paran 21.91 1651 0.291 25.59 75.35 33.19 101.8 omputed usi hilferty (Wi	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (K SE of Mean (K) K star (K) K star (K) nu star (K) theta star (K) 90% gamma percentile (K) 90% gamma percentile (K) 99% gamma percentile (K) 99% gamma percentile (K) WH	79.41 1 40.63 1 6.285 1 0.286 1 25.18 1 76.58 1 64.97 1 197.9
178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti Var Var 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	WH 114.6 237.2 imates of G Mean (KM) fiance (KM) fiance (KM) k hat (KM) ta hat (KM) ta hat (KM) ta hat (KM) ta to (HW 134.2 334.6 amma Paran 21.91 1651 0.291 25.59 75.35 33.19 101.8 omputed usi hilferty (Wi HW 90.75	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (K SE of Mean (K SE of Mean (K SE of Mean (K k star (K nu star (K 100% gamma percentile (K 90% gamma percentile (K 99% gamma percentile (K 90% gamma percentile (K	79.41 1 40.63 1 6.285 1 25.18 1 76.58 1 64.97 1 197.9 HW 65.74
178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti Var Var 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	WH 114.6 237.2 imates of Ga Mean (KM) fiance (KM) itance (KM) ta hat (KM) ta hat (KM) ta hat (KM) ta hat (KM) ta ta (KM) ta (K	HW 134.2 334.6 amma Paran 21.91 1651 0.291 25.59 75.35 33.19 101.8 omputed usi Hilferty (WI HW 90.75 62.67	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (K SE of Mean (K SE of Mean (K SE of Mean (K k star (K nu star (K 100% gamma percentile (K 90% gamma percentile (K 99% gamma percentile (K 90% gamma percentile (K	79.41 1 40.63 1 6.285 1 25.18 1 76.58 1 64.97 1 197.9 HW 65.74
178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti Var Var 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	WH 114.6 237.2 imates of G Mean (KM) riance (KM) k hat (KM) riance (KM) k hat (KM) rentile (KM) centile (KM) centile (KM) tistics are constructed sing Wilson WH 92.34 65.75 gnormal GO	HW 134.2 334.6 amma Paran 21.91 1651 0.291 25.59 75.35 33.19 101.8 omputed usi Hilferty (WI HW 90.75 62.67 F Test on D	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (K SE of Mean (K SE of Mean (K k star (K Carter of Mean (K k star (K nu star (K 100% gamma percentile (K 90% gamma percentile (K 100% gamma percentile (K	79.41 1 40.63 1 6.285 1 25.18 1 76.58 1 64.97 1 197.9 HW 65.74
178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti Var Var 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	WH 114.6 237.2 imates of G Mean (KM) iance (KM) iance (KM) ita hat (KM) ta hat (KM) ta hat (KM) centile	HW 134.2 334.6 amma Paran 21.91 1651 0.291 25.59 75.35 33.19 101.8 omputed usi Hilferty (WI HW 90.75 62.67 F Test on D 0.844	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (K SE of Mean (K SE of Mean (K K star (K nu star (K 100% gamma percentile (K 90% gamma percentile (K 90% gamma percentile (K 99% gamma percentile (K 100% gamma percentile (K	79.41 A) 40.63 A) 6.285 A) 0.286 A) 25.18 A) 76.58 A) 64.97 A) 197.9 HW 65.74 165.2
178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL Esti Var Var 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	WH 114.6 237.2 imates of G Mean (KM) riance (KM) k hat (KM) riance (KM) k hat (KM) rantile (KM) centile (KM) centile (KM) centile (KM) tistics are constructed sing Wilson WH 92.34 65.75 gnormal GO est Statistic ritical Value	HW 134.2 334.6 amma Paran 21.91 1651 0.291 25.59 75.35 33.19 101.8 omputed usi Hilferty (WI HW 90.75 62.67 F Test on D	H) and Hawkins Wixley (HW) Methods WH 95% Approx. Gamma UPL 75.03 meters using KM Estimates SD (K SE of Mean (K SE of Mean (K k star (K Carter of Mean (K k star (K nu star (K 100% gamma percentile (K 90% gamma percentile (K 100% gamma percentile (K	79.41 A) 40.63 A) 6.285 A) 0.286 A) 25.18 A) 76.58 A) 64.97 A) 197.9 HW 65.74 165.2

	A B C D E	F	G H I J K	
201	A B C D E 5% Lilliefors Critical Value	0.192	Data Not Lognormal at 5% Significance Level	L
	Data Not L	ognormal at	5% Significance Level	
202 203		•	•	
203	Background Lognormal ROS Statistics	Assuming	Lognormal Distribution Using Imputed Non-Detects	
204	Mean in Original Scale	19.61	Mean in Log Scale	0.813
205	SD in Original Scale	42.12	SD in Log Scale	2.359
200	95% UTL95% Coverage	312.7	95% BCA UTL95% Coverage	171.7
207	95% Bootstrap (%) UTL95% Coverage	177.8	95% UPL (t)	124.3
200	90% Percentile (z)	46.34	95% Percentile (z)	109.2
210	99% Percentile (z)	544.8	95% USL	2139
211				
212	Statistics using KM estimates	on Logged I	Data and Assuming Lognormal Distribution	
212	KM Mean of Logged Data	2.198	95% KM UTL (Lognormal)95% Coverage	87.1
214	KM SD of Logged Data	1.085	95% KM UPL (Lognormal)	56.99
215	95% KM Percentile Lognormal (z)	53.67	95% KM USL (Lognormal)	211
216				
217	Background DL/2 S	Statistics As	suming Lognormal Distribution	
218	Mean in Original Scale	20.55	Mean in Log Scale	1.82
219	SD in Original Scale	41.69	SD in Log Scale	1.335
220	95% UTL95% Coverage	100.6	95% UPL (t)	59.7
221	90% Percentile (z)	34.14	95% Percentile (z)	55.46
222	99% Percentile (z)	137.8	95% USL	298.8
223	DL/2 is not a Recommended Meth	od. DL/2 pro	ovided for comparisons and historical reasons.	
224				
225	Nonparametric	Distribution	Free Background Statistics	
226	Data do not fe	ollow a Disc	ernible Distribution (0.05)	
227				
228	Nonparametric Upper Limits for B	TVs(no disti	nction made between detects and nondetects)	
	Nonparametric Upper Limits for B Order of Statistic, r	TVs(no disti 44	nction made between detects and nondetects) 95% UTL with95% Coverage	182
229				182 0.895
	Order of Statistic, r	44	95% UTL with95% Coverage	
229 230	Order of Statistic, r Approx, f used to compute achieved CC	44 2.316	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL	0.895
229 230 231 232	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC	44 2.316 59	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL	0.895 143.8
229 230 231	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL	44 2.316 59 182	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL	0.895 143.8
229 230 231 232 233	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservation	44 2.316 59 182 ve estimate	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL	0.895 143.8
229 230 231 232 233 234	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV	44 2.316 59 182 ve estimate only when th	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20.	0.895 143.8
229 230 231 232 233 234 235	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa	44 2.316 59 182 ve estimate only when th titions collect	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers	0.895 143.8
229 230 231 232 233 234 235 236	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan	44 2.316 59 182 ve estimate only when th titions collect ace between	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations.	0.895 143.8
229 230 231 232 233 234 235 236 237 238 239	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh	44 2.316 59 182 ve estimate only when th titions collect ace between	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data	0.895 143.8
229 230 231 232 233 234 235 236 237 238 239	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan	44 2.316 59 182 ve estimate only when th titions collect ace between	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data	0.895 143.8
229 230 231 232 233 234 235 236 237 238 239	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh	44 2.316 59 182 ve estimate only when th titions collect ace between	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data	0.895 143.8
229 230 231 232 233 234 235 236 237 238 239 240	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh	44 2.316 59 182 ve estimate only when th titions collect ace between	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data isite observations need to be compared with the BTV. Statistics	0.895 143.8
229 230 231 232 233 234 235 236 237 238 239 240 241	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh	44 2.316 59 182 ve estimate only when th tions collect nee between hen many or	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data isite observations need to be compared with the BTV.	0.895 143.8
229 230 231 232 233 234 235 236 237 238 239 240 241 242	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservatir Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh AMMONIA-NITROGEN (mg/L)	44 2.316 59 182 ve estimate only when the tions collect the between hen many or General 45 7	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data isite observations need to be compared with the BTV. Statistics	0.895 143.8 201
229 230 231 232 233 234 235 236 237 238 239 240 241 241 242 243	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wi AMMONIA-NITROGEN (mg/L) Total Number of Observations	44 2.316 59 182 ve estimate only when the acce between then many or General 45	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data isite observations need to be compared with the BTV. Statistics	0.895 143.8 201
229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservatir Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and with AMMONIA-NITROGEN (mg/L) Total Number of Observations Number of Distinct Observations	44 2.316 59 182 ve estimate only when the tions collect the between hen many or General 45 7	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data isite observations need to be compared with the BTV. Statistics Number of Missing Observations	0.895 143.8 201
229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wf AMMONIA-NITROGEN (mg/L) Total Number of Observations Number of Distinct Observations	44 2.316 59 182 ve estimate only when the acce between then many or General 45 7 7	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data isite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects	0.895 143.8 201
229 230 231 232 233 234 235 236 237 238 239 240 241 241 242 243 244 245 246	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and with AMMONIA-NITROGEN (mg/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects	44 2.316 59 182 ve estimate only when the tions collect then many or General 45 7 7 7 7	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data isite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects	0.895 143.8 201 0 0 38 1
229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 244 245 246 247	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and with AMMONIA-NITROGEN (mg/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect	44 2.316 59 182 ve estimate only when the acce between hen many or General 45 7 7 7 0.1	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect	0.895 143.8 201

<u> </u>	^	D				F	<u> </u>	<u> </u>				
251	A	В	C Mean	D of Detected	E Logged Data	-1.389	G	Н	SD (J of Detected L	K Logged Data	L 0.699
251					00							
252				Crit	tical Values fo	or Backarou	nd Threshol	d Values (B ⁻	ΓVs)			
253			Tole		K (For UTL)	2.085				d2m	ax (for USL)	2.915
254					(/							
255					Norm	al GOF Tes	t on Detects					
256			5	Shapiro Wilk	Test Statistic	0.904			Shapiro Wil	k GOF Test		
257				•	Critical Value	0.803	De	etected Data	•		nificance Lev	el
258					Test Statistic	0.254				GOF Test		
259			Ę	5% Lilliefors (Critical Value	0.304	De	etected Data	appear Norn	nal at 5% Sig	nificance Lev	el
260				De	tected Data a	ppear Norn				J		
261												
262				Kaplan Me	ier (KM) Back	around Stat	tistics Assur	ning Normal	Distribution			
263					KM Mean	0.132		<u> </u>			KM SD	0.104
264				95% UTL95	% Coverage	0.348				95%	KM UPL (t)	0.308
265					Percentile (z)	0.265					Percentile (z)	0.302
266					Percentile (z)	0.373					5% KM USL	0.434
267												
268				DL/2 Subs	titution Back	around Stati	stics Assum	ning Normal	Distribution			
269					Mean	0.0896					SD	0.119
270				95% UTL95	% Coverage	0.337					95% UPL (t)	0.291
271					Percentile (z)	0.242					Percentile (z)	0.285
272					Percentile (z)	0.366						0.435
273			DL/2 is		nended meth	od. DL/2 pro	ovided for co	mparisons a	and historical	reasons		
274						•						
275				C	Gamma GOF	Tests on De	etected Obse	ervations Or	ly			
276					Test Statistic	0.319			- nderson-Dar	ling GOF Te	est	
277				5% A-D (Critical Value	0.713	Detecte			-	5% Significanc	e Level
278 279				K-S	Test Statistic	0.212			Colmogorov-			
279				5% K-S (Critical Value	0.314	Detecte	d data appea	r Gamma Di	stributed at 5	5% Significanc	e Level
281				Detected	l data appear	Gamma Di	stributed at {	5% Significa	nce Level			
282												
283					Gamma	Statistics or	Detected D	ata Only				
284					k hat (MLE)	2.665			ks	tar (bias cor	rected MLE)	1.618
285				The	eta hat (MLE)	0.114			Theta s	tar (bias cor	rected MLE)	0.188
286					nu hat (MLE)	37.3				nu star (bia	is corrected)	22.65
287			М	LE Mean (bia	as corrected)	0.304						
288				MLE Sd (bia	as corrected)	0.239			95% Percen	tile of Chisqu	uare (2kstar)	8.22
289							I					
209				(Gamma ROS	Statistics us	sing Imputed	J Non-Detec	ts			
291			GROS may	/ not be used	when data se	et has > 50%	NDs with m	any tied obs	ervations at r	nultiple DLs		
292		GROS may	y not be used	d when kstar	of detects is s	mall such a	s <1.0, espe	cially when th	ne sample siz	ze is small (e	e.g., <15-20)	
292			Fc	or such situat	ions, GROS n	nethod may	yield incorre	ct values of	UCLs and BT	Vs		
293				٦	This is especia	ally true whe	n the sample	ə size is sma	II.			
295		For gar	mma distribu	ted detected	data, BTVs a	nd UCLs ma	y be comput	ed using gar	nma distribut	ion on KM es	stimates	
295					Minimum	0.01					Mean	0.0558
290					Maximum	0.63					Median	0.01
298					SD	0.13					CV	2.339
298					k hat (MLE)	0.518			k s	tar (bias cor	rected MLE)	0.499
300				The	eta hat (MLE)	0.108				tar (bias cor	-	0.112
300				-	, ,						,	

	A B C D	E	F	G H I J	К	1
201	-	∟ L hat (MLE)	46.65	nu star (bias		44.88
301	MLE Mean (bias	```	0.0558	MLE Sd (bias	,	0.079
302 303	95% Percentile of Chisqu		3.835		Percentile	0.151
304	95%	Percentile	0.214	99% F	Percentile	0.371
305	The following stati	stics are co	mputed using	g Gamma ROS Statistics on Imputed Data		
306	Upper Limits u	sing Wilson	n Hilferty (WH	l) and Hawkins Wixley (HW) Methods		
307		WH	HW		WH	HW
308	95% Approx. Gamma UTL with 95% Coverage	0.249	0.238	95% Approx. Gamma UPL	0.18	0.167
309	95% Gamma USL	0.452	0.465			
310						
311	Est	imates of G	amma Param	neters using KM Estimates		
312		Mean (KM)	0.132		SD (KM)	0.104
313	Va	iance (KM)	0.0107	SE of M	/lean (KM)	0.0167
314		k hat (KM)	1.616	k	star (KM)	1.523
315		nu hat (KM)	145.4	nu	ı star (KM)	137.1
316	the	ta hat (KM)	0.0816	theta	a star (KM)	0.0865
317	80% gamma perc	entile (KM)	0.204	90% gamma perce	entile (KM)	0.274
318	95% gamma perc	entile (KM)	0.342	99% gamma perce	entile (KM)	0.495
319						
320	The following sta	tistics are c	omputed usir	ng gamma distribution and KM estimates		
321	Upper Limits u	sing Wilson	n Hilferty (WH	l) and Hawkins Wixley (HW) Methods		
322		WH	HW		WH	HW
323	95% Approx. Gamma UTL with 95% Coverage	0.3	0.293	95% Approx. Gamma UPL	0.258	0.252
324	95% KM Gamma Percentile	0.252	0.246	95% Gamma USL	0.404	0.401
325						
326	Lo	gnormal GO	F Test on De	etected Observations Only		
327	Shapiro Wilk T	est Statistic	0.935	Shapiro Wilk GOF Test		
328	5% Shapiro Wilk Ci	itical Value	0.803	Detected Data appear Lognormal at 5% Sig	nificance Le	evel
329	Lilliefors To	est Statistic	0.19	Lilliefors GOF Test		
330	5% Lilliefors Ci		0.304	Detected Data appear Lognormal at 5% Sig	nificance Le	evel
331	Detec					
332		ted Data ap	pear Lognori	mal at 5% Significance Level		
		· · ·				
333		S Statistics		ognormal Distribution Using Imputed Non-Detects		
333 334	Mean in Or	S Statistics ginal Scale	Assuming L	ognormal Distribution Using Imputed Non-Detects Mean in	Log Scale	-4.304
	Mean in Ori SD in Ori	PS Statistics ginal Scale ginal Scale	Assuming L 0.0624 0.13	ognormal Distribution Using Imputed Non-Detects Mean in SD in	Log Scale Log Scale	1.874
334	Mean in Ori SD in Ori 95% UTL95%	PS Statistics ginal Scale ginal Scale 6 Coverage	Assuming L 0.0624 0.13 0.672	ognormal Distribution Using Imputed Non-Detects Mean in SD in 95% BCA UTL95%	Log Scale Log Scale Coverage	1.874 0.586
334 335	Mean in Ori SD in Ori 95% UTL95% 95% Bootstrap (%) UTL95%	S Statistics ginal Scale ginal Scale 6 Coverage 6 Coverage	Assuming L 0.0624 0.13 0.672 0.596	ognormal Distribution Using Imputed Non-Detects Mean in SD in 95% BCA UTL95% 95	Log Scale Log Scale Coverage 5% UPL (t)	1.874 0.586 0.326
334 335 336	Mean in Ori SD in Ori 95% UTL95% 95% Bootstrap (%) UTL95% 90% Pe	PS Statistics ginal Scale ginal Scale 6 Coverage 6 Coverage ercentile (z)	Assuming L 0.0624 0.13 0.672 0.596 0.149	ognormal Distribution Using Imputed Non-Detects Mean in SD in 95% BCA UTL95% 95 95% Per	Log Scale Log Scale Coverage 5% UPL (t) rcentile (z)	1.874 0.586 0.326 0.295
334 335 336 337	Mean in Ori SD in Ori 95% UTL95% 95% Bootstrap (%) UTL95% 90% Pe	S Statistics ginal Scale ginal Scale 6 Coverage 6 Coverage	Assuming L 0.0624 0.13 0.672 0.596	ognormal Distribution Using Imputed Non-Detects Mean in SD in 95% BCA UTL95% 95 95% Per	Log Scale Log Scale Coverage 5% UPL (t)	1.874 0.586 0.326
334 335 336 337 338	Mean in Ori SD in Ori 95% UTL95% 95% Bootstrap (%) UTL95% 90% Pe 99% Pe	PS Statistics ginal Scale ginal Scale & Coverage & Coverage ercentile (z) ercentile (z)	Assuming L 0.0624 0.13 0.672 0.596 0.149 1.056	ognormal Distribution Using Imputed Non-Detects Mean in SD in 95% BCA UTL95% 95 95% Per	Log Scale Log Scale Coverage 5% UPL (t) rcentile (z)	1.874 0.586 0.326 0.295
334 335 336 337 338 339	Mean in Ori SD in Ori 95% UTL95% 95% Bootstrap (%) UTL95% 90% Pe 99% Pe 99% Pe	S Statistics ginal Scale ginal Scale 6 Coverage coverage ercentile (z) ercentile (z)	Assuming L 0.0624 0.13 0.672 0.596 0.149 1.056	ognormal Distribution Using Imputed Non-Detects Mean in SD in 95% BCA UTL95% 95 95% Per 95% Per	Log Scale Log Scale Coverage 5% UPL (t) rcentile (z) 95% USL	1.874 0.586 0.326 0.295 3.185
334 335 336 337 338 339 340	Mean in Ori SD in Ori 95% UTL95% 95% Bootstrap (%) UTL95% 90% Pe 99% Pe Statistics using KM KM Mean of Le	PS Statistics ginal Scale ginal Scale 6 Coverage 6 Coverage ercentile (z) ercentile (z) I estimates	Assuming L 0.0624 0.13 0.672 0.596 0.149 1.056 on Logged D -2.16	ognormal Distribution Using Imputed Non-Detects Mean in SD in 95% BCA UTL95% 95 95% Per 95% Per Pata and Assuming Lognormal Distribution 95% KM UTL (Lognormal)95%	Log Scale Log Scale Coverage 5% UPL (t) rcentile (z) 95% USL Coverage	1.874 0.586 0.326 0.295 3.185 0.276
334 335 336 337 338 339 340 341	Mean in Ori SD in Ori 95% UTL95% 95% Bootstrap (%) UTL95% 90% Pe 99% Pe Statistics using KM KM Mean of Le KM SD of Le	PS Statistics ginal Scale ginal Scale 6 Coverage coverage ercentile (z) ercentile (z) I estimates ogged Data	Assuming L 0.0624 0.13 0.672 0.596 0.149 1.056 on Logged D -2.16 0.418	ognormal Distribution Using Imputed Non-Detects Mean in SD in 95% BCA UTL95% 95 95% Per 95% Per 95% KM UTL (Lognormal)95% 95% KM UTL (Lognormal)95%	Log Scale Log Scale Coverage 5% UPL (t) rcentile (z) 95% USL Coverage ognormal)	1.874 0.586 0.326 0.295 3.185 0.276 0.234
334 335 336 337 338 339 340 341 342	Mean in Ori SD in Ori 95% UTL95% 95% Bootstrap (%) UTL95% 90% Pe 99% Pe Statistics using KM KM Mean of Le	PS Statistics ginal Scale ginal Scale 6 Coverage coverage ercentile (z) ercentile (z) I estimates ogged Data	Assuming L 0.0624 0.13 0.672 0.596 0.149 1.056 on Logged D -2.16	ognormal Distribution Using Imputed Non-Detects Mean in SD in 95% BCA UTL95% 95 95% Per 95% Per Pata and Assuming Lognormal Distribution 95% KM UTL (Lognormal)95%	Log Scale Log Scale Coverage 5% UPL (t) rcentile (z) 95% USL Coverage ognormal)	1.874 0.586 0.326 0.295 3.185 0.276
334 335 336 337 338 339 340 341 342 343	Mean in Ori SD in Ori 95% UTL95% 95% Bootstrap (%) UTL95% 90% Pe 99% Pe Statistics using KM KM Mean of Le KM SD of Le 95% KM Percentile Lo	S Statistics ginal Scale ginal Scale 6 Coverage 6 Coverage ercentile (z) ercentile (z) I estimates ogged Data ogged Data gnormal (z)	Assuming L 0.0624 0.13 0.672 0.596 0.149 1.056 on Logged D -2.16 0.418 0.229	ognormal Distribution Using Imputed Non-Detects Mean in SD in 95% BCA UTL95% 95 95% Per 95% Per 95% KM UTL (Lognormal)95% 95% KM UTL (Lognormal)95% 95% KM UPL (L 95% KM USL (L	Log Scale Log Scale Coverage 5% UPL (t) rcentile (z) 95% USL Coverage ognormal)	1.874 0.586 0.326 0.295 3.185 0.276 0.234
334 335 336 337 338 339 340 341 342 343 344	Mean in Ori SD in Ori 95% UTL95% 95% Bootstrap (%) UTL95% 90% Pe 99% Pe Statistics using KM KM Mean of Lo KM SD of Lo 95% KM Percentile Lo Backgr	S Statistics ginal Scale ginal Scale 6 Coverage coverage ercentile (z) ercentile (z) 1 estimates ogged Data ogged Data gnormal (z)	Assuming L 0.0624 0.13 0.672 0.596 0.149 1.056 on Logged D -2.16 0.418 0.229 Statistics Ass	ognormal Distribution Using Imputed Non-Detects Mean in SD in 95% BCA UTL95% 95 95% Per 95% Per 95% KM UTL (Lognormal)95% 95% KM UPL (Lognormal)95% 95% KM UPL (Lognormal)95% 95% KM USL (Lognormal)95%	Log Scale Log Scale Coverage 5% UPL (t) rcentile (z) 95% USL Coverage ognormal) ognormal)	1.874 0.586 0.326 0.295 3.185 0.276 0.234 0.39
334 335 336 337 338 339 340 341 342 343 344 345	Mean in Ori SD in Ori 95% UTL95% 95% Bootstrap (%) UTL95% 90% Pe 99% Pe 99% Pe Statistics using KM KM Mean of Le KM SD of Le 95% KM Percentile Lo Backgr Mean in Ori	S Statistics ginal Scale ginal Scale 6 Coverage 6 Coverage ercentile (z) ercentile (z) 1 estimates ogged Data ogged Data gnormal (z) ound DL/2 S ginal Scale	Assuming L 0.0624 0.13 0.672 0.596 0.149 1.056 on Logged D -2.16 0.418 0.229 Statistics Ass 0.0896	ognormal Distribution Using Imputed Non-Detects Mean in SD in 95% BCA UTL95% 95 95% Per 95% Per 95% KM UTL (Lognormal)95% 95% KM UTL (Lognormal)95% 95% KM UPL (Li 95% KM USL (Li suming Lognormal Distribution Mean in	Log Scale Log Scale Coverage 5% UPL (t) rcentile (z) 95% USL Coverage ognormal) ognormal)	1.874 0.586 0.326 0.295 3.185 0.276 0.276 0.234 0.39
334 335 336 337 338 339 340 341 342 343 344 345 346	Mean in Ori SD in Ori 95% UTL95% 95% Bootstrap (%) UTL95% 90% Pe 99% Pe Statistics using KM KM Mean of Lu 85% KM Percentile Lo 95% KM Percentile Lo Backgr Mean in Ori	S Statistics ginal Scale ginal Scale 6 Coverage coverage ercentile (z) ercentile (z) 1 estimates ogged Data ogged Data gnormal (z) ound DL/2 S ginal Scale ginal Scale	Assuming L 0.0624 0.13 0.672 0.596 0.149 1.056 on Logged D -2.16 0.418 0.229 Statistics Ass 0.0896 0.119	ognormal Distribution Using Imputed Non-Detects Mean in SD in 95% BCA UTL95% 95 95% Per 95% Per 95% KM UTL (Lognormal)95% 95% KM UTL (Lognormal)95% 95% KM UPL (L 95% KM USL (L Suming Lognormal Distribution Mean in SD in	Log Scale Log Scale Coverage 5% UPL (t) rcentile (z) 95% USL Coverage ognormal) ognormal) Log Scale Log Scale	1.874 0.586 0.295 3.185 0.276 0.234 0.39 -2.746 0.643
334 335 336 337 338 339 340 341 342 343 344 345 346 347	Mean in Ori SD in Ori 95% UTL95% 95% Bootstrap (%) UTL95% 90% Pe 99% Pe 99% Pe Statistics using KM KM Mean of Le KM SD of Le 95% KM Percentile Lo Backgr Mean in Ori SD in Ori	S Statistics ginal Scale ginal Scale 6 Coverage coverage ercentile (z) ercentile (z) 1 estimates ogged Data ogged Data gnormal (z) ound DL/2 S ginal Scale ginal Scale	Assuming L 0.0624 0.13 0.672 0.596 0.149 1.056 on Logged D -2.16 0.418 0.229 Statistics Ass 0.0896	ognormal Distribution Using Imputed Non-Detects Mean in SD in 95% BCA UTL95% 95% Per 95% Per 95% KM UTL (Degnormal)95% 95% KM UTL (Lognormal)95% 95% KM UPL (Li 95% KM USL (Li	Log Scale Log Scale Coverage 5% UPL (t) rcentile (z) 95% USL Coverage ognormal) ognormal)	1.874 0.586 0.326 0.295 3.185 0.276 0.276 0.234 0.39

351	A	<u> </u>			-		- 1	0	1		-		-	-	17	
35	A	В	С	D 99%	E Percentile	(z)	F 0.286	G	H		I		J	9	K 5% USL	L 0.418
			DL/2 is n	ot a Recom		` '	d. DL/2 pro	vided for c	omparison	s and h	istoric	al re	asons.			
352									•							
353 354				N	onparame	tric Di	istribution	Free Backg	round Sta	tistics						
				Data appea	=				-		e Leve	el				
355 356																
357			Nonpara	metric Uppe	er Limits fo	r BTV	/s(no disti	nction made	e between	detects	and n	nond	etects)			
358					of Statistic		44						•	5% C	overage	0.46
359		Appr	ox, fused	to compute	achieved (CC	1.158	Approxima	ate Actual (Confide	nce Co	ceffic	cient ach	nievec	l by UTL	0.665
360	Approximate	e Sample Si	ize needec	to achieve	specified (CC	93							9	5% UPL	0.445
361					95% U	SL	0.63					95%	6 KM Cł	nebysl	nev UPL	0.589
362																
363	N	lote: The us	e of USL t	ends to yield	d a conser	vative	estimate o	of BTV, esp	ecially whe	n the s	ample	size	starts e	xceed	ling 20.	
364	1	Therefore, o	ne may us	e USL to es	timate a B	TV on	nly when th	e data set r	epresents	a backg	jround	data	set fre	e of o	utliers	
365				and consi	sts of obse	ervatio	ons collecte	ed from clea	an unimpac	ted loca	ations.					
366		The	use of US	L tends to p	rovide a ba	alance	e between	false positiv	es and fals	se nega	tives p	orovi	ded the	data		
367		repre	esents a ba	ackground d	ata set and	d whe	n many on	site observa	ations need	to be o	compa	red v	vith the	BTV.		
368																
369	BENZENE (ug/	/L)														
370																
371							General	Statistics								
372			Total	Number of	Observatio	ons	45				Numbe	er of	Missing	Obse	rvations	0
373			Number	of Distinct	Observatio	ons	1									
374				Numb	er of Dete	cts	0 Number of N							f Non	-Detects	45
375			N	umber of Dis	stinct Dete	cts	0 Number of Distinct Non-De							-Detects	1	
376				Mir	nimum Dete	ect	N/A	Minimum Non-De						n-Detect	1	
377				Мах	kimum Dete	ect	N/A						Maximu	m No	n-Detect	1
378				Varia	nce Detect	ed	N/A						Percen	t Non	-Detects	100%
379				M	ean Detect	ed	N/A							SD [Detected	N/A
380			Mean	of Detected	Logged Da	ata	N/A				SD) of [Detected	l Logo	jed Data	N/A
381																
382				ervations ar												
383				e <mark>mean, U</mark> C						-						
384	The	Project Tea	am may de	ecide to use	alternativ	e site	specific v	alues to es	timate envi	ironme	ntal pa	Iram	eters (e	.g., E	PC, BTV).
385																
386				The d	ata set for	varia	ble BENZ	ENE (ug/L)	was not pi	rocesse	ed!					
387																
388																
389	BICARBONAT	E ALKALIN	ITY (mg/L	.)												
390								.								
391					<u></u>		General	Statistics						<u>.</u>		
392				Number of			45				Numbe	er of	Missing	Obse	ervations	0
393			Number	of Distinct			14							6 N I	Det	05
394				er of Deter		20				NI 7				-Detects	25	
395			N		14				Numb	oer o			-Detects	1		
				ect	5	Minimum Non-Dete							5			
396					182						n-Detect	5				
396 397					- -								D		D · · ·	FF
					nce Detect		2624						Percen		-Detects	55.56%
397					ean Detect	ed	2624 36.65 2.823							SD [-Detects Detected Jed Data	55.56% 51.23 1.241

	A B C D E	F	G H I J K	L							
401											
402	Critical Values for	or Backgrou	nd Threshold Values (BTVs)								
403	Tolerance Factor K (For UTL)	2.085	d2max (for USL)	2.915							
404											
405			t on Detects Only								
406	Shapiro Wilk Test Statistic	0.673	Shapiro Wilk GOF Test								
407	5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level								
408	Lilliefors Test Statistic	0.268	Lilliefors GOF Test								
409	5% Lilliefors Critical Value	0.192	Data Not Normal at 5% Significance Level								
410	Data Not	Normal at 5	% Significance Level								
411	Kaplan Majar (KM) Paak	around Sto	viction Accuming Normal Distribution								
412	КМ Меал	19.07	tistics Assuming Normal Distribution KM SD	36.81							
413	95% UTL95% Coverage	95.83	95% KM UPL (t)	81.61							
414	_	66.25		79.62							
415	90% KM Percentile (z) 99% KM Percentile (z)	104.7	95% KM Percentile (z) 95% KM USL	126.4							
416		104.7	95 /0 KW USL	120.4							
417	DI /2 Substitution Back	round Stati	stics Assuming Normal Distribution								
418	Mean	17.68	SDCS ASSUMING NOTIAL DIStribution	37.78							
419	95% UTL95% Coverage	96.46	95% UPL (t)	81.87							
420	90% Percentile (z)	66.1	95% Percentile (z)	79.83							
421	99% Percentile (z)	105.6	95% USL	127.8							
422			ovided for comparisons and historical reasons	127.0							
423		p									
424	Gamma GOF	Tests on De	etected Observations Only								
425	A-D Test Statistic	1.343	Anderson-Darling GOF Test								
426	5% A-D Critical Value	0.779	Data Not Gamma Distributed at 5% Significance Leve	9							
427 428	K-S Test Statistic	0.251	Kolmogorov-Smirnov GOF								
420	5% K-S Critical Value	0.201	Data Not Gamma Distributed at 5% Significance Leve	l							
430	Data Not Gamn	na Distribute	ed at 5% Significance Level								
431											
432	Gamma	Statistics or	Detected Data Only								
433	k hat (MLE)	0.767	k star (bias corrected MLE)	0.685							
434	Theta hat (MLE)	47.81	Theta star (bias corrected MLE)	53.51							
435	nu hat (MLE)	30.66	nu star (bias corrected)	27.4							
436	MLE Mean (bias corrected)	36.65									
437	MLE Sd (bias corrected)	44.28	95% Percentile of Chisquare (2kstar)	4.699							
438											
439			sing Imputed Non-Detects								
440	-		NDs with many tied observations at multiple DLs								
441			s <1.0, especially when the sample size is small (e.g., <15-20)								
442			yield incorrect values of UCLs and BTVs								
443		· ·	n the sample size is small.								
444	-		y be computed using gamma distribution on KM estimates								
445	Minimum	0.01	Mean	16.29							
446	Maximum	182	Median	0.01							
447	SD	38.37	CV	2.355							
448	k hat (MLE)	0.182	k star (bias corrected MLE)	0.185							
449	Theta hat (MLE)	89.37	Theta star (bias corrected MLE)	88.09							
450	nu hat (MLE)	16.41	nu star (bias corrected)	16.65							

	A B C D	E	F	G H I J K	L
451	MLE Mean (bia		16.29	MLE Sd (bias corrected)	37.89
452	95% Percentile of Chisqu	are (2kstar)	1.944	90% Percentile	49.2
453	95%	% Percentile	85.63	99% Percentile	187.3
454	The following stat	istics are cor	nputed usin	g Gamma ROS Statistics on Imputed Data	
455	Upper Limits	using Wilson	Hilferty (W	H) and Hawkins Wixley (HW) Methods	
456		WH	HW	WH	HW
457	95% Approx. Gamma UTL with 95% Coverage	95.87	111.8	95% Approx. Gamma UPL 63.1	66.63
458	95% Gamma USL	200.9	282.8		
459					
460	Es			meters using KM Estimates	
461		Mean (KM)	19.07	SD (KM)	36.81
462	Va	riance (KM)	1355	SE of Mean (KM)	5.631
463		k hat (KM)	0.268	k star (KM)	0.265
464		nu hat (KM)	24.14	nu star (KM)	23.86
465		eta hat (KM)	71.08	theta star (KM)	71.9
466	80% gamma per		28.24	90% gamma percentile (KM)	56.96
467	95% gamma per	centile (KM)	90.66	99% gamma percentile (KM)	179.7
468					
469			•	ng gamma distribution and KM estimates	
470	Upper Limits			H) and Hawkins Wixley (HW) Methods	
471		WH	HW	WH	HW
472	95% Approx. Gamma UTL with 95% Coverage	76.72	74.73	95% Approx. Gamma UPL 57.87	55.09
473	95% KM Gamma Percentile	55.51	52.69	95% Gamma USL 130.2	134.3
474				stasted Observations Only	
475	Lo Shapiro Wilk T	·	0.864	etected Observations Only	
476	5% Shapiro Wilk C		0.864	Shapiro Wilk GOF Test Data Not Lognormal at 5% Significance Level	
477	•	est Statistic	0.905	Lilliefors GOF Test	
478	5% Lilliefors C		0.212	Data Not Lognormal at 5% Significance Level	
479				5% Significance Level	
480		Data Mor E	ognormal at		
481	Background Lognormal R(OS Statistics	Assumina	Lognormal Distribution Using Imputed Non-Detects	
482		iginal Scale	16.74	Mean in Log Scale	0.79
483		iginal Scale	38.18	SD in Log Scale	2.246
484	95% UTL95	•	238.3	95% BCA UTL95% Coverage	154
485	95% Bootstrap (%) UTL95	0	176.4	95% UPL (t)	100.1
486		ercentile (z)	39.21	95% Percentile (z)	88.67
487 489		ercentile (z)	409.8	95% USL	1538
488		. /			
489	Statistics using KI	M estimates	on Logged [Data and Assuming Lognormal Distribution	
490 491	KM Mean of L		2.149	95% KM UTL (Lognormal)95% Coverage	69.98
491		.ogged Data	1.007	95% KM UPL (Lognormal)	47.43
492	95% KM Percentile Lo		44.92	95% KM USL (Lognormal)	161.5
493					
495	Backg	round DL/2 S	Statistics As	suming Lognormal Distribution	
495	Mean in Or	iginal Scale	17.68	Mean in Log Scale	1.764
490	SD in Or	iginal Scale	37.78	SD in Log Scale	1.258
498	95% UTL95	% Coverage	80.4	95% UPL (t)	49.45
499	90% P	ercentile (z)	29.26	95% Percentile (z)	46.21
500	99% P	ercentile (z)	108.9	95% USL	228.5
000					

	A B C D E	F	G H I J K	
501			ovided for comparisons and historical reasons.	<u> </u>
502				
503	Nonparametric	Distribution	Free Background Statistics	
504	Data do not fe	ollow a Disc	ernible Distribution (0.05)	
505				
506	Nonparametric Upper Limits for B	TVs(no disti	nction made between detects and nondetects)	
507	Order of Statistic, r	44	95% UTL with95% Coverage	154
508	Approx, f used to compute achieved CC	1.158	Approximate Actual Confidence Coefficient achieved by UTL	0.665
509	Approximate Sample Size needed to achieve specified CC	93		137.8
510	95% USL	182	95% KM Chebyshev UPL	181.3
511				
512			of BTV, especially when the sample size starts exceeding 20.	
513			ne data set represents a background data set free of outliers	
514			ted from clean unimpacted locations.	
515			false positives and false negatives provided the data	
516	represents a background data set and wi	hen many or	nsite observations need to be compared with the BTV.	
517				
518	CALCIUM, TOTAL (mg/L)			
519	General Statistics			
520	Total Number of Observations	44	Number of Distinct Observations	38
521	Minimum	18.9	First Quartile	21.05
522	Second Largest	74.7	Median	23.1
523	Maximum	93	Third Quartile	25.08
524	Mean	27.87	SD	15.25
525	Coefficient of Variation	0.547	Skewness	3.114
526	Mean of logged Data	3.245	SD of logged Data	0.357
527		0.2.10		0.007
528	Critical Values for	or Backgrou	nd Threshold Values (BTVs)	
529	Tolerance Factor K (For UTL)	2.091	d2max (for USL)	2.906
530 531				
532		Normal	GOF Test	
533	Shapiro Wilk Test Statistic	0.531	Shapiro Wilk GOF Test	
534	5% Shapiro Wilk Critical Value	0.944	Data Not Normal at 5% Significance Level	
535	Lilliefors Test Statistic	0.354	Lilliefors GOF Test	
536	5% Lilliefors Critical Value	0.132	Data Not Normal at 5% Significance Level	
537	Data Not	Normal at §	% Significance Level	
538				
539	Background S	tatistics Ass	suming Normal Distribution	
540	95% UTL with 95% Coverage	59.75	90% Percentile (z)	47.41
541	95% UPL (t)	53.79	95% Percentile (z)	52.95
542	95% USL	72.18	99% Percentile (z)	63.34
543				
544			GOF Test	
545	A-D Test Statistic	6.362	Anderson-Darling Gamma GOF Test	
546	5% A-D Critical Value	0.752	Data Not Gamma Distributed at 5% Significance Leve	
547	K-S Test Statistic	0.314	Kolmogorov-Smirnov Gamma GOF Test	
548	5% K-S Critical Value	0.134	Data Not Gamma Distributed at 5% Significance Leve	
549	Data Not Gamr	na Distribut	ed at 5% Significance Level	
550				

	A B C D E	F	G H I J K	1
551		Gamma	Statistics	
552	k hat (MLE)	6.236	k star (bias corrected MLE)	5.826
553	Theta hat (MLE)	4.47	Theta star (bias corrected MLE)	4.784
554	nu hat (MLE)	548.8	nu star (bias corrected)	512.7
555	MLE Mean (bias corrected)	27.87	MLE Sd (bias corrected)	11.55
556				
557	Background S	tatistics Ass	uming Gamma Distribution	
558	95% Wilson Hilferty (WH) Approx. Gamma UPL	49.21	90% Percentile	43.31
559	95% Hawkins Wixley (HW) Approx. Gamma UPL	48.66	95% Percentile	49.18
560	95% WH Approx. Gamma UTL with 95% Coverage	55.9	99% Percentile	61.48
561	95% HW Approx. Gamma UTL with 95% Coverage	55.45		
562	95% WH USL	71.76	95% HW USL	71.85
563				
564		Lognorma	I GOF Test	
565	Shapiro Wilk Test Statistic	0.671	Shapiro Wilk Lognormal GOF Test	
566	5% Shapiro Wilk Critical Value	0.944	Data Not Lognormal at 5% Significance Level	
567	Lilliefors Test Statistic	0.284	Lilliefors Lognormal GOF Test	
568	5% Lilliefors Critical Value	0.132	Data Not Lognormal at 5% Significance Level	
569	Data Not L	ognormal a	5% Significance Level	
570				
571			ming Lognormal Distribution	
572	95% UTL with 95% Coverage	54.16	90% Percentile (z)	40.56
573	95% UPL (t)	47.1	95% Percentile (z)	46.18
574	95% USL	72.45	99% Percentile (z)	58.9
575				
576	-		Free Background Statistics	
577	Data do not f	ollow a Disc	ernible Distribution (0.05)	
578			.	
579			r Background Threshold Values	00
580	Order of Statistic, r	44	95% UTL with 95% Coverage	93
581	Approx, f used to compute achieved CC	2.316	Approximate Actual Confidence Coefficient achieved by UTL	0.895
582		00.00	Approximate Sample Size needed to achieve specified CC	59
583	95% Percentile Bootstrap UTL with 95% Coverage	90.26	95% BCA Bootstrap UTL with 95% Coverage	89.3
584	95% UPL	73.1	90% Percentile	34.63 65.96
585	90% Chebyshev UPL	74.13	95% Percentile	
586	95% Chebyshev UPL 95% USL	95.08 93	99% Percentile	85.13
587	95% USL	30		
588	Note: The use of USL tends to viold a conservati	ve estimate	of RTV, especially when the sample size starts exceeding 20	
589			of BTV, especially when the sample size starts exceeding 20.	
589 590	Therefore, one may use USL to estimate a BTV	only when th	ne data set represents a background data set free of outliers	
589 590 591	Therefore, one may use USL to estimate a BTV and consists of observa	only when the the second secon	ed from clean unimpacted locations.	
589 590 591 592	Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar	only when thations collect	he data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data	
589 590 591 592 593	Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar	only when thations collect	ed from clean unimpacted locations.	
589 590 591 592 593 594	Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w	only when thations collect	he data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data	
589 590 591 592 593 594 595	Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar	only when thations collect	he data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data	
589 590 591 592 593 594 595 596	Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w CHLORIDE (mg/L)	only when thations collect	he data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data	
589 590 591 592 593 594 595 596 597	Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w CHLORIDE (mg/L) General Statistics	only when th ations collect nce between hen many or	ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data nsite observations need to be compared with the BTV.	39
589 590 591 592 593 594 595 596 597 598	Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w CHLORIDE (mg/L)	only when thations collect ince between then many or 45	ne data set represents a background data set free of outliers and from clean unimpacted locations. false positives and false negatives provided the data insite observations need to be compared with the BTV.	39
589 590 591 592 593 594 595 596 597	Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w CHLORIDE (mg/L) General Statistics Total Number of Observations	only when th ations collect nce between hen many or	ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data nsite observations need to be compared with the BTV.	39 22.3 25.1

<u> </u>	A	В	С		D	E	F	G		Н	l i	-	J	К	
601	A	D	U U		D	 Maximur		G		П			J	Third Quartile	26.5
601						Mear	25.01							SD	3.413
602				C	oefficier	nt of Variation	0.136							Skewness	0.978
603	3 Mean of logged Data											SD	of logged Data		
604	4				0.2.1							0. 109904 2 414			
605	Critical Values f					for Backgrou	und Thres	hold Val	ues (B1	۲Vs)					
606	Toloropoo Ecotor K (Eor LITL)					•			u00 (B			h	2max (for USL)	2.915	
607					2.000						ŭ		2.010		
608						Normal	GOF Test								
609				Shar	niro Wilk	Test Statistic					Shanii	ro Wilk	GOF T	est	
610	5% Shapiro Wilk Critical Value							Г)ata No	-			cance Level		
611						Test Statistic			-				OF Tes		
612						Critical Value			Da	ita anne				ificance Level	
613				570 L			proximate No	rmal at 5					J /o Olym		
614					Dau	a ahhear vhi				cance	Levei				
615						Bookground	Statistics As	umina N	ormal Di	etributi	~				
616			05	0/ I ITI		5% Coverage				Suibuu			0.00	% Percentile (z)	29.38
617			90	% UIL	. with 95	95% UPL (t								% Percentile (z)	
618						95% UPL (I	34.96							% Percentile (z)	32.95
619						95% USL	54.90						997	% Percentile (2)	32.95
620							0								
621						Test Statistic		GOF Tes	t	A					
622								Data	- 4 - 1 - 1 - 4			-		GOF Test	
623						Critical Value	-	Dete						at 5% Significar	ICE LEVEI
624					-	Test Statistic								GOF Test	
625						Critical Value							ributed a	at 5% Significar	ICE LEVEI
626					Delecte		ir Gamma Di	sinduleu	al 5% 5	igninca		vei			
627							Commo	Statistics							
628						k hat (MLE		Statistics				k et	or (bioc	corrected MLE)	54.41
629					Th	eta hat (MLE							`	,	
630						nu hat (MLE		Theta star (bias corrected MLE) nu star (bias corrected) 4				4897			
631						as corrected								(bias corrected)	3.391
632					viean (Di		25.01					IV	ILE SU (3.391
633					-	ookaround (Statistics Ass	uming C		iotributi					
634			on Hilfortu	, /\ \ /LI\		Gamma UPL			amma D	ISUIDUU	on			90% Percentile	20.44
635				. ,	••										
636	0.5			. ,	•••	Gamma UPL 5% Coverage								95% Percentile 99% Percentile	30.83 33.56
637						5% Coverage									33.30
638	95	ли чир	ox. Gamfr			5% Coverage								95% HW USL	25.01
639					,	90 /0 WH USL	. 33.78							30 /0 NV USL	35.91
640									a t						
641				Char		Tost Statiati	Lognorma 0.954		อเ	Cho-	vire \A/ill	k 095	ormal O	OF Test	
642			E0.	•		Test Statistic			Det			-		OF Test	
643			5%			Critical Value			Data		-		-	nificance Level	
644						Test Statistic			D-/			-	mal GO		
645				о% L	illietors	Critical Value		at 5% of			-	nmai a	1 5% SIG	nificance Level	
646						uata appea	r Lognormal	at 5% Sig	unificanc	e Leve	1				
647							- 41 - 47			<u></u>					
648				o/			atistics assu	ming Log	normal l	Jistribu	tion				00.00
649			95	% UTL	with 98	5% Coverage								% Percentile (z)	
650						95% UPL (t	30.98						959	% Percentile (z)	30.76

· · · · ·		_					14	
051	A B C D E 95% USL	F 36.33	G	Н	1	J 99% P	K Percentile (z)	L 33.63
651							(_)	
652	Nonparametric	Distribution	n Free Backgrour	nd Statistic	s			
653	Data appear App							
654								
655	Nonparametric Up	oer Limits fo	or Background Th	nreshold Va	alues			
656	Order of Statistic, r					UTL with 95	% Coverage	34.3
657	Approx, f used to compute achieved CC	1.158	Approximate A	ctual Confi			-	0.665
658		1.100				ed to achieve s		93
659	95% Percentile Bootstrap UTL with 95% Coverage	34.46				UTL with 95		34.3
660	95% UPL	33.79			Jooloulup		% Percentile	28.48
661	90% Chebyshev UPL	35.36					% Percentile	32.1
662	95% Chebyshev UPL	40.05					% Percentile	34.41
663	95% USL					00		04.41
664	33% 00L	54.5						
665	Note: The use of USL tends to yield a conservat	ive estimate	of BTV especial	ly when the	sample	size starte ev	ceeding 20	
666	Therefore, one may use USL to estimate a BTV			·				
667	and consists of observa	-			-		of outliers	
668	The use of USL tends to provide a balar			1 C C C C C C C C C C C C C C C C C C C			ata	
669	represents a background data set and w							
670				S Need to b	e compa		I V.	
671	CIS 1,2-DICHLOROETHENE (ug/L)							
672								
673		Gaporal	Statistics					
674	Total Number of Observations		Statistics		Numb	er of Missing C	hearvations	0
675	Number of Distinct Observations	1			Numb			0
676	Number of Distinct Observations	0				Number of I	Non Dotocto	45
677	Number of Distinct Detects	0	Number of Non-Detects				45 1	
678	Minimum Detects	-	Number of Distinct Non-Detects Minimum Non-Detect				1	
679	Maximum Detect		Maximum Non-Detect			1		
680	Variance Detected	N/A	Percent Non-Detects			100%		
681	Mean Detected	N/A	SD Detected				N/A	
682	Mean of Detected Logged Data						N/A	
683		IWA			01			
684	Warning: All observations are Non-Detect	s (NDs) the	erefore all statist	ics and est	imates e	hould also be	NDsl	
685	Specifically, sample mean, UCLs, UPLs, an							
686	The Project Team may decide to use alternative s					-)
687					ional pe		., _, 0, 0, 0	<i>,</i> .
688	The data set for variable CIS			un/l) wae r	not proce	hazza		
689	The data set for variable CIS	S 1,2-DICHL		ug/L) was r	not proce	essed!		
689 690	The data set for variable CIS	3 1,2-DICHL	ORUETHENE (ug/L) was r	not proce	essed!		
689 690 691		3 1,2-DICHL		ug/L) was r	not proce	essed!		
689 690 691 692	The data set for variable CIS Chemical Oxygen Demand (mg/L)	31,2-DICHL		ug/L) was r	not proce	essed!		
689 690 691 692 693				ug/L) was r		essed!		
689 690 691 692 693 694	Chemical Oxygen Demand (mg/L)	General	Statistics	ug/L) was r			beenvetions	
689 690 691 692 693	Chemical Oxygen Demand (mg/L) Total Number of Observations	General 44		ug/L) was r		essed! er of Missing C	Deservations	0
689 690 691 692 693 694	Chemical Oxygen Demand (mg/L) Total Number of Observations Number of Distinct Observations	General 44 3		ug/L) was r		er of Missing C		
689 690 691 692 693 694 695	Chemical Oxygen Demand (mg/L) Total Number of Observations Number of Distinct Observations Number of Distervations	General 44 3 0		ug/L) was r	Numbe	er of Missing C Number of I	Non-Detects	44
689 690 691 692 693 694 695 696	Chemical Oxygen Demand (mg/L) Total Number of Observations Number of Distinct Observations Number of Detects Number of Distinct Detects	General 44 3 0 0		ug/L) was r	Numbe	er of Missing C Number of I per of Distinct I	Non-Detects Non-Detects	44
689 690 691 692 693 694 695 696 697	Chemical Oxygen Demand (mg/L) Total Number of Observations Number of Distinct Observations Number of Distervations	General 44 3 0 0 N/A		ug/L) was r	Numbe	er of Missing C Number of I per of Distinct I Minimum	Non-Detects	44

	A B C D E	F	G H I J K	
701	Variance Detected	N/A	Percent Non-Detects	100%
701	Mean Detected	N/A	SD Detected	N/A
702	Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A
704				
705	Warning: All observations are Non-Detects	s (NDs), the	refore all statistics and estimates should also be NDs!	
706	Specifically, sample mean, UCLs, UPLs, and	d other stati	stics are also NDs lying below the largest detection limit!	
707	The Project Team may decide to use alternative si	te specific v	alues to estimate environmental parameters (e.g., EPC, BTV)	•
708				
709	The data set for variable Ch	emical Oxy	gen Demand (mg/L) was not processed!	
710				
711				
	ETHYLBENZENE (mg/L)			
713				
714		General	Statistics	
715	Total Number of Observations	45	Number of Missing Observations	0
716	Number of Distinct Observations	1		
717	Number of Detects	0	Number of Non-Detects	45
718	Number of Distinct Detects	0	Number of Distinct Non-Detects	1
719	Minimum Detect	N/A	Minimum Non-Detect	1
720	Maximum Detect	N/A	Maximum Non-Detect	1
721	Variance Detected	N/A	Percent Non-Detects	100%
721	Mean Detected	N/A	SD Detected	N/A
723	Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A
723				
724				
725	Warning: All observations are Non-Detects	s (NDs), the	refore all statistics and estimates should also be NDs!	
725			refore all statistics and estimates should also be NDs! stics are also NDs lying below the largest detection limit!	
726	Specifically, sample mean, UCLs, UPLs, and	d other statis		
726 727	Specifically, sample mean, UCLs, UPLs, and	d other statis	stics are also NDs lying below the largest detection limit!	
726 727 728	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si	d other statis te specific v	stics are also NDs lying below the largest detection limit!	
726 727 728 729	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si	d other statis te specific v	stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV)	
726 727 728 729 730	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si	d other statis te specific v	stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV)	
726 727 728 729 730 731	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si	d other statis te specific v	stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV)	
726 727 728 729 730 731 732	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variabl	d other statis te specific v	stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV)	
726 727 728 729 730 731 732 733	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variabl	d other statis te specific v	stics are also NDs lying below the largest detection limit! values to estimate environmental parameters (e.g., EPC, BTV)	
726 727 728 729 730 731 732 733 733	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variabl	d other statis te specific v e ETHYLBE	stics are also NDs lying below the largest detection limit! values to estimate environmental parameters (e.g., EPC, BTV)	
726 727 728 729 730 731 732 733 733 734 735	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variabl FLUORIDE (mg/L)	d other statis te specific v e ETHYLBE General	stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV) NZENE (mg/L) was not processed!	
726 727 728 729 730 731 732 733 734 735 736	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variabl FLUORIDE (mg/L) Total Number of Observations	d other statis te specific v e ETHYLBE General 44	stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV) NZENE (mg/L) was not processed!	
726 727 728 729 730 731 732 733 733 734 735 736 737	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variabl FLUORIDE (mg/L) Total Number of Observations Number of Distinct Observations	d other statis te specific v e ETHYLBE General 44 7	stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV) NZENE (mg/L) was not processed! Statistics Number of Missing Observations	0
726 727 728 729 730 731 732 733 734 735 736 737 738	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variabl FLUORIDE (mg/L) Total Number of Observations Number of Distinct Observations Number of Detects	d other statis te specific v e ETHYLBE General 44 7 15	Stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV) ENZENE (mg/L) was not processed! Statistics Number of Missing Observations Number of Non-Detects	0 29
726 727 728 729 730 731 732 733 734 735 736 737 738 738 739	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variable FLUORIDE (mg/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects	d other statis te specific v e ETHYLBE General 44 7 15 6	Stics are also NDs lying below the largest detection limit! (alues to estimate environmental parameters (e.g., EPC, BTV) (NZENE (mg/L) was not processed! Statistics Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects	0 29 2
726 727 728 729 730 731 732 733 734 735 736 737 738 739 740	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variabl FLUORIDE (mg/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect	d other statistic specific v e ETHYLBE General 44 7 15 6 0.12	Stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV) ENZENE (mg/L) was not processed! Statistics Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect	0 29 2 0.2
726 727 728 729 730 731 732 733 734 735 736 737 738 739 739 740 741	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variable FLUORIDE (mg/L) Total Number of Observations Number of Distinct Observations Number of Detects Number of Distinct Detects Minimum Detect Maximum Detect	d other statis te specific v e ETHYLBE General 44 7 15 6 0.12 0.24	Stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV) INZENE (mg/L) was not processed! Statistics Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Maximum Non-Detect	0 29 2 0.2 0.5
726 727 728 729 730 731 732 733 733 734 735 736 737 738 739 740 741 742	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variabl FLUORIDE (mg/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect	d other statis te specific v e ETHYLBE General 44 7 15 6 0.12 0.24 0.00157	Stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV) NZENE (mg/L) was not processed! Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Maximum Non-Detect Percent Non-Detects	0 29 2 0.2 0.5 65.91%
726 727 728 729 730 731 732 733 734 735 736 736 737 738 739 739 740 741 742 743	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variabl FLUORIDE (mg/L) Total Number of Observations Number of Distinct Observations Number of Distinct Observations Number of Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected	d other statis te specific v e ETHYLBE General 44 7 15 6 0.12 0.24 0.24 0.00157 0.157	stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV) NZENE (mg/L) was not processed! Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Maximum Non-Detect Percent Non-Detects SD Detected	0 29 2 0.2 0.5 65.91% 0.0396
726 727 728 729 730 731 732 733 734 735 736 737 736 737 738 739 740 741 742 743 744	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variable FLUORIDE (mg/L) Total Number of Observations Number of Distinct Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data	d other statis te specific v e ETHYLBE General 44 7 15 6 0.12 0.24 0.00157 0.157 -1.881	stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV) NZENE (mg/L) was not processed! Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Maximum Non-Detect Percent Non-Detects SD Detected	0 29 2 0.2 0.5 65.91% 0.0396
726 727 728 729 730 731 732 733 734 735 736 737 736 737 738 739 740 741 742 742 743 744 745	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variable FLUORIDE (mg/L) Total Number of Observations Number of Distinct Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data	d other statis te specific v e ETHYLBE General 44 7 15 6 0.12 0.24 0.00157 0.157 -1.881	Stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV) NZENE (mg/L) was not processed! Statistics Number of Missing Observations Number of Non-Detects Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Maximum Non-Detect Percent Non-Detects SD Detected SD of Detected Logged Data	0 29 2 0.2 0.5 65.91% 0.0396
726 727 728 729 730 731 732 733 734 735 736 737 736 737 738 739 740 741 742 743 744 745 746	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variable FLUORIDE (mg/L) Total Number of Observations Number of Distinct Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data	d other statis te specific v e ETHYLBE General 44 7 15 6 0.12 0.24 0.00157 0.157 -1.881	stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV) INZENE (mg/L) was not processed! Statistics Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Maximum Non-Detect Percent Non-Detects SD Detected SD of Detected Logged Data and Threshold Values (BTVs)	0 29 2 0.2 0.5 65.91% 0.0396 0.237
726 727 728 729 730 731 732 733 734 735 736 737 736 737 738 739 740 741 742 743 744 745 746 747	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variable FLUORIDE (mg/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Of Detected Logged Data Critical Values for Tolerance Factor K (For UTL)	d other statis te specific v e ETHYLBE General 44 7 15 6 0.12 0.24 0.00157 0.157 -1.881 or Backgrou 2.091	stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV) INZENE (mg/L) was not processed! Statistics Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Maximum Non-Detect Percent Non-Detects SD Detected SD of Detected Logged Data and Threshold Values (BTVs)	0 29 2 0.2 0.5 65.91% 0.0396 0.237
726 727 728 729 730 731 732 733 734 735 736 737 738 736 737 738 739 740 741 742 743 744 745 746 747 748	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variable FLUORIDE (mg/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Of Detected Logged Data Critical Values fo Tolerance Factor K (For UTL)	d other statis te specific v e ETHYLBE General 44 7 15 6 0.12 0.24 0.00157 0.157 -1.881 or Backgrou 2.091	stics are also NDs lying below the largest detection limit! alues to estimate environmental parameters (e.g., EPC, BTV) NZENE (mg/L) was not processed! Statistics Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Maximum Non-Detect Percent Non-Detects SD Detected SD of Detected Logged Data nd Threshold Values (BTVs) d2max (for USL)	0 29 2 0.2 0.5 65.91% 0.0396 0.237
726 727 728 729 730 731 732 733 734 735 736 737 736 737 738 739 740 741 742 743 744 745 746 747	Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si The data set for variable FLUORIDE (mg/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Of Detected Logged Data Critical Values for Tolerance Factor K (For UTL)	d other statis te specific v e ETHYLBE General 44 7 15 6 0.12 0.24 0.00157 0.157 -1.881 or Backgrou 2.091 al GOF Tes	stics are also NDs lying below the largest detection limit! ralues to estimate environmental parameters (e.g., EPC, BTV) NZENE (mg/L) was not processed! Statistics Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Maximum Non-Detect Percent Non-Detects SD Detected SD of Detected Logged Data nd Threshold Values (BTVs) d2max (for USL)	0 29 2 0.2 0.5 65.91% 0.0396 0.237

	A B C D E	F	G H I J K	L
751	Lilliefors Test Statistic	0.263	Lilliefors GOF Test	
752	5% Lilliefors Critical Value	0.22	Data Not Normal at 5% Significance Level	
753	Data Not	Normal at 5	% Significance Level	
754				
755	Kaplan Meier (KM) Bacl	kground Sta	tistics Assuming Normal Distribution	
756	KM Mean	0.143	KM SD	0.0299
757	95% UTL95% Coverage	0.206	95% KM UPL (t)	0.194
758	90% KM Percentile (z)	0.181	95% KM Percentile (z)	0.192
759	99% KM Percentile (z)	0.213	95% KM USL	0.23
760				
761	DL/2 Substitution Back	ground Stati	istics Assuming Normal Distribution	
762	Mean	0.16	SD	0.0648
763	95% UTL95% Coverage	0.296	95% UPL (t)	0.27
764	90% Percentile (z)	0.243	95% Percentile (z)	0.267
765	99% Percentile (z)	0.311	95% USL	0.349
766	DL/2 is not a recommended meth	od. DL/2 pro	ovided for comparisons and historical reasons	
767				
768	Gamma GOF	Tests on De	etected Observations Only	
769	A-D Test Statistic	1.282	Anderson-Darling GOF Test	
770	5% A-D Critical Value	0.735	Data Not Gamma Distributed at 5% Significance Lev	el
771	K-S Test Statistic	0.254	Kolmogorov-Smirnov GOF	
772	5% K-S Critical Value	0.221	Data Not Gamma Distributed at 5% Significance Lev	el
773	Data Not Gamr	na Distribute	ed at 5% Significance Level	
774				
775	Gamma	Statistics or	n Detected Data Only	
776	k hat (MLE)	18.4	k star (bias corrected MLE)	14.76
777	Theta hat (MLE)	0.00852	Theta star (bias corrected MLE)	0.0106
778	nu hat (MLE)	551.9	nu star (bias corrected)	442.9
779	MLE Mean (bias corrected)	0.157		
780	MLE Sd (bias corrected)	0.0408	95% Percentile of Chisquare (2kstar)	43.19
781			1	
782	Gamma ROS	Statistics u	sing Imputed Non-Detects	
783	GROS may not be used when data so	et has > 50%	6 NDs with many tied observations at multiple DLs	
784	GROS may not be used when kstar of detects is s	small such a	s <1.0, especially when the sample size is small (e.g., <15-20)	
785	For such situations, GROS r	method may	yield incorrect values of UCLs and BTVs	
786	This is especi	ally true whe	en the sample size is small.	
787	For gamma distributed detected data, BTVs a	nd UCLs ma	y be computed using gamma distribution on KM estimates	
788	Minimum	0.0917	Mean	0.145
789	Maximum	0.24	Median	0.139
790	SD	0.0321	CV	0.221
791	k hat (MLE)	22.39	k star (bias corrected MLE)	20.88
792	Theta hat (MLE)	0.00647	Theta star (bias corrected MLE)	0.00694
793	nu hat (MLE)	1971	nu star (bias corrected)	1838
794	MLE Mean (bias corrected)	0.145	MLE Sd (bias corrected)	0.0317
795	95% Percentile of Chisquare (2kstar)	57.85	90% Percentile	0.187
796	95% Percentile	0.201	99% Percentile	0.229
797	The following statistics are co	mputed usin	g Gamma ROS Statistics on Imputed Data	
798	Upper Limits using Wilson	h Hilferty (W	H) and Hawkins Wixley (HW) Methods	
799	WH	HW	WH	HW
800	95% Approx. Gamma UTL with 95% Coverage 0.217	0.218	95% Approx. Gamma UPL 0.201	0.202
800				

—	A B C D	E	F	G H I J K				
801	95% Gamma USL	0.252	0.254		L			
802	Estima	ates of G	amma Para	neters using KM Estimates				
803		ean (KM)	0.143	SD (KM)				
804			8.9675E-4	SE of Mean (KM)	0.0299			
805		hat (KM)	22.81	k star (KM)	21.27			
806		hat (KM)	2008	nu star (KM)	1872			
807		hat (KM)	0.00627	theta star (KM)	0.00672			
808	90% commo porcontilo (KM)			90% gamma percentile (KM)	0.184			
809	QE% gamma porcentilo (KM)			99% gamma percentile (KM)	0.225			
810				, , , , , , , , , , , , , , , , , , ,				
811	The following statist	tics are c	omputed usi	ng gamma distribution and KM estimates				
812	•		•	H) and Hawkins Wixley (HW) Methods				
813		WH	HW	, <u> </u>	HW			
814		0.205	0.206	95% Approx. Gamma UPL 0.192	0.192			
815	95% KM Gamma Percentile	0.19	0.200	95% Gamma USL 0.235	0.236			
816		0.10	5.10		0.200			
817	Loand	ormal GO	F Test on D	etected Observations Only				
818	Shapiro Wilk Test		0.828	Shapiro Wilk GOF Test				
819	5% Shapiro Wilk Critic		0.881	Data Not Lognormal at 5% Significance Level				
820	Lilliefors Test		0.24	Lilliefors GOF Test				
821	5% Lilliefors Critic		0.22	Data Not Lognormal at 5% Significance Level				
822			-	5% Significance Level				
823			.ognormar ar					
824	Background Lognormal ROS	Statistics	Assumina	ognormal Distribution Using Imputed Non-Detects				
825	Mean in Origin		0.145	Mean in Log Scale	-1.95			
826	SD in Origin		0.0306	SD in Log Scale				
827	95% UTL95% C		0.215	95% BCA UTL95% Coverage	0.198			
828	95% Bootstrap (%) UTL95% C	Ũ	0.234	95% UPL (t)				
829	90% Perc	-	0.183	95% Percentile (z)	0.199			
830	99% Perc	. ,	0.226	95% USL	0.253			
831		(<u></u>)	0.220		0.200			
832	Statistics using KM e	stimates	on Loaaed I	Data and Assuming Lognormal Distribution				
833	KM Mean of Log		-1.963	95% KM UTL (Lognormal)95% Coverage	0.206			
834	KM SD of Logg	-	0.182	95% KM UPL (Lognormal)				
835	95% KM Percentile Logn	-	0.19	95% KM USL (Lognormal)				
836		- (-)						
837	Backorou	Ind DL/2	Statistics As	suming Lognormal Distribution				
838	Mean in Origin		0.16	Mean in Log Scale	-1.909			
839	SD in Origin		0.0648	SD in Log Scale				
840	95% UTL95% C		0.339	95% UPL (t)				
841	90% Perc	-	0.246	95% Percentile (z)				
842	99% Perc	. ,	0.372	95% USL	0.467			
843		. ,		vided for comparisons and historical reasons.				
844	/2 //		P''	· · · · ·				
845	Nonpa	arametric	Distribution	Free Background Statistics				
846				ernible Distribution (0.05)				
847								
848	Nonparametric Upper Lin	mits for B	TVs(no disti	nction made between detects and nondetects)				
849	Order of S		44	95% UTL with95% Coverage	0.5			
850			• T		0.0			

	A B C D E	F	G H I J K	1
851	Approx, f used to compute achieved CC	2.316	Approximate Actual Confidence Coefficient achieved by UTL	0.895
852	Approximate Sample Size needed to achieve specified CC	59	95% UPL	0.5
853	95% USL	0.5	95% KM Chebyshev UPL	0.275
854			· · · · · ·	
855	Note: The use of USL tends to yield a conservative	ve estimate	of BTV, especially when the sample size starts exceeding 20.	
856			ne data set represents a background data set free of outliers	
857			ted from clean unimpacted locations.	
858			false positives and false negatives provided the data	
859	represents a background data set and wh	en many or	nsite observations need to be compared with the BTV.	
860				
861	IRON, TOTAL (mg/L)			
862				
863			Statistics	
864	Total Number of Observations	43	Number of Missing Observations	0
865	Number of Distinct Observations	11		
866	Number of Detects	14	Number of Non-Detects	29
867	Number of Distinct Detects	10	Number of Distinct Non-Detects	1
868	Minimum Detect	0.07	Minimum Non-Detect	0.06
869	Maximum Detect	0.37	Maximum Non-Detect Percent Non-Detects	0.06
870	Variance Detected Mean Detected	0.00841	SD Detected	67.44% 0.0917
871	Mean of Detected Logged Data	-1.947	SD Detected SD of Detected Logged Data	0.0917
872	weat of Detected Logged Data	-1.947	SD of Delected Logged Data	0.402
873	Critical Values fo	r Backgrou	nd Threshold Values (BTVs)	
874	Tolerance Factor K (For UTL)	2.097	d2max (for USL)	2.897
875		2.007		2.007
876	Norm	al GOF Tes	t on Detects Only	
877	Shapiro Wilk Test Statistic	0.773	Shapiro Wilk GOF Test	
878	5% Shapiro Wilk Critical Value	0.874	Data Not Normal at 5% Significance Level	
879	Lilliefors Test Statistic	0.304	Lilliefors GOF Test	
880 881	5% Lilliefors Critical Value	0.226	Data Not Normal at 5% Significance Level	
882	Data Not	Normal at 5	5% Significance Level	
883				
884	Kaplan Meier (KM) Back	ground Sta	tistics Assuming Normal Distribution	
885	KM Mean	0.0928	KM SD	0.0691
886	95% UTL95% Coverage	0.238	95% KM UPL (t)	0.21
887	90% KM Percentile (z)	0.181	95% KM Percentile (z)	0.206
888	99% KM Percentile (z)	0.253	95% KM USL	0.293
889			r I	
890	DL/2 Substitution Backg	round Stat	istics Assuming Normal Distribution	
891	Mean	0.0726	SD	0.0803
892	95% UTL95% Coverage	0.241	95% UPL (t)	0.209
893	90% Percentile (z)	0.175	95% Percentile (z)	0.205
894	99% Percentile (z)	0.259	95% USL	0.305
895	DL/2 is not a recommended metho	od. DL/2 pro	ovided for comparisons and historical reasons	
896				
897			etected Observations Only	
898	A-D Test Statistic	0.765	Anderson-Darling GOF Test	
899	5% A-D Critical Value	0.739	Data Not Gamma Distributed at 5% Significance Leve	
900	K-S Test Statistic	0.262	Kolmogorov-Smirnov GOF	

	A B C D	E	F	G H I J K	1	
901		ritical Value	0.23	Data Not Gamma Distributed at 5% Significance Lev	el	
902	Da	ta Not Gamm	na Distribute	ed at 5% Significance Level		
903						
904		Gamma	Statistics on	Detected Data Only		
905		k hat (MLE)	4.354	k star (bias corrected MLE)		
906	Thet	a hat (MLE)	0.0369	Theta star (bias corrected MLE)	0.0463	
907	n	u hat (MLE)	121.9	nu star (bias corrected)	97.12	
908	MLE Mean (bia	s corrected)	0.161			
909	MLE Sd (bias	s corrected)	0.0863	95% Percentile of Chisquare (2kstar)	13.98	
910						
911	G	iamma ROS	Statistics us	sing Imputed Non-Detects		
912	GROS may not be used	when data se	et has > 50%	NDs with many tied observations at multiple DLs		
913	GROS may not be used when kstar of	of detects is s	mall such as	s <1.0, especially when the sample size is small (e.g., <15-20)		
914	For such situation	ons, GROS n	nethod may	yield incorrect values of UCLs and BTVs		
915	Т	his is especia	ally true whe	n the sample size is small.		
916	For gamma distributed detected of	data, BTVs ar	nd UCLs ma	y be computed using gamma distribution on KM estimates		
917		Minimum	0.01	Mean	0.0607	
918		Maximum	0.37	Median	0.01	
919		SD	0.0871	CV	1.434	
920		k hat (MLE)	0.709	k star (bias corrected MLE)	0.675	
921	Thet	a hat (MLE)	0.0856	Theta star (bias corrected MLE)	0.0899	
922	n	u hat (MLE)	61.01	nu star (bias corrected)	58.08	
923	MLE Mean (bia	s corrected)	0.0607	MLE Sd (bias corrected)	0.0739	
924	95% Percentile of Chisqu	are (2kstar)	4.657	90% Percentile	0.154	
925	95%	6 Percentile	0.209	99% Percentile	0.343	
926	The following stati	stics are con	nputed using	g Gamma ROS Statistics on Imputed Data		
927	Upper Limits u	using Wilson	Hilferty (WI	H) and Hawkins Wixley (HW) Methods		
928		WH	HW	WH	HW	
929	95% Approx. Gamma UTL with 95% Coverage	0.272	0.286	95% Approx. Gamma UPL 0.203		
930	95% Gamma USL	0.459	0.519		0.205	
					0.205	
931					0.205	
931 932				meters using KM Estimates		
		Mean (KM)	0.0928	SD (KM)	0.0691	
932		Mean (KM) riance (KM)	0.0928 0.00477	SD (KM) SE of Mean (KM)	0.0691	
932 933	Va	Mean (KM) riance (KM) k hat (KM)	0.0928 0.00477 1.805	SD (KM) SE of Mean (KM) k star (KM)	0.0691 0.0109 1.695	
932 933 934	Va	Mean (KM) riance (KM) k hat (KM) nu hat (KM)	0.0928 0.00477 1.805 155.3	SD (KM) SE of Mean (KM) k star (KM) nu star (KM)	0.0691 0.0109 1.695 145.8	
932 933 934 935	Va	Mean (KM) riance (KM) k hat (KM) nu hat (KM) eta hat (KM)	0.0928 0.00477 1.805 155.3 0.0514	SD (KM) SE of Mean (KM) k star (KM) nu star (KM) theta star (KM)	0.0691 0.0109 1.695 145.8 0.0547	
932 933 934 935 936	Va the 80% gamma per	Mean (KM) riance (KM) k hat (KM) nu hat (KM) eta hat (KM) centile (KM)	0.0928 0.00477 1.805 155.3 0.0514 0.142	SD (KM) SE of Mean (KM) k star (KM) nu star (KM) theta star (KM) 90% gamma percentile (KM)	0.0691 0.0109 1.695 145.8 0.0547 0.188	
932 933 934 935 936 937	Va	Mean (KM) riance (KM) k hat (KM) nu hat (KM) eta hat (KM) centile (KM)	0.0928 0.00477 1.805 155.3 0.0514	SD (KM) SE of Mean (KM) k star (KM) nu star (KM) theta star (KM)	0.0691 0.0109 1.695 145.8 0.0547	
932 933 934 935 936 937 938	Va the 80% gamma pere 95% gamma pere	Mean (KM) riance (KM) k hat (KM) nu hat (KM) eta hat (KM) centile (KM) centile (KM)	0.0928 0.00477 1.805 155.3 0.0514 0.142 0.232	SD (KM) SE of Mean (KM) k star (KM) nu star (KM) theta star (KM) 90% gamma percentile (KM) 99% gamma percentile (KM)	0.0691 0.0109 1.695 145.8 0.0547 0.188	
932 933 934 935 936 937 938 939	Va the 80% gamma pero 95% gamma pero The following sta	Mean (KM) riance (KM) k hat (KM) nu hat (KM) eta hat (KM) centile (KM) centile (KM)	0.0928 0.00477 1.805 155.3 0.0514 0.142 0.232	SD (KM) SE of Mean (KM) k star (KM) nu star (KM) theta star (KM) 90% gamma percentile (KM) 99% gamma percentile (KM) ng gamma distribution and KM estimates	0.0691 0.0109 1.695 145.8 0.0547 0.188	
932 933 934 935 936 937 938 939 940	Va the 80% gamma pero 95% gamma pero The following sta	Mean (KM) riance (KM) k hat (KM) nu hat (KM) eta hat (KM) centile (KM) centile (KM) tistics are co using Wilson	0.0928 0.00477 1.805 155.3 0.0514 0.142 0.232 omputed usi Hilferty (WI	SD (KM) SE of Mean (KM) k star (KM) nu star (KM) theta star (KM) 90% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma percentile (KM)	0.0691 0.0109 1.695 145.8 0.0547 0.188 0.332	
932 933 934 935 936 937 938 939 940 941	Va the 80% gamma pero 95% gamma pero The following sta Upper Limits o	Mean (KM) riance (KM) k hat (KM) nu hat (KM) eta hat (KM) centile (KM) centile (KM) tistics are co using Wilson WH	0.0928 0.00477 1.805 155.3 0.0514 0.142 0.232 mputed usi Hilferty (WI HW	SD (KM) SE of Mean (KM) k star (KM) nu star (KM) theta star (KM) 90% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma percentile (KM) H) and Hawkins Wixley (HW) Methods	0.0691 0.0109 1.695 145.8 0.0547 0.188 0.332	
932 933 934 935 936 937 938 939 940 941 942	Va the 80% gamma pero 95% gamma pero The following sta Upper Limits o 95% Approx. Gamma UTL with 95% Coverage	Mean (KM) riance (KM) k hat (KM) nu hat (KM) eta hat (KM) centile (KM) centile (KM) tistics are co using Wilson WH 0.223	0.0928 0.00477 1.805 155.3 0.0514 0.142 0.232 omputed usi Hilferty (WI HW 0.222	SD (KM) SE of Mean (KM) k star (KM) nu star (KM) theta star (KM) 90% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma Dercentile (KM) 99% gamma Dercentile (KM) 99% gamma Dercentile (KM) 99% gamma Dercentile (KM) 99% Approx. Gamma UPL 0.19	0.0691 0.0109 1.695 145.8 0.0547 0.188 0.332 HW 0.187	
932 933 934 935 936 937 938 939 940 941 942 943	Va the 80% gamma pero 95% gamma pero The following sta Upper Limits o	Mean (KM) riance (KM) k hat (KM) nu hat (KM) eta hat (KM) centile (KM) centile (KM) tistics are co using Wilson WH	0.0928 0.00477 1.805 155.3 0.0514 0.142 0.232 mputed usi Hilferty (WI HW	SD (KM) SE of Mean (KM) k star (KM) nu star (KM) theta star (KM) 90% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma percentile (KM) H) and Hawkins Wixley (HW) Methods	0.0691 0.0109 1.695 145.8 0.0547 0.188 0.332	
932 933 934 935 936 937 938 939 940 941 941 942 943 944	Va the 80% gamma pero 95% gamma pero The following sta Upper Limits of 95% Approx. Gamma UTL with 95% Coverage 95% KM Gamma Percentile	Mean (KM) riance (KM) k hat (KM) nu hat (KM) eta hat (KM) centile (KM) centile (KM) tistics are co using Wilson WH 0.223 0.185	0.0928 0.00477 1.805 155.3 0.0514 0.142 0.232 omputed usi Hilferty (WI HW 0.222 0.183	SD (KM) SE of Mean (KM) k star (KM) nu star (KM) theta star (KM) 90% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma Dercentile (KM) 99% gamma Dercentile (KM) 99% gamma Dercentile (KM) 99% gamma Dercentile (KM) 99% Gamma UPL 0.19 95% Gamma USL 0.303	0.0691 0.0109 1.695 145.8 0.0547 0.188 0.332 HW 0.187	
932 933 934 935 936 937 938 939 940 941 942 943 944 945	Va the 80% gamma per 95% gamma per 95% Approx. Gamma UTL with 95% Coverage 95% KM Gamma Percentile	Mean (KM) riance (KM) k hat (KM) nu hat (KM) eta hat (KM) centile (KM) centile (KM) tistics are co using Wilson WH 0.223 0.185 gnormal GO	0.0928 0.00477 1.805 155.3 0.0514 0.142 0.232 mputed usi Hilferty (WI HW 0.222 0.183	SD (KM) SE of Mean (KM) k star (KM) nu star (KM) theta star (KM) 90% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma Dercentile (KM)	0.0691 0.0109 1.695 145.8 0.0547 0.188 0.332 HW 0.187	
932 933 934 935 936 937 938 939 940 941 942 943 944 945 946	Va the 80% gamma pero 95% gamma pero 95% Approx. Gamma UTL with 95% Coverage 95% KM Gamma Percentile Lo Shapiro Wilk T	Mean (KM) riance (KM) k hat (KM) nu hat (KM) eta hat (KM) centile (KM) centile (KM) centile (KM) tistics are co using Wilson WH 0.223 0.185 gnormal GO	0.0928 0.00477 1.805 155.3 0.0514 0.142 0.232 omputed usi Hilferty (WI HW 0.222 0.183 F Test on D 0.917	SD (KM) SE of Mean (KM) k star (KM) nu star (KM) theta star (KM) 90% gamma percentile (KM) 99% gamma Dercentile (KM) 90% g	0.0691 0.0109 1.695 145.8 0.0547 0.188 0.332 HW 0.187 0.307	
932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947	Va the 80% gamma pero 95% gamma pero 95% Approx. Gamma UTL with 95% Coverage 95% KM Gamma Percentile Lo Shapiro Wilk T 5% Shapiro Wilk C	Mean (KM) riance (KM) k hat (KM) nu hat (KM) eta hat (KM) centile (KM) centile (KM) centile (KM) tistics are co using Wilson WH 0.223 0.185 gnormal GO	0.0928 0.00477 1.805 155.3 0.0514 0.142 0.232 mputed usi Hilferty (WI HW 0.222 0.183	SD (KM) SE of Mean (KM) k star (KM) nu star (KM) theta star (KM) 90% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma percentile (KM) 99% gamma Dercentile (KM)	0.0691 0.0109 1.695 145.8 0.0547 0.188 0.332 HW 0.187 0.307	

	A B C D E	F	G H I J K	1
951	5% Lilliefors Critical Value	0.226	Data Not Lognormal at 5% Significance Level	L
	Detected Data appear A	pproximate	Lognormal at 5% Significance Level	
952 953				
953 954	Background Lognormal ROS Statistics	Assuming	Lognormal Distribution Using Imputed Non-Detects	
	Mean in Original Scale	0.0745	Mean in Log Scale	-3.062
955	SD in Original Scale	0.0806	SD in Log Scale	0.99
956	95% UTL95% Coverage	0.373	95% BCA UTL95% Coverage	0.353
957	95% Bootstrap (%) UTL95% Coverage	0.368	95% UPL (t)	0.252
958	90% Percentile (z)	0.166	95% Percentile (z)	0.238
959	99% Percentile (z)	0.468	95% USL	0.824
960				
961	Statistics using KM estimates	on Loaaed I	Data and Assuming Lognormal Distribution	
962	KM Mean of Logged Data	-2.531	95% KM UTL (Lognormal)95% Coverage	0.22
963	KM SD of Logged Data	0.485	95% KM UPL (Lognormal)	0.181
964	95% KM Percentile Lognormal (z)	0.177	95% KM USL (Lognormal)	0.324
965		0.177		0.024
966	Background DI /2 9	Statistics As	suming Lognormal Distribution	
967	Mean in Original Scale	0.0726	Mean in Log Scale	-2.999
968	SD in Original Scale	0.0803	SD in Log Scale	0.786
969	95% UTL95% Coverage	0.259	95% UPL (t)	0.19
970	90% Percentile (z)	0.239	95% Percentile (z)	0.19
971	90% Percentile (z) 99% Percentile (z)	0.137	95% Percentile (2) 95% USL	0.182
972			by ded for comparisons and historical reasons.	0.460
973			ovided for comparisons and historical reasons.	
974	Neuroremetrie	Distribution	Free Background Statistics	
975			Distribution at 5% Significance Level	
976		Discernible		
977				
1 1	Nonnaramatria Unnar Limita for B		notion made between detects and pendetects)	
978		•	nction made between detects and nondetects)	0.37
979	Order of Statistic, r	43	95% UTL with95% Coverage	0.37
979 980	Order of Statistic, r Approx, f used to compute achieved CC	43 2.263	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL	0.89
979 980 981	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC	43 2.263 59	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL	0.89 0.32
979 980 981 982	Order of Statistic, r Approx, f used to compute achieved CC	43 2.263	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL	0.89
979 980 981 982 983	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL	43 2.263 59 0.37	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL	0.89 0.32
979 980 981 982	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservation	43 2.263 59 0.37 ve estimate	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20.	0.89 0.32
979 980 981 982 983	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservatir Therefore, one may use USL to estimate a BTV	43 2.263 59 0.37 ve estimate only when th	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20.	0.89 0.32
979 980 981 982 983 984 985 986	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa	43 2.263 59 0.37 ve estimate only when th tions collect	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ed from clean unimpacted locations.	0.89 0.32
979 980 981 982 983 984 985 986 987	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan	43 2.263 59 0.37 ve estimate only when th tions collect ice between	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data	0.89 0.32
979 980 981 982 983 984 985 986	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan	43 2.263 59 0.37 ve estimate only when th tions collect ice between	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ed from clean unimpacted locations.	0.89 0.32
979 980 981 982 983 984 985 986 987 988 988	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh	43 2.263 59 0.37 ve estimate only when th tions collect ice between	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data	0.89 0.32
979 980 981 982 983 984 985 986 987 988 989	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan	43 2.263 59 0.37 ve estimate only when th tions collect ice between	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data	0.89 0.32
979 980 981 982 983 984 985 986 987 988 988 989 989 990	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservatir Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wf MAGNESIUM, TOTAL (mg/L)	43 2.263 59 0.37 ve estimate only when th tions collect ice between	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data	0.89 0.32
979 980 981 982 983 984 985 986 986 987 988 989 989 990 991	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservatir Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh MAGNESIUM, TOTAL (mg/L) General Statistics	43 2.263 59 0.37 ve estimate only when th tions collect ice between hen many or	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data isite observations need to be compared with the BTV.	0.89 0.32 0.397
979 980 981 982 983 984 985 986 987 988 988 989 989 990	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wi MAGNESIUM, TOTAL (mg/L) General Statistics Total Number of Observations	43 2.263 59 0.37 ve estimate only when th tions collect ace between men many or 42	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. The data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data site observations need to be compared with the BTV.	0.89 0.32 0.397
979 980 981 982 983 984 985 986 986 987 988 989 990 991 991 992	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservatir Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and with MAGNESIUM, TOTAL (mg/L) General Statistics Total Number of Observations Minimum	43 2.263 59 0.37 ve estimate only when the tions collect ice between hen many or 42 7.6	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data isite observations need to be compared with the BTV.	0.89 0.32 0.397
979 980 981 982 983 984 985 986 987 988 989 989 990 990 991 992 993	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wf MAGNESIUM, TOTAL (mg/L) General Statistics Total Number of Observations Minimum Second Largest	43 2.263 59 0.37 ve estimate only when th tions collect ace between nen many or 42 7.6 10.4	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. The data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data risite observations need to be compared with the BTV.	0.89 0.32 0.397
979 980 981 982 983 984 985 986 987 988 988 989 989 990 991 992 993 994	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservatir Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and with MAGNESIUM, TOTAL (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum	43 2.263 59 0.37 ve estimate only when the tions collect tice between then many or 42 7.6 10.4 10.6	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data isite observations need to be compared with the BTV.	0.89 0.32 0.397
979 980 981 982 983 984 985 986 987 988 989 990 991 991 992 993 994 995	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh MAGNESIUM, TOTAL (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum	43 2.263 59 0.37 ve estimate only when th tions collect ice between nen many or 42 7.6 10.4 10.6 8.988	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data risite observations need to be compared with the BTV.	0.89 0.32 0.397
979 980 981 982 983 984 985 986 987 988 988 989 9980 9990 991 992 991 992 993 994	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wi MAGNESIUM, TOTAL (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation	43 2.263 59 0.37 ve estimate only when the tions collect tice between then many or 42 7.6 10.4 10.6 8.988 0.0749	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data isite observations need to be compared with the BTV. Number of Distinct Observations First Quartile Median Third Quartile SD Skewness	0.89 0.32 0.397
979 980 981 982 983 984 985 986 987 988 989 990 991 992 991 992 993 994 995 996 997	Order of Statistic, r Approx, f used to compute achieved CC Approximate Sample Size needed to achieve specified CC 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh MAGNESIUM, TOTAL (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum	43 2.263 59 0.37 ve estimate only when th tions collect ice between nen many or 42 7.6 10.4 10.6 8.988	95% UTL with95% Coverage Approximate Actual Confidence Coefficient achieved by UTL 95% UPL 95% KM Chebyshev UPL of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ed from clean unimpacted locations. false positives and false negatives provided the data risite observations need to be compared with the BTV.	0.89 0.32 0.397

	A B C D E	F	G H I J K	L
1001		-	nd Threshold Values (BTVs)	0.007
1002	Tolerance Factor K (For UTL)	2.104	d2max (for USL)	2.887
1003				
1004			GOF Test	
1005	Shapiro Wilk Test Statistic	0.939	Shapiro Wilk GOF Test	
1006	5% Shapiro Wilk Critical Value	0.942	Data Not Normal at 5% Significance Level	
1007	Lilliefors Test Statistic	0.0882	Lilliefors GOF Test	
1008	5% Lilliefors Critical Value	0.135	Data appear Normal at 5% Significance Level	
1009	Data appear App	roximate No	rmal at 5% Significance Level	
1010				
1011	_		uming Normal Distribution	
1012	95% UTL with 95% Coverage	10.4	90% Percentile (z)	9.85
1013	95% UPL (t)	10.13	95% Percentile (z)	10.09
1014	95% USL	10.93	99% Percentile (z)	10.55
1015				
1016		Gamma	GOF Test	
1017	A-D Test Statistic	0.235	Anderson-Darling Gamma GOF Test	
1018	5% A-D Critical Value	0.747	Detected data appear Gamma Distributed at 5% Significan	ce Level
1019	K-S Test Statistic	0.0783	Kolmogorov-Smirnov Gamma GOF Test	
1020	5% K-S Critical Value	0.136	Detected data appear Gamma Distributed at 5% Significan	ce Level
1021	Detected data appear	r Gamma Di	stributed at 5% Significance Level	
1022				
1023		Gamma	Statistics	
1024	k hat (MLE)	183.3	k star (bias corrected MLE)	170.3
1025	Theta hat (MLE)	0.049	Theta star (bias corrected MLE)	0.0528
1026	nu hat (MLE)	15400	nu star (bias corrected)	14301
1027	MLE Mean (bias corrected)	8.988	MLE Sd (bias corrected)	0.689
1028				
1029	Background S	tatistics Ass	uming Gamma Distribution	
1030	95% Wilson Hilferty (WH) Approx. Gamma UPL	10.16	90% Percentile	9.881
1031	95% Hawkins Wixley (HW) Approx. Gamma UPL	10.17	95% Percentile	10.15
1032	95% WH Approx. Gamma UTL with 95% Coverage	10.46	99% Percentile	10.67
1033	95% HW Approx. Gamma UTL with 95% Coverage	10.47		
1034	95% WH USL	11.05	95% HW USL	11.07
1035				
1036		Lognorma	GOF Test	
1037	Shapiro Wilk Test Statistic	0.941	Shapiro Wilk Lognormal GOF Test	
1038	5% Shapiro Wilk Critical Value	0.942	Data Not Lognormal at 5% Significance Level	
1039	Lilliefors Test Statistic	0.0736	Lilliefors Lognormal GOF Test	
1033	5% Lilliefors Critical Value	0.135	Data appear Lognormal at 5% Significance Level	
1040	Data appear Appro	ximate Logn	ormal at 5% Significance Level	
1042				
1042	Background Sta	atistics assu	ming Lognormal Distribution	
1043	95% UTL with 95% Coverage	10.49	90% Percentile (z)	9.865
1045	95% UPL (t)	10.18	95% Percentile (z)	10.14
	95% USL	11.12	99% Percentile (z)	10.67
1046		<u> </u>	ļ, ,	
1047	Nonparametric	Distribution	Free Background Statistics	
1048			rmal at 5% Significance Level	
1049			•	
1050				

	A B C D E	F	G H I J K	L
1051	-	-	r Background Threshold Values	
1052	Order of Statistic, r	42	95% UTL with 95% Coverage	10.6
1052	Approx, f used to compute achieved CC	2.211	Approximate Actual Confidence Coefficient achieved by UTL	0.884
1055			Approximate Sample Size needed to achieve specified CC	59
1054	95% Percentile Bootstrap UTL with 95% Coverage	10.59	95% BCA Bootstrap UTL with 95% Coverage	10.57
1055	95% UPL	10.34	90% Percentile	9.7
1057	90% Chebyshev UPL	11.03	95% Percentile	9.99
1057	95% Chebyshev UPL	11.96	99% Percentile	10.52
1059	95% USL	10.6		
1060				
1061	Note: The use of USL tends to yield a conservati	ve estimate	of BTV, especially when the sample size starts exceeding 20.	
1062	Therefore, one may use USL to estimate a BTV	only when th	ne data set represents a background data set free of outliers	
1062			ed from clean unimpacted locations.	
1063	The use of USL tends to provide a balar	nce between	false positives and false negatives provided the data	
			site observations need to be compared with the BTV.	
1065 1066			· · · ·	
1066	MANGANESE, TOTAL (mg/L)			
1067				
1068	General Statistics			
	Total Number of Observations	36	Number of Distinct Observations	11
1070	Minimum	0.23	First Quartile	0.26
1071	Second Largest	0.33	Median	0.27
1072	Maximum	0.34	Third Quartile	0.29
1073	Mean	0.277	SD	0.0293
1074	Coefficient of Variation	0.106	Skewness	0.642
1075 1076	Moon of logged Data	-1.288	SD of logged Data	0.104
1076				
1077	Critical Values f	or Backgrou	nd Threshold Values (BTVs)	
1078	Tolerance Factor K (For UTL)	2.148	d2max (for USL)	2.824
1075				
1080		Normal (GOF Test	
1081	Shapiro Wilk Test Statistic	0.919	Shapiro Wilk GOF Test	
1083	5% Shapiro Wilk Critical Value	0.935	Data Not Normal at 5% Significance Level	
1083	Lilliefors Test Statistic	0.166	Lilliefors GOF Test	
1085	5% Lilliofors Critical Value	0.145	Data Not Normal at 5% Significance Level	
1085	Data Not	Normal at 5	i% Significance Level	
1087				
1087	Background S	tatistics Ass	uming Normal Distribution	
1089	95% LITL with 95% Coverage	0.34	90% Percentile (z)	0.315
1005	05% UDL (t)	0.327	95% Percentile (z)	0.325
1091	95% USL	0.36	99% Percentile (z)	0.345
1092		L		
1093		Gamma	GOF Test	
1093	A-D Test Statistic	0.925	Anderson-Darling Gamma GOF Test	
1095	5% A D Critical Value	0.746	Data Not Gamma Distributed at 5% Significance Level	
1095	K S Test Statistic	0.165	Kolmogorov-Smirnov Gamma GOF Test	
1090	5% K-S Critical Value	0.146	Data Not Gamma Distributed at 5% Significance Level	
1098	Data Not Gam	na Distribut	ed at 5% Significance Level	
1099				
1100		Gamma	Statistics	
1100				

	A B C D E	F	G H I J K	L							
1101	k hat (MLE)	94.85	k star (bias corrected MLE)	86.96							
1102	Theta hat (MLE)	0.00292	Theta star (bias corrected MLE)	0.00319							
1103	nu hat (MLE)	6829	nu star (bias corrected)	6261							
1104	MLE Mean (bias corrected)	0.277	MLE Sd (bias corrected)								
1105											
1106	Background St	atistics Ass	uming Gamma Distribution								
1107	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.329	90% Percentile	0.316							
1108	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.329	95% Percentile	0.328							
1109	95% WH Approx. Gamma UTL with 95% Coverage	0.343	99% Percentile	0.351							
1110	95% HW Approx. Gamma UTL with 95% Coverage	0.343									
1111	95% WH USL	0.366	95% HW USL	0.367							
1112											
1113		-	I GOF Test								
1114	Shapiro Wilk Test Statistic	0.935	Shapiro Wilk Lognormal GOF Test								
1115	5% Shapiro Wilk Critical Value	0.935	Data appear Lognormal at 5% Significance Level								
1116	Lilliefors Test Statistic	0.16	Lilliefors Lognormal GOF Test								
1117	5% Lilliefors Critical Value	0.145	Data Not Lognormal at 5% Significance Level								
1118	Data appear Appro	ximate Logr	normal at 5% Significance Level								
1119											
1120			ming Lognormal Distribution								
1121	95% UTL with 95% Coverage	0.344	90% Percentile (z)	0.315							
1122	95% UPL (t)	0.329	95% Percentile (z)	0.327							
1123	95% USL	0.369	99% Percentile (z)	0.351							
1124	Norroromotrio	Distribution	Free Deskarsund Clatistics								
1125			Free Background Statistics normal at 5% Significance Level								
1126		ximate Logi									
1127	Nonparametric Unn	or Limits fo	r Background Threshold Values								
1128	Order of Statiatia r	36	95% UTL with 95% Coverage	0.34							
1129	Approx, f used to compute achieved CC	1.895	Approximate Actual Confidence Coefficient achieved by UTL	0.842							
1130			Approximate Sample Size needed to achieve specified CC	59							
1131	95% Percentile Bootstrap UTL with 95% Coverage	0.34	95% BCA Bootstrap UTL with 95% Coverage	0.33							
1132	95% UPL	0.332	90% Percentile	0.33							
1133 1134	90% Chebyshev UPL	0.366	95% Percentile	0.33							
	95% Chebyshev UPL	0.407	99% Percentile	0.337							
1135 1136		0.34									
1130			<u> </u>								
1138	Note: The use of USL tends to yield a conservation	ve estimate	of BTV, especially when the sample size starts exceeding 20.								
1139	Therefore, one may use USL to estimate a BTV	only when th	ne data set represents a background data set free of outliers								
1140	and consists of observa	tions collect	ed from clean unimpacted locations.								
1141	The use of USL tends to provide a balan	ce between	false positives and false negatives provided the data								
1142	represents a background data set and wh	nen many or	site observations need to be compared with the BTV.								
1143											
	METHYLENE CHLORIDE (ug/L)										
1145											
1146		General	Statistics								
1147	Total Number of Observations	45	Number of Missing Observations	0							
	Number of Distinct Observations	1									
1148											
1148 1149	Number of Detects	0	Number of Non-Detects	45							

	A B C D E	F	G H I J K	1
1151	Minimum Detect	N/A	Minimum Non-Detect	1
1152	Maximum Detect	N/A	Maximum Non-Detect	1
1153	Variance Detected	N/A	Percent Non-Detects	100%
1154	Mean Detected	N/A	SD Detected	N/A
1155	Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A
1156				
1157	Warning: All observations are Non-Detects	s (NDs), the	refore all statistics and estimates should also be NDs!	
1158	Specifically, sample mean, UCLs, UPLs, and	d other statis	stics are also NDs lying below the largest detection limit!	
1159	The Project Team may decide to use alternative si	te specific v	values to estimate environmental parameters (e.g., EPC, BTV).	
1160				
1161	The data set for variable M	ETHYLENE	CHLORIDE (ug/L) was not processed!	
1162 1163				
1164	NITRATE-NITROGEN (mg/L)			
1165	General Statistics			
1100	Total Number of Observations	44	Number of Distinct Observations	36
1167	Minimum	4.9	First Quartile	19.8
1168	Second Largest	29	Median	22.5
1169	Maximum	31.7	Third Quartile	25.9
1170	Mean	21.1	SD	6.402
1171	Coefficient of Variation	0.303	Skewness	-1.006
1172	Mean of logged Data	2.982	SD of logged Data	0.416
1173		2.002		0.410
1174	Critical Values fr	or Backgrou	nd Threshold Values (BTVs)	
1175	Tolerance Factor K (For UTL)	2.091	d2max (for USL)	2.906
1176		2.001		2.000
1177		Normal (GOF Test	
1178	Shapiro Wilk Test Statistic	0.891	Shapiro Wilk GOF Test	
1179	5% Shapiro Wilk Critical Value	0.944	Data Not Normal at 5% Significance Level	
1180	Lilliefors Test Statistic	0.182	Lilliefors GOF Test	
1181	5% Lilliefors Critical Value	0.132	Data Not Normal at 5% Significance Level	
1182			% Significance Level	
1183				
1184	Background S	tatistics Ass	suming Normal Distribution	
1185	OE% LITL with OE% Coverage	34.48	90% Percentile (z)	29.3
1186	95% UPL (t)	31.98	95% Percentile (z)	31.63
1187		39.7	99% Percentile (z)	35.99
1188		00.7		00.00
1189		Gamma	GOF Test	
1190	A-D Test Statistic	3.014	Anderson-Darling Gamma GOF Test	
1191	5% A-D Critical Value	0.751	Data Not Gamma Distributed at 5% Significance Leve	
1192	K-S Test Statistic	0.24	Kolmogorov-Smirnov Gamma GOF Test	-
1193	5% K-S Critical Value	0.133	Data Not Gamma Distributed at 5% Significance Leve	
1194			ed at 5% Significance Level	-
1195				
1196		Gammo	Statistics	
1197	k hat (MLE)	7.602	k star (bias corrected MLE)	7.099
1198	Theta hat (MLE)	2.775	Theta star (bias corrected MLE)	2.972
1199	nu hat (MIE)	669	nu star (bias corrected MLE)	
1200	nu hat (MLE)	009	nu star (bias corrected)	624.7

1201	A B C D E MLE Mean (bias corrected)	F 21.1	G H I J K MLE Sd (bias corrected)	7.919
1201				
1202 1203	Background St	atistics Ass	uming Gamma Distribution	
1203	95% Wilson Hilferty (WH) Approx. Gamma UPL	35.86	90% Percentile	31.67
1204	95% Hawkins Wixley (HW) Approx. Gamma UPL	36.68	95% Percentile	35.58
1205	OF WILL A server Common LITL with OF Coverage	40.33	99% Percentile	43.73
1200	95% HW Approx. Gamma UTL with 95% Coverage	41.61		
1207	95% WH USL	50.81	95% HW USL	53.48
1208				
1209		Lognorma	I GOF Test	
1210	Shapiro Wilk Test Statistic	0.781	Shapiro Wilk Lognormal GOF Test	
	5% Shapiro Wilk Critical Value	0.944	Data Not Lognormal at 5% Significance Level	
1212	Lilliofore Tost Statistic	0.263	Lilliefors Lognormal GOF Test	
1213	5% Lilliofore Critical Value	0.132	Data Not Lognormal at 5% Significance Level	
1214	Data Not I	ognormal at	5% Significance Level	
1215				
1216	Pookground Sto	tistics assu	ming Lognormal Distribution	
1217	95% LITL with 95% Coverage	47.03	90% Percentile (z)	33.6
1218		39.98	95% Percentile (z)	39.07
1219		66	99% Percentile (z)	51.86
1220				
1221	Nonparametric	Distribution	Free Background Statistics	
1222	· · · · · · · · · · · · · · · · · · ·		ernible Distribution (0.05)	
1223				
1224	Nonparametric I Inn	er l imits fo	r Background Threshold Values	
1225	Order of Statistic, r	44	95% UTL with 95% Coverage	31.7
1226	Approx, f used to compute achieved CC	2.316	Approximate Actual Confidence Coefficient achieved by UTL	0.895
1227		2.510	Approximate Actual Commence Coemicient denieved by CT2 Approximate Sample Size needed to achieve specified CC	59
1228	95% Percentile Bootstrap UTL with 95% Coverage	31.3	95% BCA Bootstrap UTL with 95% Coverage	31.12
1229	05% []D]	28.7	90% Percentile	26.7
1230	90% Chebyshev UPL	40.52	95% Percentile	27.7
1231		49.32	99% Percentile	30.54
1232		31.7		50.54
1233		51.7		
1234	Note: The use of USL tends to viold a concentration	vo estimato	of BTV, especially when the sample size starts exceeding 20.	
1235	Therefore, one may use LISL to estimate a DTV/		he data set represents a background data set free of outliers	
1236	end consists of chooses		ed from clean unimpacted locations.	
1237	The use of USL tends to provide a balan		false positives and false negatives provided the data	
1238	represents a background data act and wh		isite observations need to be compared with the BTV.	
1239			site observations need to be compared with the DTV.	
1240	pH-FIELD (SU)			
1242	General Statistics			
1243	Total Number of Observations	43	Number of Distinct Observations	37
1244	Minimum	3.91	First Quartile	4.55
1245	Cocond Lorgost	6.38	Median	4.55
1246	Movimum	6.55	Third Quartile	5.135
1247	Maan	4.927	SD	0.567
1248	Coofficient of Veriation	0.115		
1249	Mean of lawsed Date	1.589	Skewness SD of logged Data	1.169 0.11
1250	wean or logged Data	1.009	SD of logged Data	0.11

Lease Normal GOF Test 1255 Shapiro Wilk Test Statistic 0.88 Shapiro Wilk GOF Test 1257 Sin Shapiro Wilk Critical Value 0.943 Data Not Normal at 5% Significance Level 1289 Lilliefors Test Statistic 0.193 Lilliefors GOF Test 1289 Significance Level Data Not Normal at 5% Significance Level 1266 1260 Data Not Normal at 5% Significance Level 1267 90% Percentile (2) 5 1263 95% UTL with 95% Coverage 6.115 90% Percentile (2) 5 1264 95% USL 6.568 99% Percentile (2) 5 1265 Significance Level 1267 Camma GOF Test 1268 1266 Significance Level 1269 A-D Test Statistic 149 Anderson-Darling Gamma GOF Test 1268 A-D Test Statistic 149 Anderson-Darling Gamma GOF Test 1271 1270 K-S Test Statistic 149 Not Gamma Darbuted at 5% Significance Level 1272 1271 Data Not Gamma Darbuted at 5% Significance Level 1273 1274		A B C D E	F	G H I J K	L
Link Telerance Factor K (For UTL) 2.097 d2max (for USL) 2. 1255 Shapiro Wilk GoF Test 1256 1257 1258 1257 1258 1257 1258 1257 1258 1257 1258 1257 5% Shapiro Wilk Grit Set Statistic 0.983 Data Not Normal at 5% Significance Level 1258 1258 1258 1258 1258 1258 1258 1258 1258 1258 1258 1258 1258 1258 1258 1258 1258 1259 1260 1270 1270 1270 1270 1270 1271 1274 1270 1271 1271 1271 1271 1271 1271 1271	1251				
Internal GOF Test Normal GOF Test 1255 Shapiro Wilk Cell Statistic 0.88 Shapiro Wilk GOF Test 1257 5% Shapiro Wilk Cell Value 0.943 Data Not Normal at 5% Significance Level 1258 Lilliefors Critical Value 0.943 Data Not Normal at 5% Significance Level 1259 5% Lilliefors Critical Value 0.134 Data Not Normal at 5% Significance Level 1260 Data Not Normal at 5% Significance Level 5% 5% 1261 Background Statistice Assuming Normal Distribution 5% 5% 1262 Background Statistice Assuming Normal Distribution 5% 5% 1263 95% USL 6.568 95% Percentile (2) 5 1266 Sama GOF Test 1849 Anderson-Darling Gamma GOF Test 1261 1266 S% A-D Critical Value 0.747 Data Not Gamma Distributed at 5% Significance Level 1271 1270 K-S Test Statistic 1.849 Anderson-Darling Gamma GOF Test 1272 1271 Dist Not Gamma Distributed at 5% Significance Level 1272 Data Not Gamma Distributed at 5% Significance Level	1252		-		0.007
Normal GOF Test 1236 Shapiro Wilk Test Statutic 0.84 Shapiro Wilk Cortical Value 0.843 Data Not Normal at 5% Significance Level 1237 D% Shapiro Wilk Test Statutic 0.193 Lillefors GOF Test 1238 Lillefors Test Statutic 0.193 Lillefors GOF Test 1239 Data Not Normal at 5% Significance Level Data Not Normal at 5% Significance Level 1260 Data Not Normal at 5% Significance Level 1263 1263 Background Statistics Assuming Normal Distribution 5 1264 95% UTL with 55% Coverage 6.115 90% Percentile (2) 5 1265 95% USL 6.568 99% Percentile (2) 5 1266 95% A-D Erst Statutic 134 Anderson-Darling Gamma GOF Test 1272 1276 A-D Test Statutic 134 Data Not Gamma Distributed at 5% Significance Level 1272 1272 Data Not Gamma Distributed at 5% Significance Level 1272 1272 128 1272 1272 Data Not Gamma Distributed at 5% Significance Level 1272 1274 1272 1274 1	1253	Tolerance Factor K (For UTL)	2.097	d2max (for USL)	2.897
Li230 Shapiro Wik Test Statistic 0.88 Shapiro Wik GOF Test 1257 5% Shapiro Wik Critical Value 0.943 Data Not Normal at 5% Significance Level 1258 Lilleifors Critical Value 0.193 Data Not Normal at 5% Significance Level 1259 5% Lilleifors Critical Value 0.134 Data Not Normal at 5% Significance Level 1260 Data Not Normal at 5% Significance Level 1260 1261 Background Statistics Assuming Normal Distribution 90% Percentile (z) 5 1264 95% UPL (r) 5.891 95% Percentile (z) 5 1265 95% USL (r) 5.891 95% Percentile (z) 5 1266 95% USL (r) 7 Data Not Gamma Distributed at 5% Significance Level 1 1268 -A-D Test Statistic 1.849 Anderson-Darling Gamma GOF Test 1 1270 K-S Critical Value 0.714 Data Not Gamma Distributed at 5% Significance Level 1 1271 5% K-S Critical Value 0.134 Data Not Gamma Distributed at 5% Significance Level 1 1272 Data Not Gamma Distributed at 5% Significance	1254		Normal (
1250 5% Shapiro Wilk Critical Value 0.943 Data Not Normal at 5% Significance Level 1258 Lilliefors Test Statistic 0.193 Data Not Normal at 5% Significance Level 1269 5% Lilliefors Critical Value 0.134 Data Not Normal at 5% Significance Level 1260 Data Not Normal at 5% Significance Level Data Not Normal at 5% Significance Level 1261 1261 Data Not Normal at 5% Significance Level 1263 95% UTL with 95% Coverage 6.115 90% Percentile (z) 5 1263 95% UTL with 95% Coverage 6.15 90% Percentile (z) 6 1264 95% USL 6.568 99% Percentile (z) 6 1265 95% AD Critical Value 0.747 Data Not Gamma Distributed at 5% Significance Level 1270 1270 K-S Test Statistic 0.134 Data Not Gamma Distributed at 5% Significance Level 1272 1272 Data Not Gamma Distributed at 5% Significance Level 1272 1273 1273 S% K-S Critical Value 0.134 Data Not Gamma Distributed at 5% Significance Level 1272 1274 Data Not Gamma Distributed at 5% Signi		Shapira Wilk Tast Statistic			
1227 Lilliefors Test Statistic 0.193 Lilliefors GOF Test 1256 5% Lilliefors Critical Value 0.134 Data Not Normal at 5%. Significance Level 1260 Data Not Normal at 5%. Significance Level 1261 1262 Background Statistics Assuming Normal Distribution 90% Percentile (z) 5 1263 95% UTL with 95% Coverage 6.115 90% Percentile (z) 5 1264 95% VSL (6.568 99% Percentile (z) 5 1265 95% USL (6.568 99% Percentile (z) 5 1266		•		•	
1288 5% Lilletors Critical Value 0.134 Data Not Normal at 5% Significance Level 1280 Data Not Normal at 5% Significance Level 1281 1281 Background Statistics Assuming Normal Distribution 5 1283 95% UTL with 95% Coverage 6.115 90% Percentile (z) 5 1284 95% USL 6.588 99% Percentile (z) 5 1285 95% USL 6.568 99% Percentile (z) 5 1286 .4D Test Statistic 1.849 Anderson-Darling Gamma GOF Test 1 1286 .4D Test Statistic 0.747 Data Not Gamma Distributed at 5% Significance Level 1 1270 K-S Test Statistic 0.191 Kolmoporov-Smirnov Gamma GOF Test 1 1271 5% K-S Critical Value 0.134 Data Not Gamma Distributed at 5% Significance Level 1 1272 Data Not Gamma Distributed at 5% Significance Level 1 1 1 1272 Data Not Gamma Distributed at 5% Significance Level 1 1 1 1273 K hat (MLE) 82.89 K star (bias corrected)					
Less Data Not Normal at \$% Significance Level 1260 Background Stalistics Assuming Normal Distribution 1263 95% UTL with 95% Coverage 6.115 90% Percentile (2) 5 1264 95% USL 6.568 99% Percentile (2) 6 1265 95% USL 6.568 99% Percentile (2) 6 1266					
1280 Background Statistics Assuming Normal Distribution 1283 95% UTL with 96% Coverage 6.115 90% Percentile (z) 5 1284 95% USL 6.568 99% Percentile (z) 6 1285 95% USL 6.568 99% Percentile (z) 6 1286 95% USL 6.568 99% Percentile (z) 6 1286 A-D Test Statistic 1.849 Anderson-Darling Gamma GOF Test 1 1289 5% A-D Critical Value 0.747 Data Not Gamma Distributed at 5% Significance Level 1 1270 5% K-S Critical Value 0.134 Data Not Gamma Distributed at 5% Significance Level 1 1271 5% K-S Critical Value 0.134 Data Not Gamma Distributed at 5% Significance Level 1 1272 Data Not Gamma Distributed at 5% Significance Level 1 77 1273 K hat (MLE) 0.594 Theta stat (bias corrected MLE) 7 1276 K hat (MLE) 0.497 MLE Sa (bias corrected MLE) 7 1278 K hat (MLE) 0.5895 90% Percentile 5 <td></td> <td></td> <td></td> <td></td> <td></td>					
1262 Background Statistics Assuming Normal Distribution 1263 95% UTL with 95% Coverage 6.15 90% Percentile (2) 5 1264 95% UTL with 95% Coverage 6.158 90% Percentile (2) 5 1265 95% USL 6.568 99% Percentile (2) 6 1266 95% USL 6.568 99% Percentile (2) 6 1268					
1222 95% UTL with 95% Coverage 6.115 90% Percentile (z) 5 1284 95% UPL (t) 5.891 95% Percentile (z) 5 1286 95% USL 6.568 99% Percentile (z) 6 1286 95% USL 6.568 99% Percentile (z) 6 1287 Camma GOF Test 1.849 Anderson-Dariing Gamma GOF Test 1.849 1288 A-D Test Statistic 1.849 Anderson-Dariing Gamma GOF Test 1.849 1270 K-S Test Statistic 0.134 Data Not Gamma Distributed at 5% Significance Level 1.271 1271 5% K-S Critical Value 0.134 Data Not Gamma Distributed at 5% Significance Level 1.272 1272 Data Not Gamma Statistics 1.271 1.276 K hat (MLE) 0.0594 Theta star (bias corrected MLE) 7 1276 K hat (MLE) 7129 nu star (bias corrected MLE) 10.272 0.0594 1.278 0.01277 0.0141 0.0594 1.0161 0.01277 0.0141 0.0141 0.01277 0.0141 0.0141 <		Background St	tatistics Ass	uming Normal Distribution	
1283 95% UPL (t) 5.891 95% Percentile (z) 5. 1286 95% USL 6.568 99% Percentile (z) 6 1286				-	5.653
Izea 95% USL 6.568 99% Percentile (z) 6 1266		Ũ			5.859
Less Camma GOF Test 1266 Samma GOF Test 1268 A-D Test Statistic 0.747 Data Not Gamma Distributed at 5% Significance Level 1270 K-S Test Statistic 0.191 Kolmogorov-Smirnov Gamma OCF Test 1271 5% K-S Critical Value 0.134 Data Not Gamma Distributed at 5% Significance Level 1272 Data Not Gamma Distributed at 5% Significance Level 1273 Significance Level 1273 Data Not Gamma Distributed at 5% Significance Level 1274 1275 1275 K hat (MLE) 82.89 K star (bias corrected MLE) 172 1276 Theta hat (MLE) 0.0594 Theta star (bias corrected MLE) 10 1277 nu hat (MLE) 1927 nu star (bias corrected) 0 1278 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 0 1279 mu hat (MLE) 7129 nu star (bias corrected) 0 1281 95% Wilson Hilferty (WH) Approx. Gamma UPL 5.895 90% Percentile 5 1282 95% WH Approx. Gamma UTL with 95% Coverage 6.14					6.245
1267 Gamma GOF Test 1268 A-D Test Statistic 1.849 Anderson-Darling Gamma GOF Test 1269 5% A-D Critical Value 0.747 Data Not Gamma Distributed at 5% Significance Level 1270 K-S Test Statistic 0.191 Koimogorov-Smirnov Gamma GOF Test 1271 5% K-S Critical Value 0.134 Data Not Gamma Distributed at 5% Significance Level 1272 Data Not Gamma Distributed at 5% Significance Level 1275 Statistics 1275 Theta Nt Gamma ULL 82.89 k star (bias corrected MLE) 0.131 1276 MLE Mean (bias corrected) 0.994 Otheras at (bias corrected) 0.633 1277 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 0.0594 1278 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 0.0594 1278 MLE Mean (bias corrected) 5.895 90% Percentile 5.595 1283 95% WH Approx. Gamma UPL 5.895 90% Percentile 5.1282 1284 95% WH Approx. Gamma UTL with 95% Coverage 6.147 1.447		3378 002	0.000		0.243
L201 A.D.Test Statistic 1.849 Anderson-Darling Gamma GOF Test 1268 5% A-D. Critical Value 0.747 Data Not Gamma Distributed at 5% Significance Level 1270 K-S.Test Statistic 0.191 Kolmogorov-Smirnov Gamma GOF Test 1271 5% K-S. Critical Value 0.134 Data Not Gamma Distributed at 5% Significance Level 1273 Data Not Gamma Distributed at 5% Significance Level 0.134 Data Not Gamma Distributed at 5% Significance Level 1273 Data Not Gamma Distributed at 5% Significance Level 0.134 Data Not Gamma Distributed at 5% Significance Level 1273 Mathema Not Kamma Distributed at 5% Significance Level 0.134 Data Not Gamma Distributed at 5% Significance Level 1274 K hat (MLE) 82.89 K star (bias corrected) 0.131 1275 K hat (MLE) 0.0594 Theta star (bias corrected) 0.131 1276 MLE Mean (bias corrected) 1.427 MLE Sd (bias corrected) 0.131 1278 MLE Mean (bias corrected) 5.895 90% Percentile 5.128 1281 95% Witk prox. Gamma UPL 5.895 90% Percentile			Gamma (SOF Test	
1200 5% A-D Critical Value 0.747 Data Not Gamma Distributed at 5% Significance Level 1270 K-S Test Statistic 0.191 Kolmogorov-Smirnov Gamma GOF Test 1271 5% K-S Critical Value 0.134 Data Not Gamma Distributed at 5% Significance Level 1272 Data Not Gamma Distributed at 5% Significance Level 0.134 Data Not Gamma Distributed at 5% Significance Level 1273 Data Not Gamma Statistics 642.89 k star (bias corrected MLE) 77 1276 K hat (MLE) 0.554 Theta star (bias corrected MLE) 663 1278 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 663 1279 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 60 1279 95% WH Approx. Gamma UPL 5.895 90% Percentile 5 1281 95% WH Approx. Gamma UPL 5.895 90% Percentile 5 1283 95% WH Approx. Gamma UPL 5.895 90% Percentile 5 1284 95% WH Approx. Gamma UTL 54.96 95% HW USL 6 1284 95% WH		A-D Test Statistic			
Izes GOF Test 1270 K-S Test Statistic 0.191 Kolmogorov-Smirnov Gamma GOF Test 1271 5% K-S Critical Value 0.134 Data Not Gamma Distributed at 5% Significance Level 1272 Data Not Gamma Distributed at 5% Significance Level 1273 1274 Gamma Statistics 0.191 1275 K hat (MLE) 82.89 K star (bias corrected MLE) 0.1 1276 Theta hat (MLE) 0.0594 Theta star (bias corrected MLE) 0.1 1276 Theta hat (MLE) 7.129 nu star (bias corrected MLE) 0.1 1278 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 0.1 1279 1281 95% Wilson Hilferty (WH) Approx. Gamma UPL 5.895 90% Percentile 5. 1281 95% Wilson Hilferty (WH) Approx. Gamma UPL 5.896 95% Percentile 5. 1282 95% Hawkins Wixley (HW) Approx. Gamma UPL 5.896 95% HW USL 6. 1284 95% HW Approx. Gamma UTL with 95% Coverage 6.147 1. 1. 1285 Shapiro Wil					el
1271 5% K-S Critical Value 0.134 Data Not Gamma Distributed at 5% Significance Level 1272 Data Not Gamma Distributed at 5% Significance Level 1273 1274 Gamma Statistics 1275 K hat (MLE) 82.89 K star (bias corrected MLE) 0.7 1276 Theta hat (MLE) 0.0594 Theta star (bias corrected MLE) 0.1 1277 nu hat (MLE) 7129 nu star (bias corrected) 663 1278 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 0.0 1279 Background Statistics Assuming Gamma Distribution 5.895 90% Percentile 5. 1281 95% Wilson Hilferty (WH) Approx. Gamma UPL 5.895 90% Percentile 5. 1283 95% WH Approx. Gamma UPL 5.895 90% Percentile 5. 1284 95% HW Approx. Gamma UL with 95% Coverage 6.147 5. 5. 1284 95% HW Approx. Gamma UL with 95% Coverage 6.147 5. 5. 1285 95% VH USL 6.664 95% HW USL 6. 1284			-		01
Background Statistics Significance Level 1273 Gamma Statistics 1274 Gamma Statistics 1275 k hat (MLE) 82.89 k star (bias corrected MLE) 77 1276 Theta hat (MLE) 0.0594 Theta star (bias corrected MLE) 0.1 1277 nu hat (MLE) 0.129 nu star (bias corrected) 663 1278 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 0 1279 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 0 1279 Background Statistics Assuming Gamma Distribution 5 90% Percentile 5 1281 95% Wilson Hilferty (WH) Approx. Gamma UPL 5.895 90% Percentile 5 1283 95% WH Approx. Gamma UTL with 95% Coverage 6.147 5 6 1284 95% HW Approx. Gamma UTL with 95% Coverage 6.147 6 6 1284 Shapiro Wilk Test Statistic 0.907 Shapiro Wilk Lognormal at S% Significance Level 6 1285 95% Shapiro Wilk Critical Value 0.186 <t< td=""><td></td><td></td><td></td><td></td><td>ما</td></t<>					ما
Background Statistics Statistics 1273 (amma Statistics 1274 Theta hat (MLE) 82.89 k star (bias corrected MLE) 0.0 1276 Theta hat (MLE) 0.0594 Theta star (bias corrected MLE) 0.1 1277 nu hat (MLE) 7129 nu star (bias corrected) 663 1278 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 0.1 1279 Theta star (bias corrected) 4.927 MLE Sd (bias corrected) 0.1 1279 Theta star (bias corrected) 4.927 MLE Sd (bias corrected) 0.1 1279 Theta star (bias corrected) 4.927 MLE Sd (bias corrected) 0.0 1281 95% Wilson Hilferby (WH) Approx. Gamma UPL 5.895 90% Percentile 5 1283 95% WH Approx. Gamma UTL with 95% Coverage 6.143 99% Percentile 6 1284 95% HW Approx. Gamma UTL with 95% Coverage 6.147 1 1 1285 95% WH USL 6.664 95% HW USL 6 1288 Shapiro Wilk Test St					CI
1274 Gamma Statistics 1275 k hat (MLE) 82.89 k star (bias corrected MLE) 77 1276 Theta hat (MLE) 0.0594 Theta star (bias corrected MLE) 0.1 1277 nu hat (MLE) 7129 nu star (bias corrected MLE) 0.1 1277 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 663 1278 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 0.0 1279 Theta hat (MLE) 5.895 90% Percentile 5. 1281 95% Wilson Hilferty (WH) Approx. Gamma UPL 5.895 90% Percentile 5. 1282 95% Hawkins Wixley (HW) Approx. Gamma UPL 5.896 95% Percentile 5. 1283 95% WH Approx. Gamma UTL with 95% Coverage 6.143 99% Percentile 6. 1284 95% HW Approx. Gamma UTL with 95% Coverage 6.147 1. 6. 1285 95% WH USL 6.664 95% HW USL 6. 1286 0.907 Shapiro Wilk Lognormal GOF Test 1. 1288					
12/4 k hat (MLE) 82.89 k star (bias corrected MLE) 77 1275 Theta hat (MLE) 0.0594 Theta star (bias corrected MLE) 0.0 1277 nu hat (MLE) 7129 nu star (bias corrected) 663 1278 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 0.0 1279 Background Statistics Assuming Gamma Distribution 5 1280 Background Statistics Assuming Gamma Distribution 5 1281 95% Wilson Hilferty (WH) Approx. Gamma UPL 5.895 90% Percentile 5 1283 95% WH Approx. Gamma UTL 5.896 95% Percentile 6 1284 95% WH Approx. Gamma UTL with 95% Coverage 6.143 99% Percentile 6 1284 95% WH Approx. Gamma UTL with 95% Coverage 6.147 1285 95% WH USL 6.664 95% HW USL 6 1286 0.907 Shapiro Wilk Lognormal GOF Test 1289 Shapiro Wilk Critical Value 0.943 Data Not Lognormal at 5% Significance Level </td <td></td> <td></td> <td>Gamma</td> <td>Statistics</td> <td></td>			Gamma	Statistics	
1275 Theta hat (MLE) 0.0594 Theta star (bias corrected MLE) 0.1 1276 nu hat (MLE) 7129 nu star (bias corrected) 663 1278 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 0.1 1279 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 0.1 1279 Background Statistics Assuming Gamma Distribution 5 1280 Background Statistics Assuming Gamma Distribution 5 5 90% Percentile 5 1281 95% Wilson Hilferty (WH) Approx. Gamma UPL 5.895 90% Percentile 5 5 1283 95% WH Approx. Gamma UTL with 95% Coverage 6.143 99% Percentile 6 1284 95% HW Approx. Gamma UTL with 95% Coverage 6.147 5 6 1286 95% HW USL 6 6 6 6 1 6 1288 Shapiro Wilk Test Statistic 0.907 Shapiro Wilk Lognormal GOF Test 1 1 1 1 1 1 <t< td=""><td></td><td>k bat (MLE)</td><td></td><td></td><td>77.13</td></t<>		k bat (MLE)			77.13
1276 nu hat (MLE) 7129 nu star (bias corrected) 663 1278 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 0 1279 0 0 1278 Background Statistics Assuming Gamma Distribution 0 0 1280 Background Statistics Assuming Gamma Distribution 5 90% Percentile 5 1281 95% Wilson Hilferty (WH) Approx. Gamma UPL 5.895 90% Percentile 5 1283 95% WH Approx. Gamma UTL with 95% Coverage 6.143 99% Percentile 6 1284 95% HW Approx. Gamma UTL with 95% Coverage 6.147 6 1285 95% WH USL 6.664 95% HW USL 6 1286 1287 1288 Shapiro Wilk Test Statistic 0.907 Shapiro Wilk Lognormal GOF Test 1289 5% Shapiro Wilk Critical Value 0.943 Data Not Lognormal at 5% Significance Level 1290 Lilliefors Test Statistic 0.186 Lilliliefors Lognormal at 5% Significance Level					0.0639
IZ77 MLE Mean (bias corrected) 4.927 MLE Sd (bias corrected) 0 1278 MLE Sd (bias corrected) 4.927 MLE Sd (bias corrected) 0 1279 Interval Statistics Assuming Gamma Distribution 5 90% Percentile 5 1280 Background Statistics Assuming Gamma Distribution 5 90% Percentile 5 1281 95% Wilson Hilferty (WH) Approx. Gamma UPL 5.896 95% Percentile 5 1283 95% WH Approx. Gamma UTL with 95% Coverage 6.143 99% Percentile 6 1284 95% HW Approx. Gamma UTL with 95% Coverage 6.147 1 1 1 1285 95% WH USL 6.664 95% HW USL 6 1286 1288 Shapiro Wilk Test Statistic 0.907 Shapiro Wilk Lognormal GOF Test 1288 Shapiro Wilk Critical Value 0.943 Data Not Lognormal GOF Test 1 1290 Lilliefors Test Statistic 0.186 Lilliefors Lognormal GOF Test 1 1291 5% Lilliefors Critical Value 0.134 Data Not Lognormal at 5% Significance Level					6633
Izra Izra 1279 Background Statistics Assuming Gamma Distribution 1280 95% Wilson Hilferty (WH) Approx. Gamma UPL 5.895 90% Percentile 5 1281 95% Hawkins Wixley (HW) Approx. Gamma UPL 5.896 95% Percentile 5 1282 95% HApprox. Gamma UTL with 95% Coverage 6.143 99% Percentile 6 1284 95% HW Approx. Gamma UTL with 95% Coverage 6.664 95% HW USL 6 1285 95% WH USL 6.664 95% HW USL 6 1286 95% Shapiro Wilk Test Statistic 0.907 Shapiro Wilk Lognormal GOF Test 1288 Shapiro Wilk Test Statistic 0.907 Shapiro Wilk Lognormal at 5% Significance Level 1289 5% Shapiro Wilk Critical Value 0.943 Data Not Lognormal at 5% Significance Level 1291 5% Lilliefors Test Statistic 0.134 Data Not Lognormal at 5% Significance Level 1292 Data Not Lognormal at 5% Significance Level 1293 1294 1290 % Percentile (z) 5 1294 Background Statistics assuming Lognormal Distribution 1295 95% UPL (t)		· · ·			0.561
1280 Background Statistics Assuming Gamma Distribution 1281 95% Wilson Hilferty (WH) Approx. Gamma UPL 5.895 90% Percentile 5. 1282 95% Hawkins Wixley (HW) Approx. Gamma UPL 5.896 95% Percentile 5. 1283 95% WH Approx. Gamma UTL with 95% Coverage 6.143 99% Percentile 6. 1284 95% HW Approx. Gamma UTL with 95% Coverage 6.147 6. 1286 95% HW USL 6. 1285 95% WH USL 6.664 95% HW USL 6. 1286 95% Shapiro Wilk Test Statistic 0.907 Shapiro Wilk Lognormal GOF Test 1289 1289 5% Shapiro Wilk Critical Value 0.943 Data Not Lognormal at 5% Significance Level 1290 1211 1286 0.186 Lilliefors Lognormal GOF Test 1291 1280 1281 0.134 Data Not Lognormal at 5% Significance Level 1292 1293 1294 Data Not Lognormal at 5% Significance Level 1293 1294 95% UPL (t) 5.9 95% Percentile (z) 5.1 1296 95% UTL with 95% Coverage <t< td=""><td></td><td></td><td></td><td></td><td></td></t<>					
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1282 95% Hawkins Wixley (HW) Approx. Gamma UPL 5.896 95% Percentile 5. 1283 95% WH Approx. Gamma UTL with 95% Coverage 6.143 99% Percentile 6. 1284 95% HW Approx. Gamma UTL with 95% Coverage 6.147 6. 1285 95% WH USL 6.664 95% HW USL 6. 1286 95% HW USL 6.664 95% HW USL 6. 1287 Lognormal GOF Test 5% 5% 6. 5% 1288 Shapiro Wilk Test Statistic 0.907 Shapiro Wilk Lognormal GOF Test 5% 1289 5% Shapiro Wilk Critical Value 0.943 Data Not Lognormal at 5% Significance Level 5% 1290 Lilliefors Test Statistic 0.186 Lilliefors Lognormal at 5% Significance Level 5% 1291 5% Lilliefors Critical Value 0.134 Data Not Lognormal at 5% Significance Level 5% 1293 Background Statistics assuming Lognormal Distribution 1293 5% 5% 1294 Background Statistics assuming Lognormal Distribution 5% 5%				-	5.658
1283 95% WH Approx. Gamma UTL with 95% Coverage 6.143 99% Percentile 6. 1284 95% HW Approx. Gamma UTL with 95% Coverage 6.147 1285 95% HW USL 6.664 95% HW USL 6. 1285 95% WH USL 6.664 95% HW USL 6. 6. 1286 Lognormal GOF Test 1287 Lognormal GOF Test 1288 Shapiro Wilk Test Statistic 0.907 Shapiro Wilk Lognormal GOF Test 1289 1289 5% Shapiro Wilk Critical Value 0.943 Data Not Lognormal GOF Test 1290 12100 12100 12100 12100 12100 0.134 Data Not Lognormal GOF Test 1291 1291 5% Lilliefors Critical Value 0.134 Data Not Lognormal at 5% Significance Level 1292 1293 1294 1294 Background Statistics assuming Lognormal Distribution 1295 95% UTL with 95% Coverage 6.161 90% Percentile (z) 5. 1294 Background Statistics assuming Lognormal Distribution 1295 95% UTL with 95% Co				95% Percentile	5.884
1284 95% HW Approx. Gamma UTL with 95% Coverage 6.147 1285 95% HW USL 6.664 95% HW USL 6. 1286 1287 Lognormal GOF Test 5 1288 Shapiro Wilk Test Statistic 0.907 Shapiro Wilk Lognormal GOF Test 1289 1289 5% Shapiro Wilk Critical Value 0.943 Data Not Lognormal GOF Test 1290 1290 Lilliefors Test Statistic 0.186 Lilliefors Lognormal GOF Test 1291 1291 5% Lilliefors Critical Value 0.134 Data Not Lognormal at 5% Significance Level 1292 1292 Data Not Lognormal at 5% Significance Level 1293 1294 Significance Level 1295 1294 Background Statistics assuming Lognormal Distribution 1295 95% UTL with 95% Coverage 6.161 90% Percentile (z) 5. 1295 95% UPL (t) 5.9 95% Percentile (z) 5. 5. 1296 00% Percentile (z) 5.9 5. 5. 5.		95% WH Approx. Gamma UTL with 95% Coverage	6.143	99% Percentile	6.325
1285 95% WH USL 6.664 95% HW USL 6. 1286 1287 Lognormal GOF Test 1288 1288 Shapiro Wilk Test Statistic 0.907 Shapiro Wilk Lognormal GOF Test 1289 5% Shapiro Wilk Critical Value 0.943 Data Not Lognormal GOF Test 1290 Lilliefors Test Statistic 0.186 Lilliefors Lognormal GOF Test 1291 5% Lilliefors Critical Value 0.134 Data Not Lognormal at 5% Significance Level 1292 Data Not Lognormal at 5% Significance Level 1292 Data Not Lognormal at 5% Significance Level 1293 1293 1294 Background Statistics assuming Lognormal Distribution 1295 95% UTL with 95% Coverage 6.161 90% Percentile (z) 5. 1295 95% UTL with 95% Coverage 6.161 90% Percentile (z) 5. 5. 1296 05% UTL with 95% Coverage 6.161 90% Percentile (z) 5. 5.		95% HW Approx. Gamma UTL with 95% Coverage	6.147		
1286 Lognormal GOF Test 1287 Shapiro Wilk Test Statistic 0.907 Shapiro Wilk Lognormal GOF Test 1288 Shapiro Wilk Critical Value 0.943 Data Not Lognormal at 5% Significance Level 1289 5% Shapiro Wilk Critical Value 0.943 Data Not Lognormal at 5% Significance Level 1290 Lilliefors Test Statistic 0.186 Lilliefors Lognormal GOF Test 1291 5% Lilliefors Critical Value 0.134 Data Not Lognormal at 5% Significance Level 1292 Data Not Lognormal at 5% Significance Level 1292 1293 Image: Significance Level 1293 1294 Background Statistics assuming Lognormal Distribution 90% Percentile (z) 5. 1295 95% UTL with 95% Coverage 6.161 90% Percentile (z) 5. 1296 05% UPL (t) 5.9 95% Percentile (z) 5.		95% WH USL	6.664	95% HW USL	6.679
1287 Lognormal GOF Test 1288 Shapiro Wilk Test Statistic 0.907 Shapiro Wilk Lognormal GOF Test 1289 5% Shapiro Wilk Critical Value 0.943 Data Not Lognormal at 5% Significance Level 1290 Lilliefors Test Statistic 0.186 Lilliefors Lognormal GOF Test 1291 5% Lilliefors Critical Value 0.134 Data Not Lognormal at 5% Significance Level 1292 Data Not Lognormal at 5% Significance Level 1292 1293 Data Not Lognormal at 5% Significance Level 1293 1294 Background Statistics assums Lognormal Distribution 90% Percentile (z) 5 1295 95% UTL with 95% Coverage 6.161 90% Percentile (z) 5 1296 95% UPL (t) 5.9 95% Percentile (z) 5					
1288 Shapiro Wilk Test Statistic 0.907 Shapiro Wilk Lognormal GOF Test 1289 5% Shapiro Wilk Critical Value 0.943 Data Not Lognormal at 5% Significance Level 1290 Lilliefors Test Statistic 0.186 Lilliefors Lognormal GOF Test 1291 5% Lilliefors Critical Value 0.134 Data Not Lognormal at 5% Significance Level 1292 Data Not Lognormal at 5% Significance Level 0.134 Data Not Lognormal at 5% Significance Level 1293 Image: Statistic Statistic Statistic Statistics assuming Lognormal Distribution 90% Percentile (z) 5. 1294 Background Statistics assuming Lognormal Distribution 90% Percentile (z) 5. 1295 95% UTL with 95% Coverage 6.161 90% Percentile (z) 5. 1296 95% UPL (t) 5.9 95% Percentile (z) 5.			Lognormal	GOF Test	
1289 5% Shapiro Wilk Critical Value 0.943 Data Not Lognormal at 5% Significance Level 1290 Lilliefors Test Statistic 0.186 Lilliefors Lognormal GOF Test 1291 5% Lilliefors Critical Value 0.134 Data Not Lognormal at 5% Significance Level 1292 Data Not Lognormal at 5% Significance Level 0.134 Data Not Lognormal at 5% Significance Level 1293 1293 Background Statistics assuming Lognormal Distribution 90% Percentile (z) 5. 1295 95% UTL with 95% Coverage 6.161 90% Percentile (z) 5. 1296 95% UPL (t) 5.9 95% Percentile (z) 5.		Shapiro Wilk Test Statistic	0.907	Shapiro Wilk Lognormal GOF Test	
1290 Lilliefors Test Statistic 0.186 Lilliefors Lognormal GOF Test 1291 5% Lilliefors Critical Value 0.134 Data Not Lognormal at 5% Significance Level 1292 Data Not Lognormal at 5% Significance Level 1293 Image: Significance Level 1294 Background Statistics assuming Lognormal Distribution 1295 95% UTL with 95% Coverage 6.161 90% Percentile (z) 5. 1296 95% UPL (t) 5.9 95% Percentile (z) 5.		5% Shapiro Wilk Critical Value	0.943	Data Not Lognormal at 5% Significance Level	
12915% Lilliefors Critical Value0.134Data Not Lognormal at 5% Significance Level1292Data Not Lognormal at 5% Significance Level12931294Background Statistics assuming Lognormal Distribution129595% UTL with 95% Coverage6.16190% Percentile (z)5.9129695% UPL (t)5.995% UPL (t)5.995% Percentile (z)5.995% UPL (t)5.9		Lilliefors Test Statistic	0.186	Lilliefors Lognormal GOF Test	
1292 Data Not Lognormal at 5% Significance Level 1293 1294 1295 95% UTL with 95% Coverage 6.161 1296 95% UPL (t) 5.9 1296 95% UPL (t) 5.9 00% Percentile (z) 5.9 00% Percentile (z) 5.9		5% Lilliefors Critical Value	0.134	Data Not Lognormal at 5% Significance Level	
1293 Background Statistics assuming Lognormal Distribution 1294 95% UTL with 95% Coverage 6.161 90% Percentile (z) 5.1 1296 95% UPL (t) 5.9 95% Percentile (z) 5.1 1296 95% UPL (t) 5.9 90% Percentile (z) 5.1		Data Not L	ognormal at	5% Significance Level	
1294 Background Statistics assuming Lognormal Distribution 1295 95% UTL with 95% Coverage 6.161 90% Percentile (z) 5.9 1296 95% UPL (t) 5.9 95% Percentile (z) 5.9					
1295 95% UTL with 95% Coverage 6.161 90% Percentile (z) 5. 1296 95% UPL (t) 5.9 95% Percentile (z) 5.		Background Sta	itistics assu	ming Lognormal Distribution	
1296 95% UPL (t) 5.9 95% Percentile (z) 5.		95% UTL with 95% Coverage	6.161	90% Percentile (z)	5.635
		95% UPL (t)	5.9	95% Percentile (z)	5.863
		95% USL	6.725	99% Percentile (z)	6.318
1298					
1299 Nonparametric Distribution Free Background Statistics		Nonparametric	Distribution	Free Background Statistics	
1300 Data do not follow a Discernible Distribution (0.05)		Data do not fo	ollow a Disc	ernible Distribution (0.05)	

	A B C D E	F	G H I J K I	
1301	A B C D E	Г	G N I J N	
	Nonparametric Upp	per Limits fo	r Background Threshold Values	
1302 1303	Order of Statistic, r	43		6.55
1303	Approx, f used to compute achieved CC	2.263		0.89
			Approximate Sample Size needed to achieve specified CC 5	59
1305 1306	95% Percentile Bootstrap UTL with 95% Coverage	6.533	95% BCA Bootstrap UTL with 95% Coverage	6.49
1300	95% UPL	6.294		5.772
1307	90% Chebyshev UPL	6.646	95% Percentile	5.936
1309	95% Chebyshev UPL	7.425	99% Percentile	6.479
1310	95% USL	6.55		
1311				
1312	Note: The use of USL tends to yield a conservati	ve estimate	of BTV, especially when the sample size starts exceeding 20.	
1312			e data set represents a background data set free of outliers	
1313	and consists of observa	ations collect	ed from clean unimpacted locations.	
	The use of USL tends to provide a balar	nce between	false positives and false negatives provided the data	
1315 1316			site observations need to be compared with the BTV.	
1317	-			
1210	pH-LAB (SU)			
1319				
	General Statistics			
1321	Total Number of Observations	42	Number of Distinct Observations 3	37
1322	Minimum	4.81	First Quartile	5.395
1323	Second Largest	7.24	Median	5.57
1323	Maximum	7.81	Third Quartile	5.73
1325	Mean	5.675	SD (0.612
1326	Coefficient of Variation	0.108	Skewness	1.72
1327	Mean of logged Data	1.731	SD of logged Data	0.101
1328				
1329	Critical Values f	or Backgrou	nd Threshold Values (BTVs)	
1330	Tolerance Factor K (For UTL)	2.104	d2max (for USL)	2.887
1331				
1332		Normal	GOF Test	
1333	Shapiro Wilk Test Statistic	0.808	Shapiro Wilk GOF Test	
1334	5% Shapiro Wilk Critical Value	0.942	Data Not Normal at 5% Significance Level	
1335	Lilliefors Test Statistic	0.224	Lilliefors GOF Test	
1336	5% Lilliofore Critical Value	0.135	Data Not Normal at 5% Significance Level	
1337		Normal at §	% Significance Level	
1338				
1339	Background S	tatistics Ass	uming Normal Distribution	
1340	OF% LITL with OF% Coverage	6.962	90% Percentile (z)	6.459
1341	95% UPL (t)	6.717	95% Percentile (z)	6.681
1342	95% USL	7.441	99% Percentile (z)	7.098
1343			· I	
1344		Gamma	GOF Test	
1345	A-D Test Statistic	2.305	Anderson-Darling Gamma GOF Test	
1346	5% A-D Critical Value	0.747	Data Not Gamma Distributed at 5% Significance Level	
1347	K-S Test Statistic	0.211	Kolmogorov-Smirnov Gamma GOF Test	
1348	5% K-S Critical Value	0.136	Data Not Gamma Distributed at 5% Significance Level	
1349	Data Not Com	na Distribut	ed at 5% Significance Level	
1350				
1350				

	A B C D E	F	G H I J K	L
1351		Gamma	Statistics	
1352	k hat (MLE)	96.93	k star (bias corrected MLE)	90.02
1353	Theta hat (MLE)	0.0585	Theta star (bias corrected MLE)	0.063
1354	nu hat (MLE)	8142	nu star (bias corrected)	7562
1355	MLE Mean (bias corrected)	5.675	MLE Sd (bias corrected)	0.598
1356				
1357	Background St	tatistics Ass	uming Gamma Distribution	
1358	95% Wilson Hilferty (WH) Approx. Gamma UPL	6.705	90% Percentile	6.454
1359	95% Hawkins Wixley (HW) Approx. Gamma UPL	6.704	95% Percentile	6.693
1360	95% WH Approx. Gamma UTL with 95% Coverage	6.97	99% Percentile	7.158
1361	95% HW Approx. Gamma UTL with 95% Coverage	6.971		
1362	95% WH USL	7.507	95% HW USL	7.517
1363				
1364		Lognorma	I GOF Test	
1365	Shapiro Wilk Test Statistic	0.848	Shapiro Wilk Lognormal GOF Test	
1366	5% Shapiro Wilk Critical Value	0.942	Data Not Lognormal at 5% Significance Level	
1367	Lilliefors Test Statistic	0.204	Lilliefors Lognormal GOF Test	
1368	5% Lilliefors Critical Value	0.135	Data Not Lognormal at 5% Significance Level	
1369	Data Not L	ognormal at	t 5% Significance Level	
1370				
1371			ming Lognormal Distribution	
1372	95% UTL with 95% Coverage	6.977	90% Percentile (z)	6.423
1373	95% UPL (t)	6.701	95% Percentile (z)	6.662
1374	95% USL	7.55	99% Percentile (z)	7.135
1375				
1376	-		Free Background Statistics	
1377	Data do not fe	ollow a Disc	ernible Distribution (0.05)	
1378	Name and the Unit		• D I	
1379	Order of Statistic, r	42	r Background Threshold Values 95% UTL with 95% Coverage	7.81
1380	Approx, f used to compute achieved CC	2.211	Approximate Actual Confidence Coefficient achieved by UTL	0.884
1381	Approx, i used to compute achieved CC	2.211	Approximate Actual Confidence Coefficient achieved by 01L Approximate Sample Size needed to achieve specified CC	59
1382	95% Percentile Bootstrap UTL with 95% Coverage	7.782	95% BCA Bootstrap UTL with 95% Coverage	7.777
1383	95% Percentile Bootstrap OTL with 95% Coverage 95% UPL	7.782	90% Percentile	6.424
1384	00% Chabyahay LIDI	7.532	95% Percentile	7.12
1385	05% Chebyshey UDI	8.373	99% Percentile	7.576
1386	95% USL	7.81		7.070
1387		7.01		
1388	Note: The use of USL tends to yield a concentration	ve estimate	of BTV, especially when the sample size starts exceeding 20.	
1389	Therefore, one may use LICL to estimate a DTV/		ne data set represents a background data set free of outliers	
1390		-	ed from clean unimpacted locations.	
1391			false positives and false negatives provided the data	
1392	represents a background data act and wi		isite observations need to be compared with the BTV.	
1393			· · · · · · · · · · · · · · · · · · ·	
1394	POTASSIUM, TOTAL (mg/L)			
1395				
1396	General Statistics			
1397	Tatal Number of Observations	43	Number of Distinct Observations	17
1200				
1398	Minimum	0	First Quartile	1.2
1398 1399 1400	Minimum	0	First Quartile Median	1.2

	A B C D E	F	G H I J K	
1401	Maximum	14.4	Third Quartile	1.9
1402	Mean	2.183	SD	2.686
	Coefficient of Variation	1.231	Skewness	3.448
1403		-		
1404		or Backgrou	Ind Threshold Values (BTVs)	
1405	Toloronoo Eastar K (Ear UTL)	2.097	d2max (for USL)	2.897
1406		2.037		2.037
1407		Normal	GOF Test	
1408				
1409		0.499	Shapiro Wilk GOF Test	
1410		0.943	Data Not Normal at 5% Significance Level	
1411		0.356	Lilliefors GOF Test	
1412		0.134	Data Not Normal at 5% Significance Level	
1413	Data Not	Normal at !	5% Significance Level	
1414				
1415	Background S	tatistics As	suming Normal Distribution	
1416	95% UTL with 95% Coverage	7.816	90% Percentile (z)	5.625
1417		6.753	95% Percentile (z)	6.601
1418	05% 1191	9.965	99% Percentile (z)	8.432
1419				
1420		Gamma	Statistics	
1420		nma Statisti	cs Not Available	
1422	Cann	ot Compute	Gamma Statistics!	
1423				
1424	Ca	anot Compu	te Log Statistics	
1425		inor compa		
1426		Distribution	Free Background Statistics	
1427	Data da natifi		cernible Distribution (0.05)	
1428				
1429				
1430		an Limite fo	r Deelvereund Threehold Veluee	
			r Background Threshold Values	
1431	Order of Statistic, r	43	95% UTL with 95% Coverage	14.4
	Order of Statistic, r		95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL	0.89
1431	Order of Statistic, r Approx, f used to compute achieved CC	43 2.263	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC	0.89 59
1431 1432	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage	43	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL	0.89
1431 1432 1433	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage	43 2.263	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC	0.89 59 13.66 3.02
1431 1432 1433 1434	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL	43 2.263 14.07	95% UTL with95% CoverageApproximate Actual Confidence Coefficient achieved by UTLApproximate Sample Size needed to achieve specified CC95% BCA Bootstrap UTL with95% Coverage	0.89 59 13.66
1431 1432 1433 1434 1435	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL	43 2.263 14.07 10.28	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% BCA Bootstrap UTL with 95% Coverage 90% Percentile	0.89 59 13.66 3.02
1431 1432 1433 1434 1435 1436 1437	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL 95% Chebyshev UPL	43 2.263 14.07 10.28 10.33	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% BCA Bootstrap UTL with 95% Coverage 90% Percentile 95% Percentile	0.89 59 13.66 3.02 6.93
1431 1432 1433 1434 1435 1436 1437 1438	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL 95% Chebyshev UPL 95% USL	43 2.263 14.07 10.28 10.33 14.03	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% BCA Bootstrap UTL with 95% Coverage 90% Percentile 95% Percentile	0.89 59 13.66 3.02 6.93
1431 1432 1433 1434 1435 1436 1437 1438 1439	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL 95% Chebyshev UPL 95% USL	43 2.263 14.07 10.28 10.33 14.03 14.4	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% BCA Bootstrap UTL with 95% Coverage 90% Percentile 95% Percentile	0.89 59 13.66 3.02 6.93
1431 1432 1433 1434 1435 1436 1437 1438 1439 1440	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL 95% Chebyshev UPL 95% USL 95% USL	43 2.263 14.07 10.28 10.33 14.03 14.4 ve estimate	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% BCA Bootstrap UTL with 95% Coverage 90% Percentile 95% Percentile	0.89 59 13.66 3.02 6.93
1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL 95% Chebyshev UPL 95% UPL 95% USL 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV	43 2.263 14.07 10.28 10.33 14.03 14.4 ve estimate only when t	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% BCA Bootstrap UTL with 95% Coverage 90% Percentile 95% Percentile 99% Percentile	0.89 59 13.66 3.02 6.93
1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL 95% Chebyshev UPL 95% Chebyshev UPL 95% USL 95% USL 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa	43 2.263 14.07 10.28 10.33 14.03 14.4 ve estimate only when the second s	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% BCA Bootstrap UTL with 95% Coverage 90% Percentile 95% Percentile 99% Percentile 99% Percentile	0.89 59 13.66 3.02 6.93
1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL 95% Chebyshev UPL 95% Chebyshev UPL 95% USL 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar	43 2.263 14.07 10.28 10.33 14.03 14.4 ve estimate only when the attions collect acce between	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% BCA Bootstrap UTL with 95% Coverage 90% Percentile 95% Percentile 99% Percentile 99% Percentile 0 f BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ted from clean unimpacted locations. false positives and false negatives provided the data	0.89 59 13.66 3.02 6.93
1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL 95% Chebyshev UPL 95% Chebyshev UPL 95% USL 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w	43 2.263 14.07 10.28 10.33 14.03 14.4 ve estimate only when the attions collect acce between	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% BCA Bootstrap UTL with 95% Coverage 90% Percentile 95% Percentile 99% Percentile 99% Percentile	0.89 59 13.66 3.02 6.93
1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL 95% Chebyshev UPL 95% Chebyshev UPL 95% USL 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w	43 2.263 14.07 10.28 10.33 14.03 14.4 ve estimate only when the attions collect acce between	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% BCA Bootstrap UTL with 95% Coverage 90% Percentile 95% Percentile 99% Percentile 99% Percentile 0 f BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ted from clean unimpacted locations. false positives and false negatives provided the data	0.89 59 13.66 3.02 6.93
1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL 95% Chebyshev UPL 95% Chebyshev UPL 95% USL 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w	43 2.263 14.07 10.28 10.33 14.03 14.4 ve estimate only when the attions collect acce between	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% BCA Bootstrap UTL with 95% Coverage 90% Percentile 95% Percentile 99% Percentile 99% Percentile 0 f BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ted from clean unimpacted locations. false positives and false negatives provided the data	0.89 59 13.66 3.02 6.93
1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL 95% Chebyshev UPL 95% Chebyshev UPL 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w SODIUM, TOTAL (mg/L)	43 2.263 14.07 10.28 10.33 14.03 14.4 ve estimate only when the attions collect acce between	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% BCA Bootstrap UTL with 95% Coverage 90% Percentile 95% Percentile 99% Percentile 99% Percentile 0 f BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ted from clean unimpacted locations. false positives and false negatives provided the data	0.89 59 13.66 3.02 6.93
1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL 95% Chebyshev UPL 95% Chebyshev UPL 95% USL 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w SODIUM, TOTAL (mg/L) General Statistics	43 2.263 14.07 10.28 10.33 14.03 14.4 ve estimate only when the ations collection ace between hen many of	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% BCA Bootstrap UTL with 95% Coverage 90% Percentile 95% Percentile 99% Percentile 99% Percentile 99% Percentile 100 100 100 100 100 100 100 100 100 10	0.89 59 13.66 3.02 6.93 13.01
1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447	Order of Statistic, r Approx, f used to compute achieved CC 95% Percentile Bootstrap UTL with 95% Coverage 95% UPL 90% Chebyshev UPL 95% Chebyshev UPL 95% Chebyshev UPL 95% USL Note: The use of USL tends to yield a conservati Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balar represents a background data set and w SODIUM, TOTAL (mg/L) General Statistics	43 2.263 14.07 10.28 10.33 14.03 14.4 ve estimate only when the tions collect ince between	95% UTL with 95% Coverage Approximate Actual Confidence Coefficient achieved by UTL Approximate Sample Size needed to achieve specified CC 95% BCA Bootstrap UTL with 95% Coverage 90% Percentile 95% Percentile 99% Percentile 99% Percentile 0 f BTV, especially when the sample size starts exceeding 20. ne data set represents a background data set free of outliers ted from clean unimpacted locations. false positives and false negatives provided the data	0.89 59 13.66 3.02 6.93

	A	В		C	D	E		=	G		Н	-		-	J		к	1
1451	~		`	<u>,</u>		econd Large			u				1		5		Median	15.7
1452						Maximu	m 24									Thire	d Quartile	18.35
1453						Меа	in 16.	.6									SD	2.507
1454	Coefficient of Variation							151								S	Skewness	1.08
1455					Mean	of logged Dat	a 2.	799							SD	of log	iged Data	0.143
1456																		
1457					С	ritical Values	s for Bac	kgrou	nd Thre	shold V	alues ((BTVs	5)					
1458				Tolera	ance Fact	or K (For UTI	_) 2.1	117							d	2max	(for USL)	2.868
1459																		
1460							No	rmal C	GOF Tes	t								
1461				Sh	apiro Will	< Test Statist	ic 0.8	876				Sł	napiro	Wilk	GOF Te	est		
1462				5% Sh	apiro Wilk	Critical Valu	e 0.9	94			Data	Not N	ormal	at 5%	Signific	cance	Level	
1463					Lilliefors	s Test Statist	ic 0.1	169					Lillief	ors G	OF Test	t		
1464				5%	6 Lilliefors	Critical Valu	ie 0.1	139			Data I	Not N	ormal	at 5%	Signific	cance	Level	
1465						Data N	ot Norm	al at 5	% Signi	icance	Level							
1466																		
1467						Background			uming N	ormal	Distrib	ution						
1468				95 <mark>% U</mark>	TL with	95% Coverag											centile (z)	19.81
1469						95% UPL (centile (z)	20.72
1470						95% US	L 23.	.78							99%	% Pero	centile (z)	22.43
1471																		
1472									GOF Tes	st								
1473						D Test Statist	-	476						-	amma (
1474						Critical Valu		746		Data						-	cance Lev	el
1475						S Test Statist		164		<u> </u>		-			Gamma			
1476						Critical Valu	-	139						buted	at 5% S	Signifi	cance Lev	el
1477						Data Not Gai	nma Dis	stribute	ed at 5%	Signifi	cance	Level						
1478							Ga	mma	Statistic									
1479						k hat (MLE			Statistic	5				k sta	r (hias (correc	ted MLE)	45.02
1480					Tł	neta hat (MLE		341					The		•		ted MLE)	0.369
1481						nu hat (MLE											corrected)	3601
1482				MI	F Mean (r	bias corrected									-		corrected)	2.473
1483																		
1484						Background	Statistic	s Assi	uming G	amma	Distrib	ution						
1485		95% Wils	son Hilfe	erty (Wł		. Gamma UP			U -						1	90% F	Percentile	19.83
1486 1487					,	. Gamma UP											Percentile	20.86
1487	95			•	,	95% Coverag											Percentile	22.88
1489	95	5% HW App	rox. Ga	mma U	TL with	95% Coverag	e 22.	.13										
1490						95% WH US	L 24.	.36								95%	HW USL	24.45
1491									L									
1492							Logr	normal	GOF T	est								
1493				Sh	apiro Will	< Test Statist	ic 0.8	898			Sh	apiro	Wilk	Logno	ormal G	OF T	est	
1494				5% Sh	apiro Wilk	Critical Valu	ie 0.9	94		[Data No	ot Log	Inorma	al at 5	% Signi	ificanc	e Level	
1495					Lilliefors	s Test Statist	ic 0.1	157				Lillief	ors Lo	gnorr	nal GOI	F Tes	t	
1496				5%	6 Lilliefors	Critical Valu	e 0.	139		[Data No	ot Log	Inorma	al at 5	% Signi	ificanc	e Level	
1497						Data No	Lognor	mal at	5% Sig	nificanc	e Leve	el						
1498																		
1499						ackground S		assur	ming Lo	norma	l Distri	butior	n					
1500				95 <mark>% U</mark>	TL with 9	95% Coverag	e 22.	.23							90%	% Pero	centile (z)	19.72

	A B C D E	F	G H I J K	
1501	95% UPL (t)	20.96	95% Percentile (z)	20.78
1502	95% USL	24.74	99% Percentile (z)	22.9
1503				
1504	Nonparametric	Distribution	Free Background Statistics	
1505	Data do not fo	ollow a Disc	ernible Distribution (0.05)	
1506				
1507	Nonparametric Upp	er Limits fo	r Background Threshold Values	
1508	Order of Statistic, r	40	95% UTL with 95% Coverage	24
1509	Approx, f used to compute achieved CC	2.105	Approximate Actual Confidence Coefficient achieved by UTL	0.871
1510			Approximate Sample Size needed to achieve specified CC	59
1511	95% Percentile Bootstrap UTL with 95% Coverage	24	95% BCA Bootstrap UTL with 95% Coverage	24
1512	95% UPL	22.2	90% Percentile	20
1513	90% Chebyshev UPL	24.21	95% Percentile	20.4
1514	95% Chebyshev UPL	27.66	99% Percentile	23.34
1515	95% USL	24		
1516				
1517	-		of BTV, especially when the sample size starts exceeding 20.	
1518	-		ne data set represents a background data set free of outliers	
1519			ted from clean unimpacted locations.	
1520			false positives and false negatives provided the data	
1521	represents a background data set and wh	nen many or	nsite observations need to be compared with the BTV.	
1522				
1523	SPEC. COND., FIELD (umhos/cm)			
1524				
1525	General Statistics Total Number of Observations	40		
1526		42 215	Number of Distinct Observations	33 308.3
1527	Minimum Second Largest	590	First Quartile Median	308.5
1528	Maximum	661	Third Quartile	350
1529	Mean	337.6	SD	79.31
1530	Coefficient of Variation	0.235	Skewness	2.351
1531	Mean of logged Data	5.8	SD of logged Data	0.205
1532		0.0		0.200
1533	Critical Values for	or Backgrou	ind Threshold Values (BTVs)	
1534	Tolerance Factor K (For UTL)	2.104	d2max (for USL)	2.887
1535			, , , , , , , , , , , , , , , , , , ,	
1536 1537		Normal (GOF Test	
1537	Shapiro Wilk Test Statistic	0.732	Shapiro Wilk GOF Test	
1539	5% Shapiro Wilk Critical Value	0.942	Data Not Normal at 5% Significance Level	
1540	Lilliefors Test Statistic	0.27	Lilliefors GOF Test	
1541	5% Lilliefors Critical Value	0.135	Data Not Normal at 5% Significance Level	
1542	Data Not	Normal at 5	5% Significance Level	
1543				
1544	Background S	tatistics Ass	suming Normal Distribution	
1545	95% UTL with 95% Coverage	504.4	90% Percentile (z)	439.2
1546	95% UPL (t)	472.6	95% Percentile (z)	468
	95% USL	566.6	99% Percentile (z)	522.1
1547				
1547	A-D Test Statistic	Gamma	GOF Test Anderson-Darling Gamma GOF Test	

	A B C D E	F	G H I J K	L
1551	5% A-D Critical Value	0.747	Data Not Gamma Distributed at 5% Significance Leve	el
1552	K-S Test Statistic	0.233	Kolmogorov-Smirnov Gamma GOF Test	
1553	5% K-S Critical Value	0.136	Data Not Gamma Distributed at 5% Significance Leve	əl
1554	Data Not Gamr	na Distribut	ed at 5% Significance Level	
1555				
1556		Gamma	Statistics	
1557	k hat (MLE)	22.84	k star (bias corrected MLE)	21.23
1558	Theta hat (MLE)	14.78	Theta star (bias corrected MLE)	15.9
1559	nu hat (MLE)	1919	nu star (bias corrected)	1783
1560	MLE Mean (bias corrected)	337.6	MLE Sd (bias corrected)	73.27
1561				
1562	Background St	tatistics Ass	suming Gamma Distribution	
1563	95% Wilson Hilferty (WH) Approx. Gamma UPL	468	90% Percentile	434.2
1564	95% Hawkins Wixley (HW) Approx. Gamma UPL	467.8	95% Percentile	466.4
1565	95% WH Approx. Gamma UTL with 95% Coverage	504.4	99% Percentile	531
1566	95% HW Approx. Gamma UTL with 95% Coverage	505		
1567	95% WH USL	581.2	95% HW USL	584.3
1568				
1569		Lognorma	I GOF Test	
1570	Shapiro Wilk Test Statistic	0.839	Shapiro Wilk Lognormal GOF Test	
1571	5% Shapiro Wilk Critical Value	0.942	Data Not Lognormal at 5% Significance Level	
1572	Lilliefors Test Statistic	0.217	Lilliefors Lognormal GOF Test	
1573	5% Lilliefors Critical Value	0.135	Data Not Lognormal at 5% Significance Level	
1574	Data Not L	.ognormal a	t 5% Significance Level	
1575				
1576	Background Sta	atistics assu	ming Lognormal Distribution	
1577	95% UTL with 95% Coverage	507.9	90% Percentile (z)	429.3
1578	95% UPL (t)	467.9	95% Percentile (z)	462.4
1579	95% USL	596.4	99% Percentile (z)	531.6
1580				
1581	Nonparametric	Distribution	Free Background Statistics	
1582	Data do not fe	ollow a Disc	cernible Distribution (0.05)	
1583				
1584	Nonparametric Upp	per Limits fo	r Background Threshold Values	
1585	Order of Statistic, r	42	95% UTL with 95% Coverage	661
1586	Approx, f used to compute achieved CC	2.211	Approximate Actual Confidence Coefficient achieved by UTL	0.884
1587			Approximate Sample Size needed to achieve specified CC	59
1588	95% Percentile Bootstrap UTL with 95% Coverage	657.5	95% BCA Bootstrap UTL with 95% Coverage	651.2
1589	95% UPL	571.4	90% Percentile	369.9
1590	90% Chebyshev UPL	578.3	95% Percentile	461.8
1591	95% Chebyshev UPL	687.4	99% Percentile	631.9
1592	95% USL	661		
1593			1	
1594	Note: The use of USL tends to yield a conservation	ve estimate	of BTV, especially when the sample size starts exceeding 20.	
<u> </u>	Therefore, one may use USL to estimate a BTV	only when the	he data set represents a background data set free of outliers	
1595			ted from clean unimpacted locations.	
1595 1596	and consists of observa	ations collect	the second se	
1596			false positives and false negatives provided the data	
1596 1597	The use of USL tends to provide a balan	nce between	•	
1596 1597 1598	The use of USL tends to provide a balan represents a background data set and whether the set and whether t	nce between	false positives and false negatives provided the data	
1596 1597 1598	The use of USL tends to provide a balan	nce between	false positives and false negatives provided the data	

	A B C D E	F	GHI	JK	L
1601			<u> </u>		
	General Statistics				
1603	Total Number of Observations	42	Numbe	r of Distinct Observations	35
1604	Minimum	242		First Quartile	278.3
1605	Second Largest	589		Median	302
1606	Maximum	656		Third Quartile	335
1607	Mean	322.2		SD	80.85
1608	Coefficient of Variation	0.251		Skewness	2.727
1609	Mean of logged Data	5.752		SD of logged Data	0.204
1610					
1611		-	d Threshold Values (BTVs)		
1612	Tolerance Factor K (For UTL)	2.104		d2max (for USL)	2.887
1613					
1614		Normal (
1615	Shapiro Wilk Test Statistic	0.691	•	ilk GOF Test	
1616	5% Shapiro Wilk Critical Value	0.942		5% Significance Level	
1617	Lilliefors Test Statistic	0.208		GOF Test	
1618	5% Lilliefors Critical Value	0.135		5% Significance Level	
1619	Data Not	Normal at 5	6 Significance Level		
1620					
1621			iming Normal Distribution		405.0
1622	95% UTL with 95% Coverage	492.3		90% Percentile (z)	425.8
1623	95% UPL (t)	459.9		95% Percentile (z)	455.2
1624	95% USL	555.7		99% Percentile (z)	510.3
1625		0			
1626	A-D Test Statistic	Gamma		Gamma GOF Test	
1627	5% A-D Critical Value	0.747		ted at 5% Significance Lev	
1628	K S Test Statistic	0.169		ov Gamma GOF Test	ei
1629	5% K-S Critical Value	0.136		ted at 5% Significance Lev	ما
1630			d at 5% Significance Level		
1631					
1632		Gamma	tatistics		
1633	k hat (MLE)	21.8		star (bias corrected MLE)	20.25
1634	Theta hat (MLE)	14.78		star (bias corrected MLE)	15.91
1635	nu hat (MLE)	1831		nu star (bias corrected)	1701
1636	MLE Mean (bias corrected)	322.2		MLE Sd (bias corrected)	71.6
1637 1638	, , ,, , ,, , ,, , ,, , , , , , , , , , , , , , , , , , , ,				
1639		atistics Ass	ming Gamma Distribution		
1640	05% Wilcon Hilforty (WH) Approx. Commo LIDI	449.7		90% Percentile	416.7
1641	95% Hawkins Wixley (HW) Approx. Gamma UPL	448.6		95% Percentile	448.3
1642	95% WH Approx. Gamma UTL with 95% Coverage	485.5		99% Percentile	511.7
1643	95% HW Approx. Gamma UTL with 95% Coverage	484.9			
1644	95% WH USL	561		95% HW USL	562.3
1645					
1646		Lognorma	GOF Test		
	Shapiro Wilk Test Statistic	0.804	Shapiro Wilk Log	gnormal GOF Test	
1647		0.040	Data Nat Lagnarmal a	at 5% Significance Level	
1647 1648	5% Shapiro Wilk Critical Value	0.942	Data Not Logitornal a	it 5 % Significance Level	
1647 1648 1649	5% Shapiro Wilk Critical Value Lilliefors Test Statistic	0.942	-	ormal GOF Test	

	A B C D E	F	G H I J K	L
1651		ognormal a	5% Significance Level	
1652				
1653	Background Sta	tistics assu	ming Lognormal Distribution	
1654	95% UTL with 95% Coverage	483.6	90% Percentile (z)	409
1655	95% UPL (t)	445.7	95% Percentile (z)	440.4
1656	95% USL	567.5	99% Percentile (z)	506.1
1657			· · · · · · · · · · · · · · · · · · ·	
1658	Nonparametric	Distribution	Free Background Statistics	
1659	Data do not fo	ollow a Disc	ernible Distribution (0.05)	
1660				
1661			r Background Threshold Values	
1662	Order of Statistic, r	42	95% UTL with 95% Coverage	656
1663	Approx, f used to compute achieved CC	2.211	Approximate Actual Confidence Coefficient achieved by UTL	0.884
1664			Approximate Sample Size needed to achieve specified CC	59
1665	95% Percentile Bootstrap UTL with 95% Coverage	652.7	95% BCA Bootstrap UTL with 95% Coverage	645.8
1666	95% UPL	568.5	90% Percentile	380.5
1667	90% Chebyshev UPL	567.7	95% Percentile	449.3
1668	95% Chebyshev UPL	678.8	99% Percentile	628.5
1669	95% USL	656		
1670				
1671			of BTV, especially when the sample size starts exceeding 20.	
1672			ne data set represents a background data set free of outliers	
1673			ed from clean unimpacted locations.	
1674			false positives and false negatives provided the data	
			the second se	
1675		nen many or	site observations need to be compared with the BTV.	
1676		nen many or	site observations need to be compared with the BTV.	
1676	SULFATE (mg/L)	nen many or	nsite observations need to be compared with the BTV.	
1676 1677 1678	SULFATE (mg/L)	nen many or	nsite observations need to be compared with the BTV.	
1676 1677 1678 1679	SULFATE (mg/L) General Statistics			38
1676 1677 1678 1679 1680	SULFATE (mg/L) General Statistics Total Number of Observations	42	Number of Distinct Observations	38
1676 1677 1678 1679 1680 1681	SULFATE (mg/L) General Statistics Total Number of Observations Minimum	42 6.9	Number of Distinct Observations First Quartile	9.875
1676 1677 1678 1679 1680 1681 1682	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest	42 6.9 60.4	Number of Distinct Observations First Quartile Median	9.875 12.3
1676 1677 1678 1679 1680 1681 1682 1683	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum	42 6.9 60.4 74	Number of Distinct Observations First Quartile Median Third Quartile	9.875 12.3 23.2
1676 1677 1678 1679 1680 1681 1682 1683 1684	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean	42 6.9 60.4 74 20.09	Number of Distinct Observations First Quartile Median Third Quartile SD	9.875 12.3 23.2 15.82
1676 1677 1678 1679 1680 1681 1682 1683 1684 1685	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation Moon of logged Data	42 6.9 60.4 74 20.09 0.788	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness	9.875 12.3 23.2 15.82 1.788
1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation Moon of logged Data	42 6.9 60.4 74 20.09	Number of Distinct Observations First Quartile Median Third Quartile SD	9.875 12.3 23.2 15.82
1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation Mean of logged Data	42 6.9 60.4 74 20.09 0.788 2.773	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness	9.875 12.3 23.2 15.82 1.788
1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1685 1686 1687 1688	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation Mean of logged Data	42 6.9 60.4 74 20.09 0.788 2.773	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data	9.875 12.3 23.2 15.82 1.788
1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for	42 6.9 60.4 74 20.09 0.788 2.773	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data nd Threshold Values (BTVs)	9.875 12.3 23.2 15.82 1.788 0.641
1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for	42 6.9 60.4 74 20.09 0.788 2.773 or Backgrou 2.104	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data nd Threshold Values (BTVs)	9.875 12.3 23.2 15.82 1.788 0.641
1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1685 1686 1687 1688 1689 1690	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for	42 6.9 60.4 74 20.09 0.788 2.773 or Backgrou 2.104	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data nd Threshold Values (BTVs) d2max (for USL)	9.875 12.3 23.2 15.82 1.788 0.641
1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1685 1686 1687 1688 1689 1690 1691	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for Tolerance Factor K (For UTL)	42 6.9 60.4 74 20.09 0.788 2.773 or Backgrou 2.104 Normal (Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data nd Threshold Values (BTVs) d2max (for USL)	9.875 12.3 23.2 15.82 1.788 0.641
1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1685 1686 1687 1688 1689 1690 1691 1692	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for Tolerance Factor K (For UTL) Shapiro Wilk Test Statistic	42 6.9 60.4 74 20.09 0.788 2.773 or Backgrou 2.104 Normal (0.734	Number of Distinct Observations First Quartile Median Third Quartile SD SD SD SD of logged Data Ind Threshold Values (BTVs) d2max (for USL) GOF Test Shapiro Wilk GOF Test	9.875 12.3 23.2 15.82 1.788 0.641
1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1685 1685 1686 1687 1688 1689 1690 1691 1692 1693	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for Tolerance Factor K (For UTL) Shapiro Wilk Test Statistic 5% Shapiro Wilk Critical Value	42 6.9 60.4 74 20.09 0.788 2.773 or Backgrou 2.104 Normal (0.734 0.942	Number of Distinct Observations First Quartile Median Third Quartile SD SD SL SD of logged Data Ind Threshold Values (BTVs) d2max (for USL) GOF Test Data Not Normal at 5% Significance Level	9.875 12.3 23.2 15.82 1.788 0.641
1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for Tolerance Factor K (For UTL) Shapiro Wilk Test Statistic 5% Shapiro Wilk Critical Value Lilliefors Test Statistic 5% Lilliefors Critical Value	42 6.9 60.4 74 20.09 0.788 2.773 or Backgrou 2.104 Normal (0.734 0.942 0.249 0.135	Number of Distinct Observations First Quartile Median Third Quartile SD SD Skewness SD of logged Data nd Threshold Values (BTVs) d2max (for USL) GOF Test Data Not Normal at 5% Significance Level Lilliefors GOF Test	9.875 12.3 23.2 15.82 1.788 0.641
1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for Tolerance Factor K (For UTL) Shapiro Wilk Test Statistic 5% Shapiro Wilk Critical Value Lilliefors Test Statistic 5% Lilliefors Critical Value	42 6.9 60.4 74 20.09 0.788 2.773 or Backgrou 2.104 Normal (0.734 0.942 0.249 0.135	Number of Distinct Observations First Quartile Median Third Quartile SD SD Skewness SD of logged Data nd Threshold Values (BTVs) d2max (for USL) GOF Test Data Not Normal at 5% Significance Level Lilliefors GOF Test Data Not Normal at 5% Significance Level	9.875 12.3 23.2 15.82 1.788 0.641
1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696 1697	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for Tolerance Factor K (For UTL) Shapiro Wilk Test Statistic 5% Shapiro Wilk Critical Value Lilliefors Test Statistic 5% Lilliefors Critical Value Data Not	42 6.9 60.4 74 20.09 0.788 2.773 or Backgrou 2.104 Normal (0.734 0.942 0.249 0.135 Normal at §	Number of Distinct Observations First Quartile Median Third Quartile SD SD Skewness SD of logged Data nd Threshold Values (BTVs) d2max (for USL) GOF Test Data Not Normal at 5% Significance Level Lilliefors GOF Test Data Not Normal at 5% Significance Level	9.875 12.3 23.2 15.82 1.788 0.641
1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696	SULFATE (mg/L) General Statistics Total Number of Observations Minimum Second Largest Maximum Mean Coefficient of Variation Mean of logged Data Critical Values for Tolerance Factor K (For UTL) Shapiro Wilk Test Statistic 5% Shapiro Wilk Critical Value Lilliefors Test Statistic 5% Lilliefors Critical Value Data Not	42 6.9 60.4 74 20.09 0.788 2.773 or Backgrou 2.104 Normal (0.734 0.942 0.249 0.135 Normal at §	Number of Distinct Observations First Quartile Median Third Quartile SD Skewness SD of logged Data nd Threshold Values (BTVs) d2max (for USL) GOF Test Data Not Normal at 5% Significance Level Lilliefors GOF Test Data Not Normal at 5% Significance Level % Significance Level	9.875 12.3 23.2 15.82 1.788 0.641

	ABCDE	F	GHIJK	
1701	95% USL	65.78	99% Percentile (z)	56.9
1702				
1703		Gamma	GOF Test	
1704	A-D Test Statistic	2.135	Anderson-Darling Gamma GOF Test	
1705	5% A-D Critical Value	0.758	Data Not Gamma Distributed at 5% Significance Level	
1706	K-S Test Statistic	0.233	Kolmogorov-Smirnov Gamma GOF Test	
1707	5% K-S Critical Value	0.138	Data Not Gamma Distributed at 5% Significance Level	
1708	Data Not Gamr	na Distribute	ed at 5% Significance Level	
1709				
1710		Gamma	Statistics	
1711	k hat (MLE)	2.355	k star (bias corrected MLE)	2.202
1712	Theta hat (MLE)	8.53	Theta star (bias corrected MLE)	9.12
1713	nu hat (MLE)	197.8		185
1714	MLE Mean (bias corrected)	20.09	MLE Sd (bias corrected)	13.53
1715				
1716	_		uming Gamma Distribution	
1717	95% Wilson Hilferty (WH) Approx. Gamma UPL	46.52	90% Percentile	38.19
1718	95% Hawkins Wixley (HW) Approx. Gamma UPL	46.68	95% Percentile	46.23
1719	95% WH Approx. Gamma UTL with 95% Coverage	56.44	99% Percentile	63.94
1720	95% HW Approx. Gamma UTL with 95% Coverage	57.37		00.47
1721	95% WH USL	79.72	95% HW USL	83.47
1722		Lognormo	GOF Test	
1723	Shapiro Wilk Test Statistic	0.858	Shapiro Wilk Lognormal GOF Test	
1724	5% Shapiro Wilk Critical Value	0.858	Data Not Lognormal at 5% Significance Level	
1725	Lilliefors Test Statistic	0.208	Lilliefors Lognormal GOF Test	
1726	5% Lilliefors Critical Value	0.135	Data Not Lognormal at 5% Significance Level	
1727			5% Significance Level	
1728				
1729 1730	Background Sta	tistics assu	ning Lognormal Distribution	
1731	95% UTL with 95% Coverage	61.66	90% Percentile (z)	36.4
1732	95% UPL (t)	47.69	95% Percentile (z)	45.95
1733	95% USL	101.9	99% Percentile (z)	71.13
1734				
1735	Nonparametric	Distribution	Free Background Statistics	
1736	Data do not fe	ollow a Disc	ernible Distribution (0.05)	
1737				
1738		er Limits fo	Background Threshold Values	
1739	Order of Statistic, r	42	95% UTL with 95% Coverage	74
1740	Approx, f used to compute achieved CC	2.211	Approximate Actual Confidence Coefficient achieved by UTL	0.884
1741			Approximate Sample Size needed to achieve specified CC	59
1742	95% Percentile Bootstrap UTL with 95% Coverage	73.32	95% BCA Bootstrap UTL with 95% Coverage	72.88
1743	95% UPL	59.1	90% Percentile	42.18
1744	90% Chebyshev UPL	68.12	95% Percentile	51.48
1745	95% Chebyshev UPL	89.88	99% Percentile	68.42
1746	95% USL	74		
1747				
1748	-		of BTV, especially when the sample size starts exceeding 20.	
1749	-		e data set represents a background data set free of outliers	
1750	and consists of observa	tions collect	ed from clean unimpacted locations.	

	A B C D E	F	G Н I Ј К I	
1751	-	nce between	false positives and false negatives provided the data	_
1752	represents a background data set and wi	hen many or	nsite observations need to be compared with the BTV.	
1753				
1754	Total Dissolved Solids (mg/L)			
1755				
1756	General Statistics			
1757	Total Number of Observations	42	Number of Distinct Observations	40
1758	Minimum	135	First Quartile	201.8
1759	Second Largest	381	Median	237
1760	Maximum	433	Third Quartile	261
1761	Mean	236.1	SD	58.29
1762	Coefficient of Variation	0.247	Skewness	1.113
1763	Mean of logged Data	5.437	SD of logged Data	0.237
1764		l		
1765	Critical Values f	or Backgrou	ind Threshold Values (BTVs)	
1766	Tolerance Factor K (For UTL)	2.104	d2max (for USL)	2.887
1767			1	
1768		Normal	GOF Test	
1769	Shapiro Wilk Test Statistic	0.893	Shapiro Wilk GOF Test	
1770	5% Shapiro Wilk Critical Value	0.942	Data Not Normal at 5% Significance Level	
1771	Lilliefors Test Statistic	0.127	Lilliefors GOF Test	
1772	5% Lilliefors Critical Value	0.135	Data appear Normal at 5% Significance Level	
1773	Data appear App	roximate No	rmal at 5% Significance Level	
1774				
1775	-	statistics Ass	suming Normal Distribution	
1776	95% UTL with 95% Coverage	358.8	90% Percentile (z)	310.8
1777	95% UPL (t)	335.4	95% Percentile (z)	332
1778	95% USL	404.4	99% Percentile (z)	371.7
1779				
1780		r	GOF Test	
1781	A-D Test Statistic	0.609	Anderson-Darling Gamma GOF Test	
1782	5% A-D Critical Value	0.747	Detected data appear Gamma Distributed at 5% Significant	ce Level
1783	K-S Test Statistic	0.106	Kolmogorov-Smirnov Gamma GOF Test	
1784	5% K-S Critical Value	0.136	Detected data appear Gamma Distributed at 5% Significant	ce Level
1785		r Gamma Di	stributed at 5% Significance Level	
1786		Gamma	Statistics	
1787	k hat (MLE)	Gamma 18.13	k star (bias corrected MLE)	16.85
1788	Theta hat (MLE)	13.03	Theta star (bias corrected MLE)	14.02
1789	nu hat (MLE)		nu star (bias corrected MLE)	14.02
1790	MLE Mean (bias corrected)	236.1	MLE Sd (bias corrected)	57.53
1791		200.1		57.55
1792	Rackaround S	tatistics Ass	suming Gamma Distribution	
1793	95% Wilson Hilferty (WH) Approx. Gamma UPL	339.5	90% Percentile	312.2
1794	95% Hawkins Wixley (HW) Approx. Gamma UPL	340.5	95% Percentile	338.1
1795	95% WH Approx. Gamma UTL with 95% Coverage	369	99% Percentile	390.1
1796	95% HW Approx. Gamma UTL with 95% Coverage	371		
1797	95% WH USL	431.5	95% HW USL	436.6
1798				
1799		Loanorma	I GOF Test	
1800				

	A B C D E	F	G H I J K	L
1801	Shapiro Wilk Test Statistic	0.936	Shapiro Wilk Lognormal GOF Test	
1802	5% Shapiro Wilk Critical Value	0.942	Data Not Lognormal at 5% Significance Level	
1803	Lilliofore Test Statistic	0.12	Lilliefors Lognormal GOF Test	
1804	5% Lilliofors Critical Value	0.135	Data appear Lognormal at 5% Significance Level	
1805	Data appear Appro	ximate Log	normal at 5% Significance Level	
1806				
1807	Bookground Sto	itistics assu	uming Lognormal Distribution	
1808	05% LITL with 05% Coverage	378.1	90% Percentile (z)	311.2
1809		343.9	95% Percentile (z)	339.2
1810	05% 1191	455.3	99% Percentile (z)	398.6
1811				
1812	Nonparametric	Distributior	n Free Background Statistics	
1813	Data appear Appr	roximate No	ormal at 5% Significance Level	
1814	Nonnarametric Unn	er Limits fo	or Background Threshold Values	
1815	Order of Statistic r	42	95% UTL with 95% Coverage	433
1816	Approx, fuend to compute pobloved CC	2.211	Approximate Actual Confidence Coefficient achieved by UTL	0.884
1817			Approximate Sample Size needed to achieve specified CC	59
1818	95% Porceptile Bootstrap LITL with 95% Coverage	430.4	95% BCA Bootstrap UTL with 95% Coverage	427.9
1819	05% LIDI	373.5	90% Percentile	292.2
1820	00% Chebychey LIDI	413.1	95% Percentile	330
1821	95% Chobychov LIPI	493.2	99% Percentile	411.7
1822	05% LISI			
1823	95% USL	433		
1823 1824	95% USL	433		
1823 1824 1825	95% USL Note: The use of USL tends to yield a conservation Therefore, one may use USL to actimate a BTV	433 ve estimate	of BTV, especially when the sample size starts exceeding 20.	
1823 1824 1825 1826	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV	433 ve estimate only when t	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers	
1823 1824 1825 1826 1827	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa	433 ve estimate only when t tions collec	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ted from clean unimpacted locations.	
1823 1824 1825 1826 1827 1828	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan	433 ve estimate only when t tions collec	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ted from clean unimpacted locations. In false positives and false negatives provided the data	
1823 1824 1825 1826 1827 1828 1829	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh	433 ve estimate only when t tions collec	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ted from clean unimpacted locations.	
1823 1824 1825 1826 1827 1828 1829 1830	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh	433 ve estimate only when t tions collec	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ted from clean unimpacted locations. In false positives and false negatives provided the data	
1823 1824 1825 1826 1827 1828 1829 1830 1831	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wf	433 ve estimate only when t tions collec	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ted from clean unimpacted locations. In false positives and false negatives provided the data	
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh TETRACHLOROETHENE (ug/L)	433 ve estimate only when t tions collec ice between nen many o	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ted from clean unimpacted locations. In false positives and false negatives provided the data nsite observations need to be compared with the BTV.	
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh TETRACHLOROETHENE (ug/L)	433 ve estimate only when t tions collec ice between nen many o General	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ted from clean unimpacted locations. In false positives and false negatives provided the data insite observations need to be compared with the BTV.	0
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh TETRACHLOROETHENE (ug/L)	433 ve estimate only when t tions collec ice between nen many o	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ted from clean unimpacted locations. In false positives and false negatives provided the data nsite observations need to be compared with the BTV.	0
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh TETRACHLOROETHENE (ug/L) Total Number of Observations Number of Distinct Observations	433 ve estimate only when t tions collec ice between nen many o General 45	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ited from clean unimpacted locations. In false positives and false negatives provided the data insite observations need to be compared with the BTV. Statistics Number of Missing Observations	
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh TETRACHLOROETHENE (ug/L)	433 ve estimate only when t tions collec ice between nen many o General 45 1 0	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ited from clean unimpacted locations. In false positives and false negatives provided the data Insite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects	45
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh TETRACHLOROETHENE (ug/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects	433 ve estimate only when t tions collec ice between nen many o General 45 1 0 0	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ited from clean unimpacted locations. n false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects	45 1
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh TETRACHLOROETHENE (ug/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect	433 ve estimate only when t tions collec ice between nen many o General 45 1 0 0 0 N/A	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ited from clean unimpacted locations. in false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect	45 1 1
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and whether TETRACHLOROETHENE (ug/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect	433 ve estimate only when t tions collec ice between nen many o General 45 1 0 0 N/A N/A	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ited from clean unimpacted locations. in false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect	45 1 1 1
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1839 1840	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wt TETRACHLOROETHENE (ug/L) Total Number of Observations Number of Distinct Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect	433 ve estimate only when t tions collec ice between nen many o General 45 1 0 0 N/A N/A N/A	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ited from clean unimpacted locations. in false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Percent Non-Detects	45 1 1 1 100%
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh TETRACHLOROETHENE (ug/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected	433 ve estimate only when t tions collec ice between nen many o General 45 1 0 0 N/A N/A N/A N/A	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ited from clean unimpacted locations. in false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Maximum Non-Detects Statistics	45 1 1 1 100% N/A
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wt TETRACHLOROETHENE (ug/L) Total Number of Observations Number of Distinct Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean Detected Mean of Detected Logged Data	433 ve estimate only when t tions collec ice between nen many o General 45 1 0 0 N/A N/A N/A	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ited from clean unimpacted locations. in false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Percent Non-Detects	45 1 1 1 100%
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1839 1840 1841 1842 1843	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wf TETRACHLOROETHENE (ug/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Waximum Detectd Mean Detected Mean of Detected Logged Data	433 ve estimate only when t tions collec ice between nen many o General 45 1 0 0 N/A N/A N/A N/A N/A N/A	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ited from clean unimpacted locations. in false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Maximum Non-Detects SD Detected SD of Detected Logged Data	45 1 1 1 100% N/A
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1835 1835 1835 1836 1837 1838 1839 1840 1841 1842 1843	95% USL Note: The use of USL tends to yield a conservation Therefore, one may use USL to estimate a BTV and consists of observation The use of USL tends to provide a balan represents a background data set and wr TETRACHLOROETHENE (ug/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean of Detected Logged Data Warning: All observations are Non-Detects	433 ve estimate only when t tions collec ice between nen many o General 45 1 0 0 N/A N/A N/A N/A N/A N/A N/A S (NDS), the	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ted from clean unimpacted locations. n false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Statistics Number of Missing Observations Number of Distinct Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Percent Non-Detects SD Detected SD of Detected Logged Data	45 1 1 1 100% N/A
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1844 1845	95% USL Note: The use of USL tends to yield a conservativ Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and wh TETRACHLOROETHENE (ug/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and	433 ve estimate only when t tions collec ice between nen many o General 45 1 0 0 N/A N/A N/A N/A N/A N/A N/A N/A S (NDS), the d other stat	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ted from clean unimpacted locations. n false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Percent Non-Detects SD Detected SD of Detected Logged Data	45 1 1 100% N/A N/A
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1844 1845 1846	95% USL Note: The use of USL tends to yield a conservation Therefore, one may use USL to estimate a BTV and consists of observation The use of USL tends to provide a balan represents a background data set and with TETRACHLOROETHENE (ug/L) Total Number of Observations Number of Distinct Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean of Detected Logged Data Warning: All observations are Non-Detect Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si	433 ve estimate only when t tions collec ice between nen many o General 45 1 0 0 N/A N/A N/A N/A N/A N/A N/A N/A S (NDS), the d other stat	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ted from clean unimpacted locations. n false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Statistics Number of Missing Observations Number of Distinct Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Percent Non-Detects SD Detected SD of Detected Logged Data	45 1 1 100% N/A N/A
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1844 1845 1846 1847	95% USL Note: The use of USL tends to yield a conservation Therefore, one may use USL to estimate a BTV and consists of observation The use of USL tends to provide a balan represents a background data set and with TETRACHLOROETHENE (ug/L) Total Number of Observations Number of Distinct Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Number of Distinct Detects Minimum Detect Waximum Detect Variance Detected Mean Of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si	433 ve estimate only when t tions collec ice between nen many of General 45 1 0 0 N/A N/A N/A N/A N/A N/A N/A N/A S (NDs), the d other stati	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ited from clean unimpacted locations. n false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Percent Non-Detects SD Detected SD of Detected Logged Data	45 1 1 100% N/A N/A
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1844 1845 1844 1845 1846 1847 1848	95% USL Note: The use of USL tends to yield a conservation Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and whether TETRACHLOROETHENE (ug/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si	433 ve estimate only when t tions collec ice between nen many of General 45 1 0 0 N/A N/A N/A N/A N/A N/A N/A N/A S (NDs), the d other stati	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ted from clean unimpacted locations. n false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Percent Non-Detects SD Detected SD of Detected Logged Data	45 1 1 100% N/A N/A
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1844 1845 1846 1847	95% USL Note: The use of USL tends to yield a conservation Therefore, one may use USL to estimate a BTV and consists of observa The use of USL tends to provide a balan represents a background data set and whether TETRACHLOROETHENE (ug/L) Total Number of Observations Number of Distinct Observations Number of Distinct Detects Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detected Mean Detected Mean of Detected Logged Data Warning: All observations are Non-Detects Specifically, sample mean, UCLs, UPLs, and The Project Team may decide to use alternative si	433 ve estimate only when t tions collec ice between nen many of General 45 1 0 0 N/A N/A N/A N/A N/A N/A N/A N/A S (NDs), the d other stati	of BTV, especially when the sample size starts exceeding 20. he data set represents a background data set free of outliers ited from clean unimpacted locations. n false positives and false negatives provided the data nsite observations need to be compared with the BTV. Statistics Number of Missing Observations Number of Non-Detects Number of Distinct Non-Detects Minimum Non-Detect Percent Non-Detects SD Detected SD of Detected Logged Data	45 1 1 100% N/A N/A

	A B C D E	F	G H I J K	L
1851	TOTAL ORGANIC CARBON (mg/L)			
1852				
1853			Statistics	
1854	Total Number of Observations	42	Number of Missing Observations	0
1855	Number of Distinct Observations	13		
1856	Number of Detects	12	Number of Non-Detects	30
1857	Number of Distinct Detects	11	Number of Distinct Non-Detects	2
1858	Minimum Detect	0.6	Minimum Non-Detect	0.5
1859		1.4	Maximum Non-Detect	1
1860	Variance Detected	0.0659	Percent Non-Detects	71.43%
1861	Mean Detected	0.887	SD Detected	0.257
1862	Mean of Detected Logged Data	-0.157	SD of Detected Logged Data	0.278
1863				
1864	Critical Values for	or Backgrou	nd Threshold Values (BTVs)	
1865	Tolerance Factor K (For UTL)	2.104	d2max (for USL)	2.887
1866				
1867	Norm	al GOF Tes	t on Detects Only	
1868	Shapiro Wilk Test Statistic	0.912	Shapiro Wilk GOF Test	
1869	5% Shapiro Wilk Critical Value	0.859	Detected Data appear Normal at 5% Significance Leve	el
1870	Lilliefors Test Statistic	0.177	Lilliefors GOF Test	
1871	5% Lilliefors Critical Value	0.243	Detected Data appear Normal at 5% Significance Leve	el
1872	Detected Data a	appear Norn	nal at 5% Significance Level	
1873				
1874	Kaplan Meier (KM) Back	kground Sta	tistics Assuming Normal Distribution	
1875	KM Mean	0.695	KM SD	0.212
1876	95% UTL95% Coverage	1.141	95% KM UPL (t)	1.056
1877	90% KM Percentile (z)	0.966	95% KM Percentile (z)	1.043
1878	99% KM Percentile (z)	1.188	95% KM USL	1.307
1879				
1880	DL/2 Substitution Back	ground Stat	stics Assuming Normal Distribution	
1881		0.581	SD	0.25
1882	95% UTL95% Coverage	1.106	95% UPL (t)	1.006
1883	90% Percentile (z)	0.901	95% Percentile (z)	0.992
1884	99% Percentile (z)	1.162	95% USL	1.302
1885	DL/2 is not a recommended meth	od. DL/2 pro	ovided for comparisons and historical reasons	
1886				
1887		Tests on De	etected Observations Only	
1888		0.365	Anderson-Darling GOF Test	
1889	EV A D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance	e Level
1890		0.155	Kolmogorov-Smirnov GOF	
1891	5% K-S Critical Value	0.245	Detected data appear Gamma Distributed at 5% Significance	e Level
1892	Detected data appear	[.] Gamma Di	stributed at 5% Significance Level	
1893				
1894	Commo	Statistics or	Detected Data Only	
1895	k bot (MLE)	13.9	k star (bias corrected MLE)	10.48
1896	Those bot (MLE)	0.0638	Theta star (bias corrected MLE)	0.0846
1897	pu bot (MLE)	333.7	nu star (bias corrected)	251.6
1898	MLE Moon (bios corrected)	0.887		
1899	MIESd (bias corrected)	0.274	95% Percentile of Chisquare (2kstar)	32.63
1900				

	A B C D	E	F	GHIJ	К	L		
1901		amma ROS	Statistics u	sing Imputed Non-Detects				
1902	GROS may not be used w	when data s	et has > 50%	6 NDs with many tied observations at multiple	DLs			
1903	· · · · · · · · · · · · · · · · · · ·			s <1.0, especially when the sample size is sm	all (e.g., <15-20)			
1904	For such situation	ons, GROS i	method may	yield incorrect values of UCLs and BTVs				
1905	TI	nis is especi	ally true whe	en the sample size is small.				
1906	For gamma distributed detected d	lata, BTVs a	nd UCLs ma	y be computed using gamma distribution on k	M estimates			
1907		Minimum	0.193		Mean	0.652		
1908		Maximum	1.4		Median	0.63		
1909		SD	0.27		CV	0.414		
1910		k hat (MLE)	5.701		corrected MLE)	5.309		
1911		a hat (MLE)	0.114		corrected MLE)	0.123		
1912		u hat (MLE)	478.8		(bias corrected)	446		
1913	MLE Mean (bias		0.652	MLE Sc	(bias corrected)	0.283		
1914	95% Percentile of Chisqu		19.16		90% Percentile	1.03		
1915		6 Percentile	1.176		99% Percentile	1.482		
1916	•		•	g Gamma ROS Statistics on Imputed Data				
1917		-		H) and Hawkins Wixley (HW) Methods		1.15.47		
1918	95% Approx. Gamma UTL with 95% Coverage	WH 1.36	HW 1.391	0E% Approx Commo	WH JPL 1.187	HW		
1919	95% Approx. Gamma UTL with 95% Coverage 95% Gamma USL	1.745	1.819	95% Approx. Gamma	JPL 1.107	1.204		
1920	95% Gamma USL	1.745	1.019					
1921	Ect	imates of G	amma Dara	meters using KM Estimates				
1922		Mean (KM)	0.695		SD (KM)	0.212		
1923		riance (KM)	0.0449		SE of Mean (KM)	0.0447		
1924	Val	k hat (KM)	10.74		k star (KM)	9.99		
1925		nu hat (KM)	902.3		nu star (KM)	839.1		
1926		eta hat (KM)	0.0647		theta star (KM)	0.0695		
1927	80% gamma perc	. ,	0.87	90% gamma	percentile (KM)	0.987		
1928 1929	95% gamma perc	centile (KM)	1.091	99% gamma	percentile (KM)	1.305		
1930								
1931	The following sta	tistics are c	omputed us	ing gamma distribution and KM estimates				
1932	Upper Limits u	ising Wilsor	n Hilferty (W	H) and Hawkins Wixley (HW) Methods				
1933		WH	HW		WH	HW		
1934	95% Approx. Gamma UTL with 95% Coverage	1.167	1.172	95% Approx. Gamma	JPL 1.059	1.061		
1935	95% KM Gamma Percentile	1.044	1.045	95% Gamma	JSL 1.398	1.415		
1936								
1937		-		etected Observations Only				
1938	Shapiro Wilk To		0.941	Shapiro Wilk GOF				
1939	5% Shapiro Wilk Ci		0.859	Detected Data appear Lognormal at §	-	evel		
1940		est Statistic	0.151	Lilliefors GOF Te				
1941								
1942	Detec	xed Data ap	pear Logno	rmal at 5% Significance Level				
1943	Destante de 1977	0.04-41-41	A		-1			
1944			-	Lognormal Distribution Using Imputed Non-D		-0.444		
1945	Mean in Ori	-	0.678	M	ean in Log Scale SD in Log Scale	0.337		
1946	SD in Ori 95% UTL95%	iginal Scale	1.302		SD in Log Scale	1.2		
1947	95% Bootstrap (%) UTL95%	•	1.302	93% DCA U	95% UPL (t)	1.2		
1948		ercentile (z)	0.987		95% UPL (t)	1.138		
1949		ercentile (z)	1.404	93	95% USL	1.695		
1950	99% P6	ercentile (Z)	1.404		90 % USL	1.090		

	^			С		D	-	E	F			н	- T					—		—	
1951	A	В		U		D		E	F	G		п		I		J			K		
1951				Sta	tistics	s using	KM e	stimate	s on Logged	Data and	l Assu	ming L	.ognc	rmal C	Distribu	ition					
1953					KM	Mean of	f Log	ged Da	a -0.405			1	95%	KM UT	L (Log	norma	al)95°	% Cc	overage	э	1.191
1954					K	M SD of	f Log	ged Da	a 0.275						959	6 KM ι	JPL	(Log	normal))	1.066
1955				95% KI	M Pe	rcentile	Logn	ormal (z) 1.05						959	6 KM ι	JSL	(Log	normal))	1.478
1955																				_	
1957						Back	grou	ind DL/	2 Statistics A	ssuming	Logno	rmal D	istrib	ution							
1958					N	lean in (Origir	nal Sca	le 0.581							Me	ean i	in Lo	g Scale) -	0.622
1959						SD in (Origir	nal Sca	e 0.25								SD i	in Lo	g Scale	3	0.398
1960					95	% UTL9	5% C	Coverag	e 1.24								!	95%	UPL (t))	1.057
1961						90%	Perc	entile (z) 0.894							95	5% P	erce	ntile (z))	1.033
1962						99%	Perc	entile (z) 1.355									95	5% USL	-	1.694
1963			[DL/2 is	not a	Recorr	men	ded Me	thod. DL/2 p	rovided fo	or com	pariso	ns ar	d histo	orical r	eason	IS.				
1964																					
1965						N	lonpa	arametr	ic Distributio	n Free Ba	ckgro	und St	atisti	cs							
1966					Da	ita appe	ar to	follow	a Discernible	Distribut	ion at	5% Siç	gnific	ance L	.evel						
1967																					
1968			1	Nonpar	ramet	ric Upp	er Lir	nits for	BTVs(no dis	tinction m	ade b	etweer	n dete	ects ar	nd non	detects	s)				
1969						Orde	r of S	Statistic	r 42						95% l	JTL wit	th95°	% Cc	overage	3	1.4
1970			Appro	x, f use	d to c	compute	achi	eved C	C 2.211	Approx	kimate	Actual	Con	idence	e Coeff	icient a	achie	eved	by UTL	-	0.884
1971	Approxi	mate Samp	le Siz	e need	ed to	achieve	spec	cified C	C 59								-	95	5% UPL	-	1.185
1972							ç	95% US	L 1.4						95	% KM	Che	bysh	ev UPL	-	1.63
1973																					
1974									ative estimate												
1975		Therefo	re, on	e may ı					V only when							a set	free	of ou	ıtliers		
1976									vations colled												
1977									ance betwee												
1978		I	repres	ents a	back	ground o	data s	set and	when many o	onsite obs	ervatio	ns nee	ed to	oe com	npared	with th	וe B⊺	ΓV.			
1979																					
1980	TOLUENE	. (mg/)																			
1981																					
1982							0			l Statistic	S										
1983						mber of								Nur	nber o	t Missi	ng O	bser	vations	; 	0
1984				Numb	er of	Distinct										I			D - 4 4		4.4
1985					N.L			f Detec						N.L.					Detects Detects		44
1986					NUM	per of Di								INU	Imper						1
1987								m Dete m Dete											-Detec		1
1988								Detecte									-		Detects		1 00%
1989								Detecte								Feic			etectec		J0% I/A
1990				Mea	n of ^r	Detected									SD of	Detect			ed Data		1/A
1991				wed			LUY	yeu Da							00 01	Delec		June		· ^	
1992		\M/a	arning		sen/	ations a	re No	n-Dete	ects (NDs), th	erefore a	II statio	stics a	nd ee	timate	s shou	ild aler	o he	NDe	1		
1993			-						and other sta												
1994									site specific			-	- T							<u>v).</u>	
1995											Count				. puru		(-,	-, -, -,	- /*	
1996						The	data	set for	variable TOL	UENE (m	a/) wa	s not r	proce	ssed!							
1997											<i>.,</i>										
1998																					
1999 2000	TOTAL PH	IENOLICS	(ma/L)																	
2000				<u>, </u>																	

	A B C D E	F	G	Н			К	
2001			ų			Ŭ	IX.	Ľ
2002		General	Statistics					
2003	Total Number of Observations	45			Numbe	er of Missing Obs	ervations	0
2004	Number of Distinct Observations	2						
2005	Number of Detects	2				Number of Nor	n-Detects	43
2006	Number of Distinct Detects	1			Numb	per of Distinct Nor	n-Detects	2
2007	Minimum Detect	0.01				Minimum No	on-Detect	0.005
2008	Maximum Detect	0.01				Maximum No	on-Detect	0.01
2009	Variance Detected	0				Percent Nor	n-Detects	95.56%
2010	Mean Detected	0.01				SD	Detected	0
2011	Mean of Detected Logged Data	-4.605			SE	O of Detected Log	iged Data	0
2012								
2013	Warning: Only one distinct data value was detected	ed! ProUCL	(or any oth	er software) :	should not l	be used on such	a data set	ti.
2014	It is suggested to use alternative site specific values detern	nined by the	Project Te	eam to estima	ate environr	nental parameter	rs (e.g., E	PC, BTV).
2015								
2016	The data set for variable	TOTAL PHI	ENOLICS	(mg/L) was n	ot processe	d!		
2017								
2018								
2019	TRANS 1,2-DICHLOROETHENE (ug/L)							
2020								
2021		General	Statistics					
2022	Total Number of Observations	45			Numbe	er of Missing Obs	ervations	0
2023	Number of Distinct Observations	1						
2024	Number of Detects	0				Number of Nor	n-Detects	45
2025	Number of Distinct Detects	0			Numb	per of Distinct No	n-Detects	1
2026	Minimum Detect	N/A				Minimum No	on-Detect	1
2027	Maximum Detect	N/A				Maximum No	on-Detect	1
2028	Variance Detected	N/A				Percent Nor	n-Detects	100%
2029	Mean Detected	N/A				-	Detected	N/A
2030	Mean of Detected Logged Data	N/A			SE	D of Detected Log	ged Data	N/A
2031								
2032	Warning: All observations are Non-Detects							
2033	Specifically, sample mean, UCLs, UPLs, and					-		
2034	The Project Team may decide to use alternative si	te specific v	alues to e	stimate enviro	onmental pa	arameters (e.g., I	EPC, BTV).
2035								
2036	The data set for variable TRAN	IS 1,2-DICH	ILOROETH	HENE (ug/L)	was not pro	cessed!		
2037								
2038								
2039	TRICHLOROETHENE (ug/L)							
2040			04-4					
2041	T (1) (2)	General	Statistics					0
2042	Total Number of Observations	45			Numbe	er of Missing Obs	ervations	0
2043	Number of Distinct Observations	1				Number - f N	n Doto -t	45
2044	Number of Detects	0			K I	Number of Nor		45
2045	Number of Distinct Detects	0			Numb	per of Distinct Nor		1
2046	Minimum Detect	N/A				Minimum No		1
2047	Maximum Detect	N/A				Maximum No		1
2048	Variance Detected	N/A				Percent No		100%
2049	Mean Detected Mean of Detected Logged Data	N/A			01		Detected	N/A
2050	iviean or Detected Logged Data	N/A			51	D of Detected Log	iyeu Data	N/A

	A B C D E	F	G	Н	<u>г</u>	<u> </u>	J	<u> </u>	K	1	1
2051	A B C D E	Г	G	П	1		J		N		<u> </u>
2051	Warning: All observations are Non-Detect	s (NDs), the	erefore all st	atistics and e	estimates s	should a	lso be	NDs!			
2052	Specifically, sample mean, UCLs, UPLs, and	d other stati	stics are als	o NDs lying	below the	largest o	detecti	ion lin	nit!		
2053	The Project Team may decide to use alternative si	ite specific v	values to est	timate enviro	nmental p	aramete	rs (e.ç	<u>а., ЕР</u>	C, BTV	<i>'</i>).	
		-						-			
2055 2056	The data set for variable	TRICHLOR	OETHENE	(ug/L) was no	ot process	ed!					
2050				· · ·	-						
2058 2059	TURBIDITY (NTU)										
2059											
		General	Statistics								
2061 2062	Total Number of Observations	45			Numb	er of Mis	sing (Observ	vations	0	
	Number of Distinct Observations	29					U				
2063	Number of Detects	37				Num	ber of	Non-E	Detects	8	
2064	Number of Distinct Detects	28			Num	ber of Di	stinct	Non-E	Detects	1	
2065	Minimum Detect	0.11				Mi	nimum	n Non-	Detect	0	.1
2066	Maximum Detect	10.1				Ма	ximum	ו Non-	Detect	0	.1
2067	Variance Detected	3.434				Pe	ercent	Non-E	Detects		7.78%
2068	Mean Detected	0.826							etected		.853
2069	Mean of Detected Logged Data	-1.038			SI	D of Det		-			.05
2070					0.				a Data		
2071	Critical Values for	or Backarou	und Thresho	ld Values (B	TVs)						
2072	Tolerance Factor K (For UTL)	2.085			,		d2m	nax (fo	r USL)	2	.915
2073		2.000									
2074	Norm	al GOF Tes	st on Detects	s Only							
2075	Shapiro Wilk Test Statistic	0.405		, e.i.,	Shapiro V	Vilk GO	F Test	•			
2076	5% Shapiro Wilk Critical Value	0.936		Data No	t Normal a				vel		
2077	Lilliefors Test Statistic	0.401		Data He		s GOF					
2078	5% Lilliefors Critical Value	0.144		Data No	t Normal a			ncele	vel		
2079			5% Significa								
2080											
2081	Kaplan Meier (KM) Back	caround Sta	tistics Assu	ming Normal	Distributio	n					
2082	KM Mean	0.697			Distibutio				KM SD	1	.681
2083	95% UTL95% Coverage	4.201					95%		UPL (t)		.552
2084	90% KM Percentile (z)	2.851				95%			ntile (z)		.461
2085	99% KM Percentile (z)	4.607				507			M USL		.596
2086			<u> </u>								
2087	DL/2 Substitution Back	around Stat	istics Assun	ning Normal	Distributio	n					
2088	Mean	0.688							SD	1	.703
2089	95% UTL95% Coverage	4.239						95%	UPL (t)		.581
2090	90% Percentile (z)	2.87							ntile (z)		.489
2091	99% Percentile (z)	4.65							% USL		.653
2092	DL/2 is not a recommended meth		l ovided for co	omparisons a	and historic	al reaso	ons				
2093											
2094	Gamma GOF	Tests on D	etected Obs	ervations Or	lv						
2095	A-D Test Statistic	4.196			nderson-D	arling G	iOF T4	est			
2096	5% A-D Critical Value	0.792	Г	ata Not Gam		-			ncele	vel	
2097	K-S Test Statistic	0.277			Kolmogoro						
2098	5% K-S Critical Value	0.277	Г	ata Not Gam	-				ncele	vel	
2099	Data Not Gam						, , , , Oly	med			
2100			ou ut 070 Oli								

	A B C D	E	F	G	Тн				k	,	
2101				5		<u> </u>	0				
2102		Gamma	Statistics or	Detected	Data Only						
2103		k hat (MLE)	0.712				k star (bia	s cori	rected	MLE)	0.673
2104	The	ta hat (MLE)	1.16			The	eta star (bia	s cori	rected	MLE)	1.228
2105	r	nu hat (MLE)	52.71				nu sta	r (bia	s corre	cted)	49.77
2106	MLE Mean (bia	as corrected)	0.826								
2107	MLE Sd (bia	as corrected)	1.007			95% Per	centile of C	hisqu	uare (21	kstar)	4.645
2108				1							
2109		Gamma ROS		• •							
2110	GROS may not be used										
2111	GROS may not be used when kstar							all (e	e.g., <1	5-20)	
2112	For such situati						d BTVs				
2113		This is especia									
2114	For gamma distributed detected	1		y be comp	uted using ga	mma disti	ribution on k	KM es	stimate	S	
2115		Minimum	0.01							Mean	0.681
2116		Maximum	10.1						M	edian	0.23
2117		SD	1.706							CV	2.505
2118		k hat (MLE)	0.494				k star (bia			,	0.476
2119		ta hat (MLE)	1.378			The	eta star (bia			,	1.43
2120		nu hat (MLE)	44.48					•	s corre	,	42.85
2121	MLE Mean (bia		0.681				MLE So	•			0.987
2122	95% Percentile of Chisqu		3.722						% Perc		1.861
2123		% Percentile	2.662					99%	6 Perce	entile	4.64
2124	The following stat		•	-							
2125	Upper Limits	WH	HW	H) and Hav	wkins wixiey		tnoas		WF	1	HW
2126	95% Approx. Gamma UTL with 95% Coverage		3.255)E% Appr	ox. Gamma	וחו	2.2		2.265
2127	95% Gamma USL		6.442			5 % Apple	ox. Gamma	UFL	2.2	.75	2.205
2128		5.00	0.442								L
2129	F	stimates of G	amma Para	meters usir	na KM Estima	ates					
2130		Mean (KM)	0.697			100			SD	(KM)	1.681
2131	Vi	ariance (KM)	2.825					SF of	f Mean		0.254
2132		k hat (KM)	0.172						k star	. ,	0.175
2133		nu hat (KM)	15.47					r	nu star		15.78
2134	th	eta hat (KM)	4.053						eta star		3.976
2135	80% gamma per	· ,	0.85				90% gamm			` '	2.099
2136	95% gamma per	· · /	3.71				99% gamm	•		• •	8.247
2137		. ,					÷	•	-	. /	L
2138 2139	The following sta	atistics are c	omputed usi	ing gamma	distribution	and KM e	stimates				
2139 2140	Upper Limits		-								
2140		WH	HW		•				WF	1	HW
2141	95% Approx. Gamma UTL with 95% Coverage	2.802	2.69		ç	5% Appro	ox. Gamma	UPL	2.0	96	1.966
2142	95% KM Gamma Percentile	2.008	1.877			95	% Gamma	USL	4.8	324	4.907
2143		1		<u> </u>					I		L
2144	Lc	ognormal GO	F Test on D	etected Ob	servations C	Dnly					
2145	Shapiro Wilk 1	Fest Statistic	0.855			Shapiro	Wilk GOF	Test			
2140	5% Shapiro Wilk C	Critical Value	0.936		Data Not	Lognorm	al at 5% Sig	Inifica	ance Le	evel	
2148	Lilliefors 7	Test Statistic	0.143			Lillief	ors GOF Te	est			
2149	5% Lilliefors C	Critical Value	0.144	De	etected Data a	appear Lo	gnormal at	5% S	ignifica	ince L	evel
2150	Detected D	ata appear A	pproximate	Lognormal	at 5% Signi	ficance Le	vel				

	А	В			С	—	D		E	-	F	G		Н			1			J	┳	—	К	Т	-	
2151	~				0		D				I	ŭ								0			<u> </u>			
2152			Ba	ackg	round	i Log	normal	ROS	Statist	ics	Assuming I	_ognorm	nal Di	stributi	ion U	sing	Imp	uted	Nor	n-Dete	ect	s				
2153						Ν	lean in	Origii	nal Sca	ale	0.686									Mea	n in	I Lo	g Sca	ale	-1.4	54
2154							SD in	Origiı	nal Sca	le	1.704									SI	D in	I Lo	g Sca	ale	1.3	27
2155						95	% UTLS	5% C	Covera	ge	3.718						9	5% B	CA	UTL9) 5%	o Co	overa	ge	8.7	34
2156			95	5% B	lootsti	rap (%	6) UTLS	5% (Covera	ge	9.176										9	5%	UPL	(t)	2.2	27
2157							90%	Perc	entile ((z)	1.28									95%	Pe	erce	ntile	(z)	2.0	73
2158							99%	Perc	entile ((z)	5.121											95	5% U	SL	11.1	19
2159																										
2160					Sta	tistic	s using	KM e	stimat	es (on Logged [Data and	l Ass	uming	Logn	orma	al Di	stribu	utio	n						
2161						KM	Mean o	f Log	ged Da	ita	-1.262				95%	KM	UTL	. (Log	gnor	mal)9) 5%	S Cc	overa	ge	2.5	62
2162						K	M SD o	f Log	ged Da	ita	1.057							959	% K	M UP	۲ <u>۲</u> ۱	Logi	norm	al)	1.7	04
2163				9	5% KI	M Pe	rcentile	Logn	ormal ((z)	1.609							959	% K	MUS	iL (l	_ogi	norm	al)	6.1	61
2164																										
2165							Bac	kgrou	Ind DL	/2 5	Statistics As	suming	Logn	ormal	Distri	butio	n									
2166						N	lean in	Origii	nal Sca	ale	0.688									Mea	n in	I Lo	g Sca	ale	-1.38	86
2167							SD in	Origi	nal Sca	le	1.703									SI	D in	I Lo	g Sca	ale	1.2	15
						95	% UTLS	-			3.15												UPL		1.9	7
2168									entile (•	1.187									95%			ntile	• •	1.8	45
2169									entile (· ·	4.223												5% U	• •	8.6	38
2170				D	L/2 is	not a				· ·	od. DL/2 pro	ovided fo	or coi	nparis	ons a	nd hi	isto	ical I	reas	ons.						
2171																										
2172							N	lonpa	aramet	ric	Distribution	Free Ba	ockar	ound S	tatist	ics										
2173						Da		-			Discernible		-				e Le	vel								
2174																										
2175				N	onpar	rame	ric Upp	er Lir	mits fo	r B1	TVs(no disti	nction m	nade	betwee	en de	tects	and	non	det	ects)						
2176									Statistic		44									with9	95%	Cc	vera	ae	5.4	8
2177			Ap	prox.	. f use	ed to a	compute	achi	eved C) C	1.158	Approx	kimat	e Actua	al Cor	nfider									0.6	65
2178	Approxi	imate Sar		-							93												5% UI		4.8	
2179			1						95% US		10.1							95	5% k	(M Cł	heb	vsh	ev U	PL	8.1	
2180																			-	-		<i>,</i> -				
2181		Note:	The	use c	of USL	_ tenc	ls to vie	ld a c	onserv	ativ	ve estimate	of BTV.	espe	cially w	hen t	he sa	amp	e siz	e st	arts e	XCE	edi	na 2().		
2182											only when th												· ·			
2183											tions collect															
2184			Th	ne us	e of U						ce between								/ide	d the	dat	а				
2185											nen many on															
2186			- 4								,															
2187	VINYL CH	LORIDE	(uɑ/L	_)																						
2100																										
2189											General	Statistic	s													
2190					Tot	al Nu	mber of	Obs	ervatio	ns	45					N	Num	ber o	of Mi	ssing	l Ot	oser	vatio	ns	0	
2191							Distinct			-	1									.9				$\overline{+}$		
2192									f Detec	-	0							1	Num	nber o	of N	on-l	Deter	cts	45	
2193						Num	per of D				0						Nur			istinc					1	
2194									m Dete		N/A									inimu					1	
2195									m Dete		N/A									aximu					1	
2196									Detect		N/A									ercen					100%	6
2197									Detect		N/A								1	5.001			etect		N/A	
2198					Mea	n of ^r	Detected				N/A						(SD of	De	tected					N/A	
2199					wed			LUY	yeu Da	na	11/7							וט טכ	Ъе		. LU	, gge	Ju Da	ла	in/A	
2200																										

	А	В	С	D	E	F	G	Н	I	J	К	L
2201		Warn	ing: All obse	ervations are	Non-Detect	s (NDs), the	erefore all sta	atistics and e	estimates sh	ould also be	NDs!	
2202		Specific	cally, sample	e mean, UCL	.s, UPLs, an	d other stati	stics are also	o NDs lying	below the la	rgest detecti	on limit!	
2203	Т	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).										
2204												
2205				The data s	et for variab	e VINYL CH	ILORIDE (uç	g/L) was not	processed!			
2206												
2207												
2208	TOTAL XYL	ENES (ug/L	.)									
2209												
2210						General	Statistics					
2211			Total	Number of C	bservations	45			Number	of Missing C	Observations	0
2212			Number	of Distinct C	bservations	1						
2213				Numbe	er of Detects	0				Number of	Non-Detects	45
2214			N	umber of Dist	inct Detects	0			Numbe	er of Distinct	Non-Detects	1
2215				Mini	mum Detect	N/A				Minimum	Non-Detect	3
2216				Maxi	mum Detect	N/A				Maximum	Non-Detect	3
2217				Varian	ce Detected	N/A				Percent	Non-Detects	100%
2218				Me	an Detected	N/A				5	SD Detected	N/A
2219			Mean	of Detected L	ogged Data	N/A			SD	of Detected I	_ogged Data	N/A
2220												
2221									estimates sh			
2222									below the la	<u> </u>		
2223	Т	he Project T	'eam may de	cide to use	alternative s	ite specific v	alues to est	imate enviro	nmental par	ameters (e.g	I., EPC, BTV).
2224												
2225				The data s	et for variab	le TOTAL X	YLENES (ug	/L) was not	processed!			
2226												
2227												



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 03/18/2020

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:	ancaster County Solid Waste Manage						
Site Name: F	rey Farm Landfill						
Facility ID (as issued by DEP): 1	01389						
SEC	TION B. PRIVATE WATER SUPPLY INFORMATION						
INDICATE THE LATITUDE AND LONGIT	UDE TO THE NEAREST ONE TENTH OF A SECOND (DE° MM' SS.S")						
County: Lancaster C	ounty						
Township or Municipality: MANOR TC Landowner Name: LCSWMA Address: 3044 RIVER							
Phone No.:							
Sampling Point: Latitude: 39 °							
Depth to Water Level: Casing Stick Up:	ft. Measured from: X Land Surface TOC ft. Elevation of Water Level: ft./MSL						
Total Well Depth: Sampling Depth:	ftft Pumped Bailed						
Well Purged: Yes	X No Well Volumes Purged:						
Sample Field Filtered (must be 0.45 micro Sample Date:(mm/dd/yy) 02/2	on)?: X Yes No 1/2020 Sample Collection Time: 12:41 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 02/28/2020							
Were any holding times exceeded?:	Nere any holding times exceeded?: Yes X No If yes, please explain in comments field.						
Comments:							

Facility I.D. Number

101389

Monitoring Point I.D. No.

LCSWMA

PS

Sample Date

02/21/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.674	SM4500D
BICARBONATE ALKALINITY	8	SM20-2321
CALCIUM, TOTAL	14.2	EPA 200.7
CALCIUM, DISSOLVED	16	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	23.6	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	EPA 200.7
MAGNESIUM, DISSOLVED	12.5	EPA 200.7
MANGANESE, TOTAL (ug/l)	30	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	33	EPA 200.7
NITRATE-NITROGEN	19.3	EPA 300

Facility I.D. Number

101389

Monitoring Point I.D. No.

LCSWMA

PS

Sample Date

02/21/2020

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)	5.2	FIELD
pH-LAB (SU)	6.19	SM4500B
POTASSIUM, TOTAL	1.6	EPA 200.7
POTASSIUM, DISSOLVED	2	EPA 200.7
SODIUM, TOTAL	9.7	EPA 200.7
SODIUM, DISSOLVED	10.5	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	243	FIELD
SPEC. COND., LAB (umhos/cm)	223	EPA 120.1
SULFATE	2 ND	EPA 300
ALKALINITY	8	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	90	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

Facility I.D. Number

101389

Monitoring Point I.D. No.

LCSWMA

PS

Sample Date

02/21/2020

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



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 03/18/2020

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:	ancaster County Solid Waste Manage						
Site Name: F	rey Farm Landfill						
Facility ID (as issued by DEP): 1	01389						
SEC	TION B. PRIVATE WATER SUPPLY INFORMATION						
INDICATE THE LATITUDE AND LONGIT Facility Name:Frey Farm L	UDE TO THE NEAREST ONE TENTH OF A SECOND (DE° MM' SS.S")						
County: Lancaster C	ounty						
Township or Municipality: MANOR TO Landowner Name: MILLER Address: 3052 RIVER							
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:Sampling Depth:	ft. Sampling Method: Pumped Bailed						
Well Purged: Yes	X No Well Volumes Purged:						
Sample Field Filtered (must be 0.45 micro Sample Date:(mm/dd/yy) 02/2	on)?: X Yes No 1/2020 Sample Collection Time: 10:50 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 02/28/2020							
Were any holding times exceeded?:	Vere any holding times exceeded?: Yes X No If yes, please explain in comments field.						
Comments:							

Facility I.D. Number

101389

Monitoring Point I.D. No.

MILLER

PS

Sample Date

02/21/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.125	SM4500D
BICARBONATE ALKALINITY	8	SM20-2321
CALCIUM, TOTAL	17	EPA 200.7
CALCIUM, DISSOLVED	16.3	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	23.3	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	9.5	EPA 200.7
MAGNESIUM, DISSOLVED	9	EPA 200.7
MANGANESE, TOTAL (ug/l)	36	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	35	EPA 200.7
NITRATE-NITROGEN	18.3	EPA 300

Facility I.D. Number

101389

Monitoring Point I.D. No.

MILLER

PS

Sample Date

02/21/2020

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)	5.52	FIELD
pH-LAB (SU)	6.36	SM4500B
POTASSIUM, TOTAL	1.6	EPA 200.7
POTASSIUM, DISSOLVED	1.5	EPA 200.7
SODIUM, TOTAL	8.1	EPA 200.7
SODIUM, DISSOLVED	7.6	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	259	FIELD
SPEC. COND., LAB (umhos/cm)	222	EPA 120.1
SULFATE	2	EPA 300
ALKALINITY	8	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	106	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.19	SM 2130B

Facility I.D. Number

101389

Monitoring Point I.D. No.

MILLER

PS

Sample Date

02/21/2020

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



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 03/18/2020

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. S						
Applicant/permittee:	ancaster County Solid V	Waste Manage					
Site Name: F	rey Farm Landfill						
Facility ID (as issued by DEP): 1	01389						
SEC	TION B. PRIVATE WAT	TER SUPPLY INFORMATION					
		ONE TENTH OF A SECOND (DE° MM' SS.S")					
Facility Name: Frey Farm L							
County: Lancaster C							
Township or Municipality: MANOR TO	WNSHIP						
Landowner Name: LCSWMA							
Address: 3056 RIVER	R RUAD						
Phone No.:							
Sampling Point: Latitude: 39 o	57 28.44 .	Longitude: 76 º 26 ' <u>10.43</u> "					
Depth to Water Level:		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 micro	on)?: X Yes N	0					
Sample Date:(mm/dd/yy) 02/2	5/2020	Sample Collection Time: 5:38 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	03/04/2020						
Were any holding times exceeded?:	Yes X No If yes,	, please explain in comments field.					
Comments:	Comments:						

Facility I.D. Number

101389

Monitoring Point I.D. No.

LCSWMA

PS

Sample Date

02/25/2020

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	10.9	EPA 200.7
CALCIUM, DISSOLVED	11.3	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	25.4	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	12.1	EPA 200.7
MAGNESIUM, DISSOLVED	12.2	EPA 200.7
MANGANESE, TOTAL (ug/l)	71	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	72	EPA 200.7
NITRATE-NITROGEN	18.8	EPA 300

Facility I.D. Number

101389

Monitoring Point I.D. No.

LCSWMA

PS

Sample Date

02/25/2020

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)	5.61	FIELD
pH-LAB (SU)	5.4	SM4500B
POTASSIUM, TOTAL	1.6	EPA 200.7
POTASSIUM, DISSOLVED	3.4	EPA 200.7
SODIUM, TOTAL	7.6	EPA 200.7
SODIUM, DISSOLVED	8.1	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	271	FIELD
SPEC. COND., LAB (umhos/cm)	237	EPA 120.1
SULFATE	2 ND	EPA 300
ALKALINITY	5 ND	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	152	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

Facility I.D. Number

101389

Monitoring Point I.D. No.

LCSWMA

PS

Sample Date

02/25/2020

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



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 03/18/2020

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:	ancaster County Solid Waste Manage		
Site Name: F	rey Farm Landfill		
Facility ID (as issued by DEP): 1	01389		
SEC	TION B. PRIVATE WATER SUPPLY INFORMATION		
	UDE TO THE NEAREST ONE TENTH OF A SECOND (DE° MM' SS.S")		
Facility Name: Frey Farm L			
County: Lancaster C	<u>-</u>		
Township or Municipality: MANOR TO	WNSHIP		
Landowner Name: LCSWMA			
Address: 3060 RIVEF	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	тос	
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 micro	on)?: X Yes No		
Sample Date:(mm/dd/yy) 02/2	5/2020 Sample Collection Time: 5:47 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	03/04/2020		
Were any holding times exceeded?:	Yes X No If yes, please explain in comments field.		
Comments:			

Facility I.D. Number

101389

Monitoring Point I.D. No.

LCSWMA

PS

Sample Date

02/25/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	13	SM20-2321
CALCIUM, TOTAL	9.4	EPA 200.7
CALCIUM, DISSOLVED	10.7	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	22.3	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	39	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	10.1	EPA 200.7
MAGNESIUM, DISSOLVED	10.8	EPA 200.7
MANGANESE, TOTAL (ug/l)	110	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	100	EPA 200.7
NITRATE-NITROGEN	15.3	EPA 300

Facility I.D. Number

101389

Monitoring Point I.D. No.

LCSWMA

PS

Sample Date

02/25/2020

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)	5.58	FIELD
pH-LAB (SU)	5.89	SM4500B
POTASSIUM, TOTAL	2	EPA 200.7
POTASSIUM, DISSOLVED	4.1	EPA 200.7
SODIUM, TOTAL	7.2	EPA 200.7
SODIUM, DISSOLVED	8.3	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	348	FIELD
SPEC. COND., LAB (umhos/cm)	229	EPA 120.1
SULFATE	10.6	EPA 300
ALKALINITY	13	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	130	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	1.78	SM 2130B

Facility I.D. Number

101389

Monitoring Point I.D. No.

LCSWMA

PS

Sample Date

02/25/2020

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



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 03/18/2020

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 1	103		
SECTION A. SITE IDENTIFIER			
Applicant/permittee: La	ncaster County Solid	Waste Manage	
Site Name: Fre	ey Farm Landfill		
Facility ID (as issued by DEP): 10	1389		
SECT	ION B. PRIVATE W	ATER SUPPLY INFORMATION	
INDICATE THE LATITUDE AND LONGITU Facility Name:Frey Farm La		T ONE TENTH OF A SECOND (DE° MM' SS.S")	
County: Lancaster Co	unty		
Township or Municipality:MANOR TOWLandowner Name:SENSENICHAddress:3076 RIVER			
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: Sampling Depth:	ft ft.	Sampling Method: Pumped Bailed	
Well Purged: Yes	X No	Well Volumes Purged:	
Sample Field Filtered (must be 0.45 micror Sample Date:(mm/dd/yy) 02/21		No Sample Collection Time: 10:36 AM	
Laboratory(ies) Performing Analysis	ALS Environmental		
- (include address and phone number)	34 Dogwood Lane		
	Middletown, PA 1705	7 (717) 944-5541	
Lab Accreditation Number(s)	22-293		
Lab Analysis Date	02/28/2020		
Were any holding times exceeded?:	Yes <u>X</u> No If ye	es, please explain in comments field.	
Comments:			

Facility I.D. Number

101389

Monitoring Point I.D. No.

SENSENICH

PS

Sample Date

02/21/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.108	SM4500D
BICARBONATE ALKALINITY	10	SM20-2321
CALCIUM, TOTAL	14	EPA 200.7
CALCIUM, DISSOLVED	16	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	48.5	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	8.5	EPA 200.7
MAGNESIUM, DISSOLVED	9.3	EPA 200.7
MANGANESE, TOTAL (ug/l)	160	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	180	EPA 200.7
NITRATE-NITROGEN	10.1	EPA 300

Facility I.D. Number

101389

Monitoring Point I.D. No.

SENSENICH

PS

Sample Date

02/21/2020

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)	5.65	FIELD
pH-LAB (SU)	6.35	SM4500B
POTASSIUM, TOTAL	3.1	EPA 200.7
POTASSIUM, DISSOLVED	3.5	EPA 200.7
SODIUM, TOTAL	24.1	EPA 200.7
SODIUM, DISSOLVED	25.3	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	324	FIELD
SPEC. COND., LAB (umhos/cm)	278	EPA 120.1
SULFATE	12.7	EPA 300
ALKALINITY	10	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	202	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.25	SM 2130B

Facility I.D. Number

101389

Monitoring Point I.D. No.

PS SENSENICH

Sample Date

02/21/2020

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



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 03/18/2020

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:	ancaster County Solid Waste Manage		
Site Name: F	rey Farm Landfill		
Facility ID (as issued by DEP): 1	01389		
SEC	TION B. PRIVATE WATER SUPPLY INFORMATION		
INDICATE THE LATITUDE AND LONGI	FUDE TO THE NEAREST ONE TENTH OF A SECOND (DE° $$ MM' SS.S")		
Facility Name: Frey Farm L	andfill		
County: Lancaster C	ounty		
Township or Municipality: MANOR TC	WNSHIP		
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 micro	on)?: X Yes No		
Sample Date:(mm/dd/yy) 02/2	1/2020 Sample Collection Time: 1:00 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	02/28/2020		
Were any holding times exceeded?:	Yes X No If yes, please explain in comments field.		
Comments:			

Facility I.D. Number

101389

Monitoring Point I.D. No.

LCSWMA

PS

Sample Date

02/21/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.101	SM4500D
BICARBONATE ALKALINITY	36	SM20-2321
CALCIUM, TOTAL	9.2	EPA 200.7
CALCIUM, DISSOLVED	10.6	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	33.4	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	5.2	EPA 200.7
MAGNESIUM, DISSOLVED	6	EPA 200.7
MANGANESE, TOTAL (ug/I)	150	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	160	EPA 200.7
NITRATE-NITROGEN	0.2 ND	EPA 300

Facility I.D. Number

101389

Monitoring Point I.D. No.

LCSWMA

PS

Sample Date

02/21/2020

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)	5.73	FIELD
pH-LAB (SU)	6.9	SM4500B
POTASSIUM, TOTAL	1.6	EPA 200.7
POTASSIUM, DISSOLVED	1.7	EPA 200.7
SODIUM, TOTAL	14	EPA 200.7
SODIUM, DISSOLVED	14	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	211	FIELD
SPEC. COND., LAB (umhos/cm)	187	EPA 120.1
SULFATE	11.9	EPA 300
ALKALINITY	36	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	56	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

Facility I.D. Number

101389

Monitoring Point I.D. No.

LCSWMA

PS

Sample Date

02/21/2020

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



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 03/18/2020

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. Well Purged: Yes Well Volumes Purged:			
Sample Field Filtered (must be 0.45 micron)?: X Yes No Sample Date:(mm/dd/yy) 02/21/2020 Sample Collection Time: 1:18 PM			
Laboratory(ies) Performing Analysis ALS Environmental			
(include address and phone number) <u>34 Dogwood Lane</u>			
Middletown, PA 17057 (717) 944-5541			
Lab Accreditation Number(s) 22-293			
Lab Analysis Date 02/28/2020			
Were any holding times exceeded?:Yes XNo If yes, please explain in comments field.			
Comments:			

Facility I.D. Number

101389

Monitoring Point I.D. No.

WEBER

PS

Sample Date

02/21/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	152	SM20-2321
CALCIUM, TOTAL	0.1	EPA 200.7
CALCIUM, DISSOLVED	0.3	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	243	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	0.062	EPA 200.7
MAGNESIUM, DISSOLVED	0.12	EPA 200.7
MANGANESE, TOTAL (ug/l)	2.5 ND	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	5 ND	EPA 200.7
NITRATE-NITROGEN	6.6	EPA 300

Facility I.D. Number

101389

Monitoring Point I.D. No.

WEBER

PS

Sample Date

02/21/2020

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)	6.54	FIELD
pH-LAB (SU)	7.75	SM4500B
POTASSIUM, TOTAL	2.5	EPA 200.7
POTASSIUM, DISSOLVED	2.6	EPA 200.7
SODIUM, TOTAL	255	EPA 200.7
SODIUM, DISSOLVED	224	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	1076	FIELD
SPEC. COND., LAB (umhos/cm)	1090	EPA 120.1
SULFATE	2 ND	EPA 300
ALKALINITY	152	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	502	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

Facility I.D. Number

101389

Monitoring Point I.D. No.

WEBER

PS

Sample Date

02/21/2020

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



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 03/18/2020

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.

SECTION A. SITE IDENTIFIER Applicant/permittee: Lancaster County Solid Waste Manage Site Name: Frey Farm Landfill
· FFreeware · · · · ·
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
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. Well Purged: Yes X No Well Volumes Purged:
Sample Field Filtered (must be 0.45 micron)?: X Yes No Sample Date:(mm/dd/yy) 02/21/2020 Sample Collection Time: 9:39 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 02/28/2020
Were any holding times exceeded?: Yes X No If yes, please explain in comments field.
Comments:

Facility I.D. Number

101389

Monitoring Point I.D. No.

KIRCHNER

PS

Sample Date

02/21/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.104	SM4500D
BICARBONATE ALKALINITY	15	SM20-2321
CALCIUM, TOTAL	20.1	EPA 200.7
CALCIUM, DISSOLVED	18.9	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	50.8	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	7.6	EPA 200.7
MAGNESIUM, DISSOLVED	7.2	EPA 200.7
MANGANESE, TOTAL (ug/l)	9	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	8.8	EPA 200.7
NITRATE-NITROGEN	4.2	EPA 300

Facility I.D. Number

101389

Monitoring Point I.D. No.

KIRCHNER

PS

Sample Date

02/21/2020

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)	5.18	FIELD
pH-LAB (SU)	6.48	SM4500B
POTASSIUM, TOTAL	1.3	EPA 200.7
POTASSIUM, DISSOLVED	1.1	EPA 200.7
SODIUM, TOTAL	18.5	EPA 200.7
SODIUM, DISSOLVED	16.7	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	268	FIELD
SPEC. COND., LAB (umhos/cm)	253	EPA 120.1
SULFATE	10.7	EPA 300
ALKALINITY	15	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	162	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

Facility I.D. Number

101389

Monitoring Point I.D. No.

KIRCHNER

PS

Sample Date

02/21/2020

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



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 03/18/2020

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:	ancaster County Solid Waste Manage		
Site Name: F	Frey Farm Landfill		
Facility ID (as issued by DEP): 1	01389		
SEC	TION B. PRIVATE WATER SUPPLY INFORMATION		
INDICATE THE LATITUDE AND LONGI	TUDE TO THE NEAREST ONE TENTH OF A SECOND (DE° MM' SS.S")		
Facility Name:Frey Farm L	.andfill		
County: Lancaster C	ounty		
Township or Municipality: MANOR TO	WNSHIP		
Landowner Name:FRY			
Address: 3106 RIVER	ROAD		
Phone No.:			
Sampling Point: Latitude: 39 °	57 ' 17.27 ["] Longitude: 76 ° 26 ' <u>5.6 "</u>		
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 micro	on)?: X Yes No		
Sample Date:(mm/dd/yy) 02/2	21/2020 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	02/28/2020		
Were any holding times exceeded?:	Yes X_{No} If yes, please explain in comments field.		
Comments:			

Facility I.D. Number

101389

PS

Monitoring Point I.D. No.

FRY

Sample Date

02/21/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.127	SM4500D
BICARBONATE ALKALINITY	16	SM20-2321
CALCIUM, TOTAL	24.4	EPA 200.7
CALCIUM, DISSOLVED	18	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	122	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	61	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	16.2	EPA 200.7
MAGNESIUM, DISSOLVED	6.8	EPA 200.7
MANGANESE, TOTAL (ug/l)	47	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	8.1	EPA 200.7
NITRATE-NITROGEN	14.2	EPA 300

Facility I.D. Number

101389

Monitoring Point I.D. No.

FRY

PS

Sample Date

02/21/2020

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)	5.28	FIELD
pH-LAB (SU)	6.54	SM4500B
POTASSIUM, TOTAL	2.1	EPA 200.7
POTASSIUM, DISSOLVED	0.92	EPA 200.7
SODIUM, TOTAL	58	EPA 200.7
SODIUM, DISSOLVED	16.4	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	553	FIELD
SPEC. COND., LAB (umhos/cm)	537	EPA 120.1
SULFATE	6.2	EPA 300
ALKALINITY	16	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	304	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	1.12	SM 2130B

Facility I.D. Number

101389

Monitoring Point I.D. No.

FRY

PS

Sample Date

02/21/2020

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 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			



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised 03/18/2020

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:	ancaster County Solid Waste Manage								
Site Name: F	Frey Farm Landfill								
Facility ID (as issued by DEP): 1	Facility ID (as issued by DEP): 101389								
SECTION B. PRIVATE WATER SUPPLY INFORMATION									
INDICATE THE LATITUDE AND LONGI	TUDE TO THE NEAREST ONE TENTH OF A SECOND (DE° $$ MM' SS.S")								
Facility Name: Frey Farm L	andfill								
County: Lancaster C	County								
Township or Municipality: MANOR TO	WNSHIP								
Landowner Name:BECK									
Address: 3125 RIVER	ROAD								
Phone No.:									
Sampling Point: Latitude: 39 o	2 57 <u>11.6</u> Longitude: <u>76</u> 26 <u>5.4</u>								
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 micro	on)?: X Yes No								
Sample Date:(mm/dd/yy) 02/2	21/2020 Sample Collection Time: 12:00 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 02/28/2020									
Were any holding times exceeded?:	Yes X No If yes, please explain in comments field.								
Comments:									

Facility I.D. Number

101389

PS

Monitoring Point I.D. No.

BECK

Sample Date

02/21/2020

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

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	167	SM20-2321
CALCIUM, TOTAL	19.5	EPA 200.7
CALCIUM, DISSOLVED	15	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	120	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	2.7	EPA 200.7
MAGNESIUM, DISSOLVED	3	EPA 200.7
MANGANESE, TOTAL (ug/l)	15	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	14	EPA 200.7
NITRATE-NITROGEN	5.9	EPA 300

Facility I.D. Number

101389

Monitoring Point I.D. No.

BECK

PS

Sample Date

02/21/2020

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)	6.59	FIELD
pH-LAB (SU)	7.84	SM4500B
POTASSIUM, TOTAL	36.9	EPA 200.7
POTASSIUM, DISSOLVED	24.6	EPA 200.7
SODIUM, TOTAL	133	EPA 200.7
SODIUM, DISSOLVED	117	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	763	FIELD
SPEC. COND., LAB (umhos/cm)	757	EPA 120.1
SULFATE	16.6	EPA 300
ALKALINITY	167	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	420	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.66	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.1 ND	SM 2130B

Facility I.D. Number

101389

Monitoring Point I.D. No.

BECK

PS

Sample Date

02/21/2020

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 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			





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

March 5, 2020

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

Certificate of Analysis

Revised Report - 3/5/2020 5:37:03 PM - See workorder comment section for explanation

Project Name:	CONTIGUOUS LANDOWNER- 3044 RIVER RD	Workorder:	3088006
Purchase Order:	PO1000126	Workorder ID:	1ST QTR 2020-3044 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, February 21, 2020.

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

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

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

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

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

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

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

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America

Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay. Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey





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: 3088006 1ST QTR 2020-3044 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3088006001	3044 River Road, Conestoga, PA	Water	2/21/2020 12:41	2/21/2020 15:43	Mr. Brian G Shade

ALS Environmental Laboratory Locations Across North America

Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay. Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey





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: 3088006 1ST QTR 2020-3044 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

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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

PROJECT SUMMARY

Workorder: 3088006 1ST QTR 2020-3044 RIVER RD

Workorder Comments

This certificate of analysis was modified to include the analytical results section based on the email from Dan Brown on 03/03/2020. SJS 03/05/2020

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ANALYTICAL RESULTS

Workorder: 3088006 1ST QTR 2020-3044 RIVER RD

Lab ID: 3088006001 Sample ID: 3044 River Ro	ad, Conest	oga, PA	\			2/21/2020 12:- 2/21/2020 15:-		Matrix: V	Vater	
Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
WET CHEMISTRY										
Alkalinity, Bicarbonate	8		mg/L	5	SM2320B-2011			2/25/20 20:24	MBW	С
Alkalinity, Total	8	1	mg/L	5	SM2320B-2011			2/25/20 20:24	MBW	С
Ammonia-N	0.674		mg/L	0.100	ASTM D6919-09			2/28/20 06:48	JWB	В
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			2/27/20 01:30	JAM	В
Chloride	23.6		mg/L	2.0	EPA 300.0			2/22/20 11:44	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			2/22/20 11:44	MBW	С
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			2/25/20 14:36	PAG	I
Nitrate-N	19.3		mg/L	0.20	EPA 300.0			2/22/20 11:44	MBW	С
Nitrite-N	ND		mg/L	0.20	EPA 300.0			2/22/20 11:44	MBW	С
рН	6.19	2	pH_Units		S4500HB-11			2/25/20 20:24	MBW	С
Phenolics	ND		mg/L	0.005	EPA 420.4	2/24/20 09:41	C_D	2/26/20 05:48	C_D	Н
Specific Conductance	223		umhos/cm	1	SM2510B-2011			2/25/20 20:24	MBW	С
Sulfate	ND		mg/L	2.0	EPA 300.0			2/22/20 11:44	MBW	С
Total Dissolved Solids	90		mg/L	25	S2540C-11			2/26/20 15:51	D1C	С
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			2/25/20 04:59	PAG	F
Turbidity	ND		NTU	0.10	SM2130B-2011			2/22/20 07:38	R2B	С
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			2/26/20 14:47	DPC	К
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 14:47	DPC	К
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 14:47	DPC	К
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 14:47	DPC	К
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 14:47		К
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 14:47		К
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/26/20 14:47		К
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/26/20 14:47	DPC	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 14:47	DPC	ĸ
Toluene	ND		ug/L	1.0	SW846 8260B			2/26/20 14:47		ĸ
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/26/20 14:47	DPC	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 14:47		K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 14:47	DPC	K
Trichlorofluoromethane			ug/L	1.0	SW846 8260B			2/26/20 14:47	DPC	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B	- <i>.</i>	-	2/26/20 14:47		K
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	108		%	62 - 133	SW846 8260B			2/26/20 14:47	DPC	К

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ANALYTICAL RESULTS

Workorder: 3088006 1ST QTR 2020-3044 RIVER RD

Lab ID: 3088006001 Sample ID: 3044 River Ro	ad, Conestoga,	PA			2/21/2020 12:41 2/21/2020 15:43	Matrix: V	/ater
Parameters	Results Fla	g Units	RDL	Method	Prepared By	Analyzed	By Cntr
4-Bromofluorobenzene (S)	107	%	79 - 114	SW846 8260B		2/26/20 14:47	DPC K
Dibromofluoromethane (S)	97.6	%	78 - 116	SW846 8260B		2/26/20 14:47	DPC K
Toluene-d8 (S)	102	%	76 - 127	SW846 8260B		2/26/20 14:47	DPC K
METALS							
Calcium, Total	14.2	mg/L	0.050	EPA 200.7	2/25/20 16:14 SXC	2/26/20 14:25	MNP D1
Calcium, Dissolved	16.0	mg/L	0.10	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:17	MNP E
Iron, Total	ND	mg/L	0.030	EPA 200.7	2/25/20 16:14 SXC	2/26/20 14:25	MNP D1
Iron, Dissolved	ND	mg/L	0.060	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:17	MNP E
Magnesium, Total	11.0	mg/L	0.050	EPA 200.7	2/25/20 16:14 SXC	2/26/20 14:25	MNP D1
Magnesium, Dissolved	12.5	mg/L	0.10	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:17	MNP E
Manganese, Total	0.030	mg/L	0.0025	EPA 200.7	2/25/20 16:14 SXC	2/26/20 14:25	MNP D1
Manganese, Dissolved	0.033	mg/L	0.0050	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:17	MNP E
Potassium, Total	1.6	mg/L	0.25	EPA 200.7	2/25/20 16:14 SXC	2/26/20 14:25	MNP D1
Potassium, Dissolved	2.0	mg/L	0.50	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:17	MNP E
Sodium, Total	9.7	mg/L	0.25	EPA 200.7	2/25/20 16:14 SXC	2/26/20 14:25	MNP D1
Sodium, Dissolved	10.5	mg/L	0.50	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:17	MNP E
FIELD PARAMETERS							
pH, Field (SM4500B)	5.20	pH_Units		Field		2/21/20 12:41	BGS N
Specific Conductance, Field	243	umhos/cm	1	Field		2/21/20 12:41	BGS N
Temperature	13.20	Deg. C		Field		2/21/20 12:41	BGS N

Susand. Schare

Ms. Susan J Scherer Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3088006 1ST QTR 2020-3044 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3088006001	1	3044 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity i	s titrate	ed to a pH of 4.5 and reported as mg 0	CaCO3/L.	
3088006001	2	3044 River Road, Conestoga, PA	S4500HB-11	рН
The pH analysis is a	an "ana	lyze immediately" analysis. Paramete	rs 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 Laboratory Locations Across North America





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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3088006 1ST QTR 2020-3044 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3088006001	3044 River Road, Conestoga, PA	ASTM D6919-09	
3088006001	3044 River Road, Conestoga, PA	EPA 200.7	EPA ACID
3088006001	3044 River Road, Conestoga, PA	EPA 200.7	EPA TRMD
3088006001	3044 River Road, Conestoga, PA	EPA 300.0	
3088006001	3044 River Road, Conestoga, PA	EPA 410.4	
3088006001	3044 River Road, Conestoga, PA	EPA 420.4	420.4/9066
3088006001	3044 River Road, Conestoga, PA	Field	
3088006001	3044 River Road, Conestoga, PA	S2540C-11	
3088006001	3044 River Road, Conestoga, PA	S4500HB-11	
3088006001	3044 River Road, Conestoga, PA	SM2130B-2011	
3088006001	3044 River Road, Conestoga, PA	SM2320B-2011	
3088006001	3044 River Road, Conestoga, PA	SM2510B-2011	
3088006001	3044 River Road, Conestoga, PA	SM5310B-2011	
3088006001	3044 River Road, Conestoga, PA	SW846 8260B	
3088006001	3044 River Road, Conestoga, PA	SW846 9020B	

ALS Environmental Laboratory Locations Across North America

Optimize Activity Activity Activity Control Table Control	stagementure subdementationis etem 173445141 - Fastrikationis exercitationis exercitationis 301 Futuring Mail Road & Maddietowin, PA 12057 + 717,244,5541 + Fastr 717,344,1430	TITELESS + 117,944,5541 + F8	X: 717.944.143		ALL SHAL	SAMPLE	SED AREAS MUST BE COMPLETED BY SAMPLER. INSTRUCTIONS ON THE BA	T BE CO	DED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.	D BY TH	CLIEN		= r	• 3 0 8	* * * *	
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Theread FIL FILSION FI	Idress: 1299 Harrisburg Pike, P.O.	Box 4424		Container	40 ml	125 ml	250 ml	40 ml	Ĭ	-	_	-	-	-	H Them (D:	107
AMM.YESS/INCTHOD REQUESTED AMM.YESS/INCTHOD REQUESTED Constraint Constraint 6.0. Guidefie/ Color for Solid Yester MA 0.0. Guidefie/ MA 0.0. Guidefie/ MA MALYSES/INCTHOD REQUESTED Constraints Reverse in kin Color for Solid Yester MA Approved By: Approved By: Approv	Lancaster, PA 17604			Preservative	104	H2SO4	H2SO4	P	ĩ	-	-		-	No. of Coc	lens:	N Initial
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Material C:C: C:C:<:C: C:C:<:C: C:C:	3044RIVERRD	UCITOICU	-	_	0	196	~	100		+	1			,		
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301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944 5541

Condition of Sample Receipt Form

F: (717) 944-1430

I. Were airbills / tracking numbers present and recorded? Tracking number:		YES	N
2. Are Custody Seals on shipping containers intact?	NONE	YES	N
3. Are Custody Seals on sample containers intact?		YES	NO
I. Is there a COC (Chain-of-Custody) present?		(YES)	NO
. Are the COC and bottle labels complete, legible and in agreement?		MESS	NO
Sa. Does the COC contain sample locations?		(YES)	NC
5b. Does the COC contain date and time of sample collection for all samples?		TES	NC
Sc. Does the COC contain sample collectors name?		YES	NC
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?	energeneinen.	(YES)	NC
Sf. Does the COC note the type of sample, composite or grab?			NC
5g. Does the COC note the matrix of the sample(s)?		(YES)	NC
Are all aqueous samples requiring preservation preserved correctly?		TES	NO
. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
Are all samples within holding times for the requested analyses?			CNO
. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, el		YES	NO
0. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	MTA	YES	NO
1. Were the samples received on ice?			NO
2. Were sample temperatures measured at 0.0-6.0°C			NO
3. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(YES)	NO
1 3a. Are the samples required for SDWA compliance reporting?	Contraction and the second second	YES	NB
13b. Did the client provide a SDWA PWS (D#?	NTA)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?		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)?		YES	NO
Cooler #:			
Temperature (°C): 4			
Thermometer ID: 407	_		
Radiological (µCi):			

.







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

March 2, 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:	3088004
Purchase Order:	PO1000126	Workorder ID:	1ST QTR 2020-3052 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, February 21, 2020.

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

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

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

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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.

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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: 3088004 1ST QTR 2020-3052 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3088004001	3052 River Road, Conestoga, PA	Water	2/21/2020 10:50	2/21/2020 15:43	Mr. Brian G Shade

ALS Environmental Laboratory Locations Across North America





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: 3088004 1ST QTR 2020-3052 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

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ANALYTICAL RESULTS

Workorder: 3088004 1ST QTR 2020-3052 RIVER RD

Lab ID: 3088004001 Sample ID: 3052 River Ro	ad, Conest	oga, PA	ι.		Date Collected: Date Received:			Matrix: V	Vater	
Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
WET CHEMISTRY										
Alkalinity, Bicarbonate	8		mg/L	5	SM2320B-2011			2/25/20 20:24	MBW	С
Alkalinity, Total	8	1	mg/L	5	SM2320B-2011			2/25/20 20:24	MBW	С
Ammonia-N	0.125		mg/L	0.100	ASTM D6919-09			2/28/20 04:03	JWB	В
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			2/27/20 01:30	JAM	В
Chloride	23.3		mg/L	2.0	EPA 300.0			2/22/20 11:10	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			2/22/20 11:10	MBW	С
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			2/25/20 13:07	PAG	I
Nitrate-N	18.3		mg/L	0.20	EPA 300.0			2/22/20 11:10	MBW	С
Nitrite-N	ND		mg/L	0.20	EPA 300.0			2/22/20 11:10	MBW	С
рН	6.36	2	pH_Units		S4500HB-11			2/25/20 20:24	MBW	С
Phenolics	ND		mg/L	0.005	EPA 420.4	2/24/20 09:41	C_D	2/26/20 05:48	C_D	Н
Specific Conductance	222		umhos/cm	1	SM2510B-2011			2/25/20 20:24	MBW	С
Sulfate	2.0		mg/L	2.0	EPA 300.0			2/22/20 11:10	MBW	С
Total Dissolved Solids	106	3	mg/L	25	S2540C-11			2/26/20 15:51	D1C	С
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			2/25/20 04:59	PAG	F
Turbidity	0.19		NTU	0.10	SM2130B-2011			2/22/20 07:38	R2B	С
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:10	PDK	К
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 01:10	PDK	К
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 01:10	PDK	К
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:10	PDK	К
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:10	PDK	К
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:10	PDK	К
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:10	PDK	К
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/26/20 01:10		К
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:10	PDK	K
Toluene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:10	PDK	К
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/26/20 01:10	PDK	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 01:10		K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:10	PDK	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			2/26/20 01:10	PDK	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/26/20 01:10	PDK	К
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	113		%	62 - 133	SW846 8260B			2/26/20 01:10	PDK	К

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ANALYTICAL RESULTS

Workorder: 3088004 1ST QTR 2020-3052 RIVER RD

Lab ID: 3088004001 Sample ID: 3052 River Ro	ad, Conestoga, I	ΡΑ			2/21/2020 10:50 2/21/2020 15:43	Matrix: W	/ater	
Parameters	Results Flag	g Units	RDL	Method	Prepared By	Analyzed	Ву	Cntr
4-Bromofluorobenzene (S)	112	%	79 - 114	SW846 8260B		2/26/20 01:10	PDK	К
Dibromofluoromethane (S)	105	%	78 - 116	SW846 8260B		2/26/20 01:10	PDK	К
Toluene-d8 (S)	110	%	76 - 127	SW846 8260B		2/26/20 01:10	PDK	К
METALS								
Calcium, Total	17.0	mg/L	0.050	EPA 200.7	2/25/20 16:14 SXC	2/26/20 14:15	MNP	D1
Calcium, Dissolved	16.3	mg/L	0.10	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:04	MNP	E
Iron, Total	ND	mg/L	0.030	EPA 200.7	2/25/20 16:14 SXC	2/26/20 14:15	MNP	D1
Iron, Dissolved	ND	mg/L	0.060	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:04	MNP	E
Magnesium, Total	9.5	mg/L	0.050	EPA 200.7	2/25/20 16:14 SXC	2/26/20 14:15	MNP	D1
Magnesium, Dissolved	9.0	mg/L	0.10	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:04	MNP	E
Manganese, Total	0.036	mg/L	0.0025	EPA 200.7	2/25/20 16:14 SXC	2/26/20 14:15	MNP	D1
Manganese, Dissolved	0.035	mg/L	0.0050	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:04	MNP	E
Potassium, Total	1.6	mg/L	0.25	EPA 200.7	2/25/20 16:14 SXC	2/26/20 14:15	MNP	D1
Potassium, Dissolved	1.5	mg/L	0.50	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:04	MNP	E
Sodium, Total	8.1	mg/L	0.25	EPA 200.7	2/25/20 16:14 SXC	2/26/20 14:15	MNP	D1
Sodium, Dissolved	7.6	mg/L	0.50	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:04	MNP	E
FIELD PARAMETERS								
pH, Field (SM4500B)	5.52	pH_Units		Field		2/21/20 10:50	BGS	Ν
Specific Conductance, Field	259	umhos/cm	1	Field		2/21/20 10:50	BGS	Ν
Temperature	13.30	Deg. C		Field		2/21/20 10:50	BGS	Ν

Susand. Schare

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





Total Dissolved Solids

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

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ANALYTICAL RESULTS

Workorder: 3088004 1ST QTR 2020-3052 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3088004001	1	3052 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity	is titrate	ed to a pH of 4.5 and reported as mg (CaCO3/L.	
3088004001	2	3052 River Road, Conestoga, PA	S4500HB-11	pH
			rs identified as "analyze immediately" ding time when analyzed in the labora	require analysis within 15 minutes of tory.

3088004001 3 3052 River Road, Conestoga, PA S2540C-11

The QC sample type DUP for method S2540C-11 was outside the control limits for the analyte Total Dissolved Solids. The RPD was reported as 131 and the upper control limit is 5.

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3088004 1ST QTR 2020-3052 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3088004001	3052 River Road, Conestoga, PA	ASTM D6919-09	
3088004001	3052 River Road, Conestoga, PA	EPA 200.7	EPA ACID
3088004001	3052 River Road, Conestoga, PA	EPA 200.7	EPA TRMD
3088004001	3052 River Road, Conestoga, PA	EPA 300.0	
3088004001	3052 River Road, Conestoga, PA	EPA 410.4	
3088004001	3052 River Road, Conestoga, PA	EPA 420.4	420.4/9066
3088004001	3052 River Road, Conestoga, PA	Field	
3088004001	3052 River Road, Conestoga, PA	S2540C-11	
3088004001	3052 River Road, Conestoga, PA	S4500HB-11	
3088004001	3052 River Road, Conestoga, PA	SM2130B-2011	
3088004001	3052 River Road, Conestoga, PA	SM2320B-2011	
3088004001	3052 River Road, Conestoga, PA	SM2510B-2011	
3088004001	3052 River Road, Conestoga, PA	SM5310B-2011	
3088004001	3052 River Road, Conestoga, PA	SW846 8260B	
3088004001	3052 River Road, Conestoga, PA	SW846 9020B	

ALS Environmental Laboratory Locations Across North America

JEOppred Leve - Matheman (N 1773 - March 170-446564) - F.M. FR2-1414 - Amerikanianiani 301 Evillang Mul Rood - Middlelovun, P.A. 17057 - 717,344 5541 - Fax: 717,344,1430	Fax: 717,944.1		ALL SHADI	HADED SAN	AREAS IPLER.	MUST E	CTIONS	DED AREAS MUST BE COMPLETED BY TH SAMPLER. INSTRUCTIONS ON THE BACK	BACK.	THE CLIENT CK.		= 1			-
Client Name: LCSWMA - Gerald E, Miller, Sr.		Container	AG	AN SN		AN C	00	ы Н	-	님	ц Ц	Pi	5 0 1	*	/ Receiving Lab)
Address: 3052 River Road		Container	40 ml	-	125 ml 250	250 ml 40	40 ml	- 250	250 ml 125 ml	-	125 ml 50	500 ml 500	500 ml Cooler Te	Cooler Temp: Q Them ID:	LAN
Conestoga, PA 17516		Preservative	PC	1 H2SO4	+	H2SO4 H	HCI I	- H2SOA	FONH HOS	-	HNO3 No	None No	None No. of Coolers:	lers:	N ¹ Initial
Contact: Gerald E. Miller, Sr.						ANALYS	ESIMETH	ANALYSESIMETHOD REQUESTED	JESTED					Custody Seals Present?	
Phone#: (717) 872-5117				-	-			-	'U		-	-		(If present) Seals Intact?	
Project Name/#: LCSWMA - Quarterly		_	_		-			-	W '6		-		1	Received on Ice?	-
Bill To: Lancaster County Solid Waste MA									W 'e				COCILab	COCILabels Complete/Accurate?	
TAT X Normal-Standard TAT is 10-12 business days. TAT Rush-Subject to ALS approval and surcharges. Date Required:	ess days. urcharges. 3y:					-our	\$20A C		elals: Ca, Fe		DS' NO3' CI			Cont. In Good Cond.? Correct Containers? Correct Sample Volumes?	
~~		-	_		-	JUG 3	070-0	4' COI		_		00	H 'Kaju	Correct Preservation?	
Fax? -Y No.:		_	_	HC	-		-	-	-	EN		ds '	IIIP	Headspace/Volatiles?	
Sample Description/Location Sample (as it will appear on the lab report) Date	e Time	no D*	01	-	1.1	Number of	Containel	C S 준 芝 Ö ✓ 툴 Enter Number of Containers Per Sample or Field Results Below	ple or Fie	K Results	Below.	91	Counier/Tracking #: Sam	acking #: Sample/COC Comments	nts
1 3052RIVERRD 02/21/20	20 1050	G DW	W 2			2 3	XX				+	÷	Ŧ		
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10		-	-	-	+		+	+	+	-				ite_Sampling	CRental_Equipment
Project Comments:	LOGGED	LOGGED BY(signature).	*					31YG		n:		Se	Standard	Special Processing	State Samples
	REVIEWE	REVIEWED BY(signature):	:(eun					335		711	ete	lders [][CLP-like	USACE	Collected In
Belingpished By / Company Name	Date	Time		1	leceived	Beceived By / Company Name	pany Nai	26	11	Date T	Time D	Delive	USACE	Navy	À Ì
A AN INVENTION THAT THE	1.19.1	AL DI NY-12-4		1	1				14	-	1	Reportabl	Reportable to PADEP?	Sample Disposal	XPA
5			9							-		Yes		X qer	y D
			80						-	-	đ	# DISMd		Special	
		ļ	1								-				

ALS

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

Condition of Sample Receipt Form

	NONE YES NONE YES TE	R N N N N N N N N N N N N N N N N N N N
2. Are Custody Seals on shipping containers intact?	NOR YES	N N
3. Are Custody Seals on sample containers intact?	NOR YES	N N
		N
5. Are the COC and bottle labels complete, legible and in agreement?	monorma TES	
Sa. Does the COC contain sample locations?		N
Sb. Does the COC contain date and time of sample collection for all samples? Sc. Does the COC contain sample collectors name? Sd. Does the COC note the type(s) of preservation for all bottles? Se. Does the COC note the type(s) of preservation for all bottles? Se. Does the COC note the number of bottles submitted for each sample? Sf. Does the COC note the number of bottles submitted for each sample? Sg. Does the COC note the matrix of the sample(s)? Se. Are all aqueous samples requiring preservation preserved correctly? N/A Were all samples placed in the proper containers for the requested analyses, with sufficient volume? S. Are all samples within holding times for the requested analyses? Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? Di bla the client provide a SDWA NEW ID#?	(YES)	e - 193
Sc. Does the COC contain sample collectors name?	~	N
5d. Does the COC note the type(s) of preservation for all bottles?		N
Se. Does the COC note the number of bottles submitted for each sample? Sf. Does the COC note the type of sample, composite or grab? Sg. Does the COC note the matrix of the sample(s)? Se. Are all aqueous samples requiring preservation preserved correctly? ¹ N/A ?. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? S. Are all samples placed in the proper containers for the requested analyses, with sufficient volume? S. Are all samples containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) So lid we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? So Were samples received on ice? So Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below So Did the client provide a SDWA PWS ID#? N/A N/A N/A N/A So Did the client provide the SDWA sample location ID/Description? N/A N/A N/A N/A N/A So Did the client provide the SDWA sample location ID/Description? N/A N/A N/A N/A N/A N/A		N
5f. Does the COC note the type of sample, composite or grab?		
5g. Does the COC note the matrix of the sample(s)? N/A 5. Are all aqueous samples requiring preservation preserved correctly? N/A 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? N/A 8. Are all samples within holding times for the requested analyses? N/A 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) N/A 9. Were all sample containers received on ice? N/A 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? N/A 11. Were the samples received on ice? N/A 2. Were sample temperatures measured at 0.0-6.0°C N/A 3. Are the samples required for SDWA compliance reporting? N/A 13a. Are the samples required for SDWA compliance reporting? N/A 13b. Did the client provide a SDWA PWS ID#? N/A 13c. Are all aqueous unpreserved SDWA samples pH 5-9? N/A 13b. Did the client provide the SDWA sample location ID/Description? N/A 13c. Order #: N/A 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A		N
5. Are all aqueous samples requiring preservation preserved correctly? N/A 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? N/A 8. Are all samples within holding times for the requested analyses? N/S P/S 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) N/A 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) N/A 10. Did we receive trip blanks (applies only for methods EPA S04, EPA 524.2 and 1631E (LL Hg)? N/A 11. Were the samples received on ice? N/A 12. Were sample temperatures measured at 0.0-6.0°C N/A 13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below N/A 13a. Are the samples required for SDWA compliance reporting? N/A 13b. Did the client provide a SDWA PWS ID#? N/A 13c. Are all aqueous unpreserved SDWA samples pH 5-9? N/A 13d. Did the client provide the SDWA sample location ID/Description? N/A 14. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A N/A N/A		N
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? 8. Are all samples within holding times for the requested analyses? 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 90. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 11. Were the samples received on ice? 12. Were sample temperatures measured at 0.0-6.0°C 13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting? 13b. Did the client provide a SDWA PWS ID#? 13c. Are all aqueous unpreserved SDWA samples pH 5-9? 13d. Did the client provide the SDWA sample location ID/Description? 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? Cooler #:		N
	\sim	N
		CN
D. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	0	N
1. Were the samples received on ice?		N
2. Were sample temperatures measured at 0.0-6.0°C 3. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting?		N
3. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below. 1.3a. Are the samples required for SDWA compliance reporting?		N
13a. Are the samples required for SDWA compliance reporting? N/A 13b. Did the client provide a SDWA PWS ID#? N/A 13c. Are all aqueous unpreserved SDWA samples pH 5-9? N/A 13d. Did the client provide the SDWA sample location ID/Description? N/A 13e. Did the client provide the SDWA sample location ID/Description? N/A N/A N/A 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A Cooler #:		
I 3b. Did the client provide a SDWA PWS ID#?		(NI
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	~	N
13d. Did the client provide the SDWA sample location ID/Description?	100 M	N
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	100 A 10	N
		N
		-
Temperature (°C): 2		
Thermometer ID: 497		
Radiological (µCi):		







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

March 5, 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:	3088441
Purchase Order:	PO1000126	Workorder ID:	1ST QTR 2020 3056 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, February 25, 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.

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

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

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

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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: 3088441 1ST QTR 2020 3056 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3088441001	3056RIVERRD	Water	2/25/2020 17:38	2/25/2020 19:15	Mr. Brian G Shade

ALS Environmental Laboratory Locations Across North America





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SAMPLE SUMMARY

Workorder: 3088441 1ST 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 Laboratory Locations Across North America





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ANALYTICAL RESULTS

Workorder: 3088441 1ST QTR 2020 3056 RIVER RD

Lab ID: 3088441001 Sample ID: 3056RIVERRE)				Date Collected: Date Received:			Matrix: V	/ater	
Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			2/27/20 15:00	DPC	К
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/20 15:00	DPC	К
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/20 15:00	DPC	К
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/20 15:00	DPC	К
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/20 15:00	DPC	К
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/20 15:00	DPC	К
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/27/20 15:00	DPC	К
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/27/20 15:00	DPC	К
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/27/20 15:00	DPC	К
Toluene	ND		ug/L	1.0	SW846 8260B			2/27/20 15:00	DPC	К
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/27/20 15:00	DPC	К
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/20 15:00	DPC	К
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/20 15:00	DPC	К
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			2/27/20 15:00	DPC	К
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/27/20 15:00	DPC	К
						- (A	~	Orata
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	Results 104	Flag	Units %	Limits 62 - 133	Method SW846 8260B	Prepared	Ву	2/27/20 15:00	By DPC	K
		Flag				Prepared	Ву			
1,2-Dichloroethane-d4 (S)	104	Flag	%	62 - 133	SW846 8260B	Prepared	Ву	2/27/20 15:00	DPC	К
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S)	104 102	Flag	%	62 - 133 79 - 114	SW846 8260B SW846 8260B	Prepared	Ву	2/27/20 15:00 2/27/20 15:00	DPC DPC	K K
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S)	104 102 92.4	Flag	% % %	62 - 133 79 - 114 78 - 116	SW846 8260B SW846 8260B SW846 8260B	Prepared	Ву	2/27/20 15:00 2/27/20 15:00 2/27/20 15:00	DPC DPC DPC	K K K
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S)	104 102 92.4	Flag	% % %	62 - 133 79 - 114 78 - 116	SW846 8260B SW846 8260B SW846 8260B	Prepared	Ву	2/27/20 15:00 2/27/20 15:00 2/27/20 15:00	DPC DPC DPC	К К К
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY	104 102 92.4 96.6	<i>Flag</i>	% % %	62 - 133 79 - 114 78 - 116 76 - 127	SW846 8260B SW846 8260B SW846 8260B SW846 8260B	Prepared	Ву	2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00	DPC DPC DPC DPC	К К К
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate	104 102 92.4 96.6 ND		% % % mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B	Prepared	Ву	2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00	DPC DPC DPC DPC MBW	к к к с
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand	104 102 92.4 96.6 ND ND		% % % mg/L mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011	Prepared	Ву	2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/28/20 22:45 2/28/20 22:45	DPC DPC DPC DPC MBW MBW	К К К С С
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N	104 102 92.4 96.6 ND ND ND		% % % mg/L mg/L mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09	Prepared	Ву	2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/28/20 22:45 2/28/20 22:45 2/29/20 13:42	DPC DPC DPC DPC MBW MBW JWB	К К К С С В В
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD)	104 102 92.4 96.6 ND ND ND ND		% % % mg/L mg/L mg/L mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100 15	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4	Prepared	Ву	2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/28/20 22:45 2/28/20 22:45 2/29/20 13:42 2/27/20 21:15	DPC DPC DPC DPC MBW MBW JWB JWB	К К К С С В В
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic	104 102 92.4 96.6 ND ND ND ND 25.4		% % % mg/L mg/L mg/L mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0	Prepared	Ву	2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/28/20 22:45 2/28/20 22:45 2/29/20 13:42 2/27/20 21:15 2/26/20 14:05	DPC DPC DPC DPC MBW MBW JWB JAM MBW	К К К С С В В С
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride	104 102 92.4 96.6 ND ND ND ND 25.4 ND		% % % mg/L mg/L mg/L mg/L mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0	Prepared	Ву	2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/28/20 22:45 2/28/20 22:45 2/28/20 22:45 2/29/20 13:42 2/27/20 21:15 2/26/20 14:05 2/26/20 14:05	DPC DPC DPC DPC MBW MBW JWB JAM MBW MBW	К К К С С В В С С С І
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Armonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX)	104 102 92.4 96.6 ND ND ND 25.4 ND ND		% % % mg/L mg/L mg/L mg/L ug/L ug/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0 0.20 20.0	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B	Prepared	Ву	2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/28/20 22:45 2/28/20 22:45 2/29/20 13:42 2/27/20 13:42 2/27/20 14:05 2/26/20 14:05 2/26/20 14:05 2/27/20 12:07	DPC DPC DPC DPC MBW MBW JWB JAM MBW MBW PAG	К К К С С В В С С С І
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N	104 102 92.4 96.6 ND ND ND 25.4 ND ND 25.4 ND ND 18.8		% % % mg/L mg/L mg/L mg/L ug/L ug/L mg/L mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0 0.20 20.0 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0	Prepared	Ву	2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/28/20 22:45 2/28/20 22:45 2/28/20 22:45 2/29/20 13:42 2/27/20 21:15 2/26/20 14:05 2/26/20 14:05 2/27/20 12:07 2/26/20 14:05	DPC DPC DPC DPC MBW MBW JWB JAM MBW MBW PAG MBW	К К К С С В В С С С І С
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N pH	104 102 92.4 96.6 ND ND ND ND 25.4 ND 18.8 ND 5.40	1	% % % mg/L mg/L mg/L mg/L ug/L mg/L mg/L mg/L mg/L mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 0.100 15 2.0 0.20 20.0 0.20 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0 EPA 300.0 S4500HB-11			2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/28/20 22:45 2/28/20 22:45 2/29/20 13:42 2/27/20 21:15 2/26/20 14:05 2/26/20 14:05 2/26/20 14:05 2/26/20 14:05 2/26/20 14:05 2/26/20 14:05 2/28/20 22:45	DPC DPC DPC DPC DPC MBW JWB JAM MBW PAG MBW MBW MBW	К К К С С С В В В С С С С С С
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N pH Phenolics	104 102 92.4 96.6 ND ND ND 25.4 ND 25.4 ND 18.8 ND 5.40 ND	1	% % % % mg/L mg/L mg/L mg/L ug/L mg/L pH_Units mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0 0.20 20.0 0.20 0.20 0.20 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0 EPA 300.0 S4500HB-11 EPA 420.4	2/26/20 08:13		2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/28/20 22:45 2/28/20 22:45 2/29/20 13:42 2/27/20 21:15 2/26/20 14:05 2/26/20 14:05 2/26/20 14:05 2/26/20 14:05 2/28/20 22:45 2/28/20 22:45 2/26/20 05:48	DPC DPC DPC DPC MBW JWB JWB JAM MBW PAG MBW MBW MBW C_D	К К К С С С В В С С С С С Ц С С С Н
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N pH	104 102 92.4 96.6 ND ND ND ND 25.4 ND 18.8 ND 5.40	1	% % % mg/L mg/L mg/L mg/L ug/L mg/L mg/L mg/L mg/L mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 0.100 15 2.0 0.20 20.0 0.20 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0 EPA 300.0 S4500HB-11			2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/27/20 15:00 2/28/20 22:45 2/28/20 22:45 2/29/20 13:42 2/27/20 21:15 2/26/20 14:05 2/26/20 14:05 2/26/20 14:05 2/26/20 14:05 2/26/20 14:05 2/26/20 14:05 2/28/20 22:45	DPC DPC DPC DPC MBW JWB JWB JAM MBW PAG MBW MBW MBW C_D	К К К С С С В В В С С С С С С

ALS Environmental Laboratory Locations Across North America





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ANALYTICAL RESULTS

Workorder: 3088441 1ST QTR 2020 3056 RIVER RD

Lab ID: 3088441001 Sample ID: 3056RIVERRD	1				2/25/2020 17:38 2/25/2020 19:15	Matrix: W	/ater	
Parameters	Results	Flag Units	RDL	Method	Prepared By	Analyzed	Ву	Cntr
Total Dissolved Solids	152	mg/L	25	S2540C-11		2/26/20 18:38	D1C	С
Total Organic Carbon (TOC)	ND	mg/L	0.50	SM5310B-2011		2/26/20 23:02	PAG	F
Turbidity	ND	NTU	0.10	SM2130B-2011		2/26/20 06:57	R2B	С
METALS								
Calcium, Total	10.9	mg/L	0.050	EPA 200.7	2/28/20 10:25 AHI	3/2/20 13:52	MNP	D
Calcium, Dissolved	11.3	mg/L	0.10	EPA 200.7	3/4/20 07:53 MN	P 3/4/20 09:54	MNP	E
Iron, Total	ND	mg/L	0.030	EPA 200.7	2/28/20 10:25 AHI	3/2/20 13:52	MNP	D
Iron, Dissolved	ND	mg/L	0.060	EPA 200.7	3/4/20 07:53 MN	P 3/4/20 09:54	MNP	E
Magnesium, Total	12.1	mg/L	0.050	EPA 200.7	2/28/20 10:25 AHI	3/2/20 13:52	MNP	D
Magnesium, Dissolved	12.2	mg/L	0.10	EPA 200.7	3/4/20 07:53 MN	9 3/4/20 09:54	MNP	E
Manganese, Total	0.071	mg/L	0.0025	EPA 200.7	2/28/20 10:25 AHI	3/2/20 13:52	MNP	D
Manganese, Dissolved	0.072	mg/L	0.0050	EPA 200.7	3/4/20 07:53 MN	9 3/4/20 09:54	MNP	E
Potassium, Total	1.6	mg/L	0.25	EPA 200.7	2/28/20 10:25 AHI	3/2/20 13:52	MNP	D
Potassium, Dissolved	3.4	mg/L	0.50	EPA 200.7	3/4/20 07:53 MN	9 3/4/20 09:54	MNP	E
Sodium, Total	7.6	mg/L	0.25	EPA 200.7	2/28/20 10:25 AHI	3/2/20 13:52	MNP	D
Sodium, Dissolved	8.1	mg/L	0.50	EPA 200.7	3/4/20 07:53 MN	9 3/4/20 09:54	MNP	E
FIELD PARAMETERS								
pH, Field (SM4500B)	5.61	pH_Units		Field		2/25/20 17:38	BGS	Μ
Specific Conductance, Field	271	umhos/cm	1	Field		2/25/20 17:38	BGS	Μ
Temperature	13.50	Deg. C		Field		2/25/20 17:38	BGS	Μ

Susand. Schare

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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ANALYTICAL RESULTS

Workorder: 3088441 1ST QTR 2020 3056 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3088441001	1	3056RIVERRD	SM2320B-2011	Alkalinity, Total
The Total Alkalinit	ty is titrate	ed to a pH of 4.5 and repo	rted as mg CaCO3/L.	
3088441001	2	3056RIVERRD	S4500HB-11	рН
			. Parameters identified as "analyze immed	liately" require analysis within 15 minutes of

collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.

ALS Environmental Laboratory Locations Across North America





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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3088441 1ST QTR 2020 3056 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	
3088441001	3056RIVERRD	ASTM D6919-09		
3088441001	3056RIVERRD	EPA 200.7	EPA ACID	
3088441001	3056RIVERRD	EPA 200.7	EPA TRMD	
3088441001	3056RIVERRD	EPA 300.0		
3088441001	3056RIVERRD	EPA 410.4		
3088441001	3056RIVERRD	EPA 420.4	420.4/9066	
3088441001	3056RIVERRD	Field		
3088441001	3056RIVERRD	S2540C-11		
3088441001	3056RIVERRD	S4500HB-11		
3088441001	3056RIVERRD	SM2130B-2011		
3088441001	3056RIVERRD	SM2320B-2011		
3088441001	3056RIVERRD	SM2510B-2011		
3088441001	3056RIVERRD	SM5310B-2011		
3088441001	3056RIVERRD	SW846 8260B		
3088441001	3056RIVERRD	SW846 9020B		

ALS Environmental Laboratory Locations Across North America

(ALCS) ETTOR TIME TARE - New 2014 (KII + 1% 70/1444) - PERAPANAN Jameruw - Materian 12 (1921 - New 2014) (KII + 18, 717) (44, 5541 + Fair 717) (44, 1430) 201 Future Mill Read + Modelintean, PA 17057 + 717) (44, 5541 + Fair 717) (44, 1430)	717 944 5541 · F	au: 717.944.145		ALL SHADE S	JED ARE SAMPLE	AS MUS R. INSTI	T BE CC RUCTIO	ED AREAS MUST BE COMPLETED BY THE CLIENT / AMPLER. INSTRUCTIONS ON THE BACK.	D BY TH HE BACK	E CLIEN	111	-1				-
Client Name: Lancaster County Solid Waste MA	faste MA		Container	AG	AN	AN	8	1	Ы	PL	ň	PL 1	n *	- + +	. by Recei	by Receiving Lab)
Address: 1299 Harrisburg Pike, P.O. Box 4424	IX 4424		Container	40 ml	125 ml	250 ml	40 ml	L	250 ml 1	125 ml	125 ml	500 ml	500 ml Cools	Cooler Temp: 8 The	Them ID: 44	
Lancaster, PA 17604			Preservative	HCI	H2SO4	H2SO4	ę	1	H2SO4	8	FONH	None	None No. of	No. of Coolers:	²[≻[Initial
Contact: Dan Brown						ANA	YSESIM	ANALYSES/METHOD REQUESTED	EQUESTE	_	t	Ī	1	Custody Seals Present?		
Phone#: (717) 735-0193					2					·0		1		(if present) Seals Intact?		
Project Namef#: LCSWMA - Quarterly			_							N '6	-	d'E		Received on Ice?		
Bill To: Lancaster County Solid Waste MA	MA								102	w 'a		os'	ğ	COC/Labels Complete/Accurate?		
TAT X Normal-Standard TAT is 10-12 business days. Rush-Subject to ALS approval and surcharges.	a 10-12 busine proval and su	ss days. rcharges.					NOCS		-	ej 'ej :stel	'uw '6w 'a	1) 'EON 'Z	603	Cont. In Good Cond.? Correct Containers? Correct Sample Volumes?		
Email? .Y	- In matorialia						8560		000	ew De	1		у, нс	Correct Preservation?		
			_	~	н	,	1998				-	Spc)inile	Headspace/Volatiles?		
Sample Description/Location [ast] well appear on the lab report]	Sample	Time) to 9* UtateM**	001	0-0	10) Iter Numbe	rof Conta	〇 ※ ※ ※ 光 道 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	AH Manual	ield Resu	tts Below	'Hd	-	Courier(Tracking #: Sample/COC Comments	Comments	
1 2056RIVERRD	ADDEIDO	-	-	c	-	•	-	×	-	-		÷				
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Project Comments:		LOGGED B	LOGGED BY (signature):					PA0	-	71		Sa	Standard	Special Processing	1	State Samples
		REVIEWED	REV(EWED BY (signature):	4				3140		301		ete Idera	CLP-like	USACE		Collected In
tuished By / Compar	N Name	Date	Time		Recei	Received By / Company Name	ompany	Name		_	Time	Deliv	INSACE	en N	Navy	z Z
A L SQ WWW P	at	14-64-0	SAL I		12	de	1		A.	and	5113	Reports	Reportable to PADEP?	Sample Dis	sposal X	
				0 00				ł	1	T		FWSID #	1	Special		
													PURCE LANSAURIAN			

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301 Fulling Mill Road Middletown, PA 17057 P: (717) 944-5541 F: (717) 944-1430	Condition of Sar	nple Receipt Form
Client: UCSW Work Order #	3088441 Initiale	Date: 2/0/20
1. Were airbills / tracking numbers present and recorded Tracking nu		NONE YES NO
2. Are Custody Seals on shipping containers intact?		NONE SES NO
3. Are Custody Seals on sample containers intact?		
4. Is there a COC (Chain-of-Custody) present?		
5. Are the COC and bottle labels complete, legible and in		
Sa. Does the COC contain sample locations?		NO.
5b. Does the COC contain date and time of sample co	ection for all samples?	YES NO
5c. Does the COC contain sample collectors name?		
5d. Does the COC note the type(s) of preservation for		
Se. Does the COC note the number of bottles submitte	d for each sample?	
5f. Does the COC note the type of sample, composite		
5g. Does the COC note the matrix of the sample(s)?		NO
6. Are all aqueous samples requiring preservation preserv		N/A GER NO

6. Are all aqueous samples requiring preservation preserved correctly?"	YES-	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?	CYES	NO
8. Are all samples within holding times for the requested analyses?	FES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)	VES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	YES	NO
11. Were the samples received on ice?	(YES)	NO
	(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below	(ES)	NO L
13a. Are the samples required for SDWA compliance reporting?	YES	(NO
13b. Did the client provide a SDWA PWS ID#?	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	YES	NO
13e. Did the client provide the SDWA sample type (D. F. R. C. P. 5)?	VES	NO

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	신 것같은 눈을 가져 들었는데, 것

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

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

Rev 1/20/2020







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

March 5, 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:	3088440
Purchase Order:	PO1000126	Workorder ID:	1ST QTR 2020 3060 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, February 25, 2020.

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

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

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

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

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

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

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

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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SAMPLE SUMMARY

Workorder: 3088440 1ST QTR 2020 3060 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3088440001	3060RIVERRD	Water	2/25/2020 17:47	2/25/2020 19:15	Mr. Brian G Shade

ALS Environmental Laboratory Locations Across North America





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SAMPLE SUMMARY

Workorder: 3088440 1ST 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 Laboratory Locations Across North America





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: 3088440 1ST QTR 2020 3060 RIVER RD

Lab ID: 3088440001 Sample ID: 3060RIVERRD)				Date Collected: Date Received:			Matrix: W	/ater	
Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			2/27/20 14:38	DPC	К
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/20 14:38	DPC	К
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/20 14:38	DPC	К
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/20 14:38	DPC	К
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/20 14:38	DPC	К
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/20 14:38	DPC	К
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/27/20 14:38	DPC	К
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/27/20 14:38	DPC	К
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/27/20 14:38	DPC	К
Toluene	ND		ug/L	1.0	SW846 8260B			2/27/20 14:38	DPC	К
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/27/20 14:38	DPC	К
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/20 14:38	DPC	К
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/20 14:38	DPC	К
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			2/27/20 14:38	DPC	К
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/27/20 14:38	DPC	к
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
0	ncouns	i lag	Units	LIIIIIIS	Method	riepaieu	Бу	Analyzeu	Бу	Ond
1,2-Dichloroethane-d4 (S)	104	Tidg	%	62 - 133	SW846 8260B	Перагец	Бу	2/27/20 14:38	DPC	K
		Tidy				Tepared	Бу			
1,2-Dichloroethane-d4 (S)	104	, lag	%	62 - 133	SW846 8260B	Терагеч	Бу	2/27/20 14:38	DPC	К
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S)	104 102	, lag	%	62 - 133 79 - 114	SW846 8260B SW846 8260B	Терагеч		2/27/20 14:38 2/27/20 14:38	DPC DPC	K K
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S)	104 102 94.8	, lug	% % %	62 - 133 79 - 114 78 - 116	SW846 8260B SW846 8260B SW846 8260B	Tepareu	Dy	2/27/20 14:38 2/27/20 14:38 2/27/20 14:38	DPC DPC DPC	K K K
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S)	104 102 94.8	, lug	% % %	62 - 133 79 - 114 78 - 116	SW846 8260B SW846 8260B SW846 8260B	Tepareu		2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38	DPC DPC DPC	К К К
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY	104 102 94.8 96.3	1	% % %	62 - 133 79 - 114 78 - 116 76 - 127	SW846 8260B SW846 8260B SW846 8260B SW846 8260B	Tiepareu	Ly	2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38	DPC DPC DPC DPC	К К К
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate	104 102 94.8 96.3 13		% % % mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B	Tipareu	Ly	2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38	DPC DPC DPC DPC MBW	к к к с
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand	104 102 94.8 96.3 13 13		% % % mg/L mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011	Tepareu	By	2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/28/20 22:45 2/28/20 22:45	DPC DPC DPC DPC MBW MBW	К К К С С
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N	104 102 94.8 96.3 13 13 ND		% % % mg/L mg/L mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09	Tipareu	By	2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/28/20 22:45 2/28/20 22:45 2/29/20 13:29	DPC DPC DPC DPC MBW MBW JWB	К К К С С В
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD)	104 102 94.8 96.3 13 13 ND ND		% % % mg/L mg/L mg/L mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100 15	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4	Tipareu	By	2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/28/20 22:45 2/28/20 22:45 2/29/20 13:29 2/27/20 21:15	DPC DPC DPC DPC MBW MBW JWB JWB	К К К С С В В В
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Armonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic	104 102 94.8 96.3 13 13 ND ND 22.3		% % % mg/L mg/L mg/L mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0	Tipareu	By	2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/28/20 22:45 2/28/20 22:45 2/29/20 13:29 2/27/20 21:15 2/26/20 13:49	DPC DPC DPC DPC MBW MBW JWB JAM MBW	К К К С С В В С
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride	104 102 94.8 96.3 13 13 ND ND 22.3 ND		% % % mg/L mg/L mg/L mg/L ug/L ug/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0	Tipareu	By	2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/28/20 22:45 2/28/20 22:45 2/28/20 22:45 2/29/20 13:29 2/27/20 21:15 2/26/20 13:49 2/26/20 13:49	DPC DPC DPC DPC MBW MBW JWB JAM MBW MBW	К К К С С В В В С С
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX)	104 102 94.8 96.3 13 13 ND ND 22.3 ND ND		% % % mg/L mg/L mg/L mg/L ug/L ug/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0 0.20 20.0	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B	Tipareu	By	2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/28/20 22:45 2/28/20 22:45 2/29/20 13:29 2/27/20 21:15 2/26/20 13:49 2/26/20 13:19	DPC DPC DPC DPC MBW MBW JWB JAM MBW MBW PAG	К К К С С В В С С С І
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N	104 102 94.8 96.3 13 13 ND ND 22.3 ND ND 15.3 ND	1	% % % mg/L mg/L mg/L mg/L ug/L ug/L mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0 0.20 20.0 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 EPA 300.0 EPA 300.0	Tipareu	by	2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/28/20 22:45 2/28/20 22:45 2/29/20 13:29 2/27/20 21:15 2/26/20 13:49 2/26/20 13:49 2/26/20 13:49 2/26/20 13:49	DPC DPC DPC DPC MBW MBW JWB JAM MBW PAG MBW MBW	К К К С С В В С С С І С С
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N pH	104 102 94.8 96.3 13 13 ND ND 22.3 ND ND 15.3 ND 5.89		% % % mg/L mg/L mg/L mg/L ug/L mg/L mg/L mg/L mg/L pH_Units	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0 0.20 20.0 0.20 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0 EPA 300.0 S4500HB-11			2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/28/20 22:45 2/28/20 22:45 2/29/20 13:29 2/27/20 21:15 2/26/20 13:49 2/26/20 13:49 2/26/20 13:49 2/26/20 13:49 2/26/20 13:49 2/26/20 13:49	DPC DPC DPC DPC DPC MBW JWB JAM MBW PAG MBW MBW MBW	К К К С С С В В В С С С С С С
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N pH Phenolics	104 102 94.8 96.3 13 13 ND ND 22.3 ND 22.3 ND 15.3 ND 5.89 ND	1	% % % % mg/L mg/L mg/L mg/L ug/L mg/L pH_Units mg/L	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0 0.20 20.0 0.20 0.20 0.20 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0 EPA 300.0 S4500HB-11 EPA 420.4	2/26/20 08:13		2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/28/20 22:45 2/28/20 22:45 2/29/20 13:29 2/27/20 21:15 2/26/20 13:49 2/26/20 13:49 2/26/20 13:49 2/26/20 13:49 2/26/20 13:49 2/28/20 22:45 2/26/20 05:48	DPC DPC DPC DPC MBW JWB JWB JAM MBW PAG MBW MBW MBW C_D	К К К С С С В В С С С С І С С С Н
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N pH	104 102 94.8 96.3 13 13 ND ND 22.3 ND ND 15.3 ND 5.89	1	% % % mg/L mg/L mg/L mg/L ug/L mg/L mg/L mg/L mg/L pH_Units	62 - 133 79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0 0.20 20.0 0.20 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0 EPA 300.0 S4500HB-11			2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/27/20 14:38 2/28/20 22:45 2/28/20 22:45 2/29/20 13:29 2/27/20 21:15 2/26/20 13:49 2/26/20 13:49 2/26/20 13:49 2/26/20 13:49 2/26/20 13:49 2/26/20 13:49	DPC DPC DPC DPC DPC MBW JWB JAM MBW PAG MBW MBW MBW	К К К С С С В В С С С С І С С С Ц С С С Н С С С Н С С С С В В В С С С С С

ALS Environmental Laboratory Locations Across North America





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: 3088440 1ST QTR 2020 3060 RIVER RD

Lab ID: 3088440001 Sample ID: 3060RIVERRD	1				2/25/2020 17:47 2/25/2020 19:15	Matrix: W	/ater	
Parameters	Results	Flag Units	RDL	Method	Prepared By	Analyzed	Ву	Cntr
Total Dissolved Solids	130	mg/L	25	S2540C-11		2/26/20 18:38	D1C	С
Total Organic Carbon (TOC)	ND	mg/L	0.50	SM5310B-2011		2/26/20 23:02	PAG	F
Turbidity	1.78	NTU	0.10	SM2130B-2011		2/26/20 06:57	R2B	С
METALS								
Calcium, Total	9.4	mg/L	0.050	EPA 200.7	2/27/20 15:55 SXC	2/28/20 13:07	MNP	D
Calcium, Dissolved	10.7	mg/L	0.10	EPA 200.7	3/4/20 07:53 MNF	3/4/20 09:44	MNP	E
Iron, Total	0.039	mg/L	0.030	EPA 200.7	2/27/20 15:55 SXC	2/28/20 13:07	MNP	D
Iron, Dissolved	ND	mg/L	0.060	EPA 200.7	3/4/20 07:53 MNF	3/4/20 09:44	MNP	E
Magnesium, Total	10.1	mg/L	0.050	EPA 200.7	2/27/20 15:55 SXC	2/28/20 13:07	MNP	D
Magnesium, Dissolved	10.8	mg/L	0.10	EPA 200.7	3/4/20 07:53 MNF	9 3/4/20 09:44	MNP	E
Manganese, Total	0.11	mg/L	0.0025	EPA 200.7	2/27/20 15:55 SXC	3/2/20 12:49	MNP	D
Manganese, Dissolved	0.10	mg/L	0.0050	EPA 200.7	3/4/20 07:53 MNF	9 3/4/20 09:44	MNP	E
Potassium, Total	2.0	mg/L	0.25	EPA 200.7	2/27/20 15:55 SXC	2/28/20 13:07	MNP	D
Potassium, Dissolved	4.1	mg/L	0.50	EPA 200.7	3/4/20 07:53 MNF	9 3/4/20 09:44	MNP	E
Sodium, Total	7.2	mg/L	0.25	EPA 200.7	2/27/20 15:55 SXC	2/28/20 13:07	MNP	D
Sodium, Dissolved	8.3	mg/L	0.50	EPA 200.7	3/4/20 07:53 MNF	9 3/4/20 09:44	MNP	E
FIELD PARAMETERS								
pH, Field (SM4500B)	5.58	pH_Units		Field		2/25/20 17:47	BGS	Μ
Specific Conductance, Field	348	umhos/cm	1	Field		2/25/20 17:47	BGS	Μ
Temperature	13.20	Deg. C		Field		2/25/20 17:47	BGS	Μ

Susand. Schare

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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ANALYTICAL RESULTS

Workorder: 3088440 1ST QTR 2020 3060 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte						
3088440001	1	3060RIVERRD	SM2320B-2011	Alkalinity, Total						
The Total Alkalinit	The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.									
3088440001	2	3060RIVERRD	S4500HB-11	рН						
		, , , , , , , , , , , , , , , , , , ,	. Parameters identified as "analyze immed	diately" require analysis within 15 minutes of						

collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.

ALS Environmental Laboratory Locations Across North America





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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3088440 1ST QTR 2020 3060 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	
3088440001	3060RIVERRD	ASTM D6919-09		_
3088440001	3060RIVERRD	EPA 200.7	EPA ACID	
3088440001	3060RIVERRD	EPA 200.7	EPA TRMD	
3088440001	3060RIVERRD	EPA 300.0		
3088440001	3060RIVERRD	EPA 410.4		
3088440001	3060RIVERRD	EPA 420.4	420.4/9066	
3088440001	3060RIVERRD	Field		
3088440001	3060RIVERRD	S2540C-11		
3088440001	3060RIVERRD	S4500HB-11		
3088440001	3060RIVERRD	SM2130B-2011		
3088440001	3060RIVERRD	SM2320B-2011		
3088440001	3060RIVERRD	SM2510B-2011		
3088440001	3060RIVERRD	SM5310B-2011		
3088440001	3060RIVERRD	SW846 8260B		
3088440001	3060RIVERRD	SW846 9020B		

ALS Environmental Laboratory Locations Across North America

	9		AL	ALL SHAD	REOL	EST	REQUEST FOR ANALYSIS	NALY	SIS	E CLIEN	11			-IC
nd General (av address fri und) - frem 173-au 1441 - 120 173-au 120 - aver approvan "Dri Euders Mill Board v Möndelpforen. PA. 17057 + 717, 944.5541 + Fair: 717, 944.1430	41 * Fac: 717.9	4.1430	ł	S	AMPLE	R. INSTE	AMPLER. INSTRUCTIONS ON THE BACK	S ON TH	IE BACK			- [
Cilent Name: Lancaster County Solid Waste MA		3	Conceliner	AG	AN	AN	90	1	ъ	Ы	βĽ	PL /		A + + U + y Receiving Lab)
Address: 1299 Harrisburg Pike, P.O. Box 4424		3	Container	40 ml	125 ml	250 ml	40 ml	l	250 ml 1	125 ml	125 ml	500 ml	500 ml Cooler Temp:	Temp: & Thermid: 441
Lancaster. PA 17604		E	Preservative	P	H2SO4	H2SOA	오	1	H2SO4	HNO3	HNO3	None	None No. of Coolers:	
Contact: Dan Brown	ł	┝				ANAL	ANAL YSES/METHOD REQUESTED	THOD RE	QUESTE	0				Custody Scals Present?
Phone#: (717) 735-0193				T	Γ								1	(If present) Seals Intact?
Project Name#: LCSWMA - Quarterly		Г								w'f	-	'H'	-	Received on Ico?
Bill To: Lancaster County Solid Waste MA			_				-	-		6w *	-	POS	COCIL	COC/Lebels Complete/Accurate7
TAT X Normal-Standard TAT is 10-12 business days.	siness days Id surcharge	. vì					AOC®			ials: Ca, Fe	.nM ,eM ,s	5' MO3' CI'		Cont In Good Cond.? Carrect Containers? Correct Sample Volumes?
Email?	- in m						0928-		000	aw ba		C ON 'S	DH 'AI	Correct Preservation?
Fax? 7-Y No:			_	-5	H	X	948		÷.	RN		ds'		Headspace/Volatilies?
Sample Description/Location Sat	Sample Ti	Time 10 Of	intsM*	101	200	er Numbe	10 S 版 E E D ビ M M	LE Mers Pers	Z ample or F	Teld Resu	At Below	QT HQ		Courier/Tracking #: Sample/COC Comments
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Project Comments:	1000	LOGGED BY (alguature):	nature):					SHIE		311		Se	Standard	Special Processing State Samples
	REVIE	REVIEWED BY (signaturo):	gnature):					3345				ete eldste	CLP-like	3
Religquished ByACompany Name	0		Time		Receiv	ed By / C	Received By / Company Name	lame		Date	Time		USACE	Navy
IT & MOADOWN AT	a se) Were	CYN5 2	21	2al	-The	K	ii	dare	010	112	1		
3		-	4									Report	Reportable to PADEP?	Sample Disposal X
5			9									Yes	-	
2		1										# OISMd	# 01SM	Special
				-									OTTAGE I VOB-	

ALS

ALS	301 Fulling Mill Road Middletown, PA 17057 P: (717) 944-5541 F: (717) 944-1430	Condit	ion of Sample	e Receipt Form	
ient: 1 CSL	A) Work Order #	3088440	Initials:	Date: 2/25/20	\langle
Were airbills / tr	acking numbers present and recorded			NONE YES?	
	Tracking nur	mber:		- ~	
Are Custody Sea	Is on shipping containers intact?		****	NONE CYES	
	Is on sample containers intact?				ľ
	Chain-of-Custody) present?				į
	bottle labels complete, legible and in				1
Sa. Does the CO	OC contain sample locations?				1
	OC contain date and time of sample col			1 2	1
Sc. Does the CC	OC contain sample collectors name?			YES	1
5d. Does the CO	OC note the type(s) of preservation for	all bottles?			j
Se. Does the CC	OC note the number of bottles submitte	ed for each sample?		~	I

Sr. Does the COC note the type of sample, composite or grab?	VES/	NO
Sg. Does the COC note the matrix of the sample(s)?	VES	NO
6. Are all aqueous samples requiring preservation preserved correctly? ¹	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)?	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?	YES	(NO
13b. Did the client provide a SDWA PWS ID#?	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	YES	NO

	Cooler #:	 	
	Temperature (°C): 8		
۴	Thermometer ID: 441		
	Radiological (µCl):		

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

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

Rev 1/20/2020

CI



NO

NO NO NO

NO

NO

NO NO

NO





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

March 2, 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:	3088001
Purchase Order:	PO1000126	Workorder ID:	1ST QTR 2020-3076 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, February 21, 2020.

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

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

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

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

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

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

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

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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SAMPLE SUMMARY

Workorder: 3088001 1ST QTR 2020-3076 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3088001001	3076 River Road, Conestoga, PA	Water	2/21/2020 10:36	2/21/2020 15:43	Mr. Brian G Shade

ALS Environmental Laboratory Locations Across North America



LS) 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: 3088001 1ST QTR 2020-3076 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 Laboratory Locations Across North America





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: 3088001 1ST QTR 2020-3076 RIVER RD

Lab ID: 3088001001 Sample ID: 3076 River Ro	oad, Conest	oga, PA			Date Collected: Date Received:			Matrix: \	Vater	
Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:02	PDK	К
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 00:02	PDK	К
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 00:02	PDK	К
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:02	PDK	К
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:02	PDK	К
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:02	PDK	К
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:02	PDK	К
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/26/20 00:02	PDK	К
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:02	PDK	К
Toluene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:02	PDK	К
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/26/20 00:02	PDK	К
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 00:02	PDK	К
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:02	PDK	К
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			2/26/20 00:02		К
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/26/20 00:02	PDK	к
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	114		0/	00 400	014/04/00000			0/00/00 00 00	DDV	К
	114		%	62 - 133	SW846 8260B			2/26/20 00:02	PDK	K
4-Bromofluorobenzene (S)	114	3	%	62 - 133 79 - 114	SW846 8260B SW846 8260B			2/26/20 00:02 2/26/20 00:02		K
		3							PDK	
4-Bromofluorobenzene (S)	116	3	%	79 - 114	SW846 8260B			2/26/20 00:02	PDK PDK	К
4-Bromofluorobenzene (S) Dibromofluoromethane (S)	116 106	3	% %	79 - 114 78 - 116	SW846 8260B SW846 8260B			2/26/20 00:02 2/26/20 00:02	PDK PDK	K K
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S)	116 106	3	% %	79 - 114 78 - 116	SW846 8260B SW846 8260B			2/26/20 00:02 2/26/20 00:02	PDK PDK PDK	к к к
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY	116 106 109	3	% % %	79 - 114 78 - 116 76 - 127	SW846 8260B SW846 8260B SW846 8260B			2/26/20 00:02 2/26/20 00:02 2/26/20 00:02	PDK PDK PDK MBW	к к к
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate	116 106 109 10		% % % mg/L	79 - 114 78 - 116 76 - 127 5	SW846 8260B SW846 8260B SW846 8260B SW846 8260B			2/26/20 00:02 2/26/20 00:02 2/26/20 00:02 2/25/20 20:24	PDK PDK PDK MBW	к к с
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand	116 106 109 10 10		% % % mg/L mg/L	79 - 114 78 - 116 76 - 127 5 5	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011			2/26/20 00:02 2/26/20 00:02 2/26/20 00:02 2/25/20 20:24 2/25/20 20:24	PDK PDK PDK MBW MBW	к к с с
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Armonia-N	116 106 109 10 10 0.108		% % mg/L mg/L mg/L	79 - 114 78 - 116 76 - 127 5 5 0.100	SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09			2/26/20 00:02 2/26/20 00:02 2/26/20 00:02 2/25/20 20:24 2/25/20 20:24 2/28/20 04:30	PDK PDK PDK MBW MBW JWB	К К С С В В
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD)	116 106 109 10 10 0.108 ND		% % mg/L mg/L mg/L mg/L	79 - 114 78 - 116 76 - 127 5 5 0.100 15	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4			2/26/20 00:02 2/26/20 00:02 2/26/20 00:02 2/25/20 20:24 2/25/20 20:24 2/28/20 04:30 2/26/20 23:30	PDK PDK PDK MBW JWB JWB JAM	К К С С В В С
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride	116 106 109 10 0.108 ND 48.5		% % mg/L mg/L mg/L mg/L	79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0	SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0			2/26/20 00:02 2/26/20 00:02 2/26/20 00:02 2/25/20 20:24 2/25/20 20:24 2/28/20 04:30 2/26/20 23:30 2/22/20 10:19	PDK PDK PDK MBW JWB JAM MBW MBW	К К С С В В С
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic	116 106 109 10 0.108 ND 48.5 ND		% % mg/L mg/L mg/L mg/L mg/L	79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0 0.20	SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0			2/26/20 00:02 2/26/20 00:02 2/26/20 00:02 2/25/20 20:24 2/25/20 20:24 2/25/20 04:30 2/26/20 23:30 2/22/20 10:19 2/22/20 10:19	PDK PDK PDK MBW JWB JAM MBW MBW PAG	К К С С В В С С С І
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX)	116 106 109 10 0.108 ND 48.5 ND ND		% % mg/L mg/L mg/L mg/L mg/L ug/L	79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0 0.20 20.0	SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B			2/26/20 00:02 2/26/20 00:02 2/25/20 20:24 2/25/20 20:24 2/28/20 04:30 2/26/20 23:30 2/22/20 10:19 2/22/20 10:19 2/22/20 13:35	PDK PDK PDK MBW JWB JAM MBW MBW PAG MBW	К К С С В В С С С І С
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N	116 106 109 10 0.108 ND 48.5 ND ND 10.1		% % mg/L mg/L mg/L mg/L ug/L mg/L mg/L	79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0 0.20 20.0 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0			2/26/20 00:02 2/26/20 00:02 2/26/20 00:02 2/25/20 20:24 2/25/20 20:24 2/28/20 04:30 2/26/20 23:30 2/22/20 10:19 2/22/20 10:19 2/22/20 10:19	PDK PDK PDK MBW JWB JAM MBW MBW PAG MBW	К К С С В В С С С І С
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N pH	116 106 109 10 0.108 ND 48.5 ND ND 10.1 ND 6.35	1	% % mg/L mg/L mg/L mg/L ug/L mg/L mg/L mg/L pH_Units	79 - 114 78 - 116 76 - 127 5 0.100 15 2.0 0.20 20.0 0.20 0.20 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0 EPA 300.0 S4500HB-11	2/24/20 09:41	C D	2/26/20 00:02 2/26/20 00:02 2/26/20 00:02 2/25/20 20:24 2/25/20 20:24 2/28/20 04:30 2/26/20 23:30 2/22/20 10:19 2/22/20 10:19 2/22/20 10:19 2/22/20 10:19 2/22/20 10:19 2/25/20 20:24	PDK PDK PDK MBW JWB JAM MBW MBW MBW MBW	К К С С В В С С С С
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N PH Phenolics	116 106 109 10 0.108 ND 48.5 ND 48.5 ND 10.1 ND 6.35 ND	1	% % mg/L mg/L mg/L mg/L ug/L ug/L mg/L pH_Units mg/L	79 - 114 78 - 116 76 - 127 5 5 0.100 15 2.0 0.20 20.0 0.20 0.20 0.20 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0 EPA 300.0 S4500HB-11 EPA 420.4	2/24/20 09:41	C_D	2/26/20 00:02 2/26/20 00:02 2/26/20 00:02 2/25/20 20:24 2/25/20 20:24 2/28/20 04:30 2/26/20 23:30 2/22/20 10:19 2/22/20 10:19 2/22/20 10:19 2/22/20 10:19 2/22/20 10:19 2/22/20 10:19 2/22/20 10:19	PDK PDK PDK MBW JWB JAM MBW PAG MBW MBW MBW C_D	К К С С С В В С С С С С С Ц С С С С Н
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N pH	116 106 109 10 0.108 ND 48.5 ND ND 10.1 ND 6.35	1	% % mg/L mg/L mg/L mg/L ug/L mg/L mg/L mg/L pH_Units	79 - 114 78 - 116 76 - 127 5 0.100 15 2.0 0.20 20.0 0.20 0.20 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0 EPA 300.0 S4500HB-11	2/24/20 09:41	C_D	2/26/20 00:02 2/26/20 00:02 2/26/20 00:02 2/25/20 20:24 2/25/20 20:24 2/28/20 04:30 2/26/20 23:30 2/22/20 10:19 2/22/20 10:19 2/22/20 10:19 2/22/20 10:19 2/22/20 10:19 2/25/20 20:24	PDK PDK PDK MBW JWB JAM MBW MBW MBW MBW MBW MBW MBW	К К С С В В С С С С С С С Н

ALS Environmental Laboratory Locations Across North America





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: 3088001 1ST QTR 2020-3076 RIVER RD

Lab ID: 3088001001 Sample ID: 3076 River Ro	ad, Conestoga, F	2Α			2/21/2020 10:36 2/21/2020 15:43		Matrix: W	/ater	
Parameters	Results Flag	y Units	RDL	Method	Prepared By	у	Analyzed	Ву	Cntr
Total Dissolved Solids	202	mg/L	25	S2540C-11			2/26/20 15:51	D1C	С
Total Organic Carbon (TOC)	ND	mg/L	0.50	SM5310B-2011			2/25/20 00:21	PAG	F
Turbidity	0.25	NTU	0.10	SM2130B-2011			2/22/20 07:38	R2B	С
METALS									
Calcium, Total	14.0	mg/L	0.050	EPA 200.7	2/23/20 16:27 S	хс	2/25/20 13:46	MNP	D1
Calcium, Dissolved	16.0	mg/L	0.10	EPA 200.7	2/24/20 12:26 M	INP	2/26/20 09:54	MNP	E
Iron, Total	ND	mg/L	0.030	EPA 200.7	2/23/20 16:27 S	XC	2/25/20 13:46	MNP	D1
Iron, Dissolved	ND	mg/L	0.060	EPA 200.7	2/24/20 12:26 M	INP	2/26/20 09:54	MNP	E
Magnesium, Total	8.5	mg/L	0.050	EPA 200.7	2/23/20 16:27 S	XC	2/25/20 13:46	MNP	D1
Magnesium, Dissolved	9.3	mg/L	0.10	EPA 200.7	2/24/20 12:26 M	INP	2/26/20 09:54	MNP	E
Manganese, Total	0.16	mg/L	0.0025	EPA 200.7	2/23/20 16:27 S	XC	2/25/20 13:46	MNP	D1
Manganese, Dissolved	0.18	mg/L	0.0050	EPA 200.7	2/24/20 12:26 M	INP	2/26/20 09:54	MNP	E
Potassium, Total	3.1	mg/L	0.25	EPA 200.7	2/23/20 16:27 S	XC	2/25/20 13:46	MNP	D1
Potassium, Dissolved	3.5	mg/L	0.50	EPA 200.7	2/24/20 12:26 M	INP	2/26/20 09:54	MNP	E
Sodium, Total	24.1	mg/L	0.25	EPA 200.7	2/23/20 16:27 S	XC	2/26/20 13:44	MNP	D1
Sodium, Dissolved	25.3	mg/L	0.50	EPA 200.7	2/24/20 12:26 M	INP	2/26/20 09:54	MNP	E
FIELD PARAMETERS									
pH, Field (SM4500B)	5.65	pH_Units		Field			2/21/20 10:36	BGS	Ν
Specific Conductance, Field	324	umhos/cm	1	Field			2/21/20 10:36	BGS	Ν
Temperature	11.20	Deg. C		Field			2/21/20 10:36	BGS	Ν

Susand. Schare

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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: 3088001 1ST QTR 2020-3076 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3088001001	1	3076 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is	s titrate	d to a pH of 4.5 and reported as mg (CaCO3/L.	
3088001001	2	3076 River Road, Conestoga, PA	S4500HB-11	pH
			rs identified as "analyze immediately" ding time when analyzed in the laborat	

3088001001 3 3076 River Road, Conestoga, PA SW846 8260B 4-Bromofluorobenzene

The surrogate 4-Bromofluorobenzene for method SW846 8260B was outside of control limits. The % Recovery was reported as 116 and the control limits were 79 to 114. This result was reported at a dilution of 1.

ALS Environmental Laboratory Locations Across North America





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: 3088001 1ST QTR 2020-3076 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method	
3088001001	3076 River Road, Conestoga, PA	ASTM D6919-09		
3088001001	3076 River Road, Conestoga, PA	EPA 200.7	EPA ACID	
3088001001	3076 River Road, Conestoga, PA	EPA 200.7	EPA TRMD	
3088001001	3076 River Road, Conestoga, PA	EPA 300.0		
3088001001	3076 River Road, Conestoga, PA	EPA 410.4		
3088001001	3076 River Road, Conestoga, PA	EPA 420.4	420.4/9066	
3088001001	3076 River Road, Conestoga, PA	Field		
3088001001	3076 River Road, Conestoga, PA	S2540C-11		
3088001001	3076 River Road, Conestoga, PA	S4500HB-11		
3088001001	3076 River Road, Conestoga, PA	SM2130B-2011		
3088001001	3076 River Road, Conestoga, PA	SM2320B-2011		
3088001001	3076 River Road, Conestoga, PA	SM2510B-2011		
3088001001	3076 River Road, Conestoga, PA	SM5310B-2011		
3088001001	3076 River Road, Conestoga, PA	SW846 8260B		
3088001001	3076 River Road, Conestoga, PA	SW846 9020B		

ALS Environmental Laboratory Locations Across North America

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Client Name: LCSWMA - Brian Sensenich		Containin	AG	AN	AN	99	1	PL 1	PL 5	Ъ	2 rd		5	by Receiving Lab)
Address: 3076 Rover Road		Container	40 ml	125 ml	250 ml	40 ml	1 25	250 ml 12	125 ml 12	125 ml 50	500 ml 50	500 ml Cooler Temp:	3 ThemID:	ş
Conestoga, PA 17516		Preservetive	PCI	H2SO4	H2SO4	Ę	H I	HI HI	HNO3 H	HNO3 N	None N	None No. of Coolers:	viers:	N Initial
Contact: Brian Sensenich					ANAL	YSESIME	ANALYSESIMETHOD REQUESTED	QUESTED					Custody Seals Present?	
Phone#: (717)676-5779					ŗ								(if present) Seals Intact?	-
Project Namel#: LCSWMA - Quarterly		_						N D			110	1000	Received on Ice7	
Bill To: LCSWMA - Brian Sensenich						-		M. 5			00'	COCULA	COCILabels Complete/Accurate?	
app	ess days. urcharges.	-				soos	-	el sis: Ca, Fi		'uw '6w 'e	2' NO3' CI		Cont. In Good Cond.? Correct Containers? Correct Sample Volumes?	
Date Required: Approved by: Email? -Y	۵. ۵	1				8560		eq We	-			OH 'A	Correct Preservation?	
L		_	-	н	>	978		-	Ph		ods	iuile	Headspace/Volatiles?	
Sample	le Time	ll D 10 D* CotsM*	100	0.0	Containers Per Sample or Field Results Balow	r of Contai	Le ners Per Sa	MH NH	eld Result	S Below.	'qi		Courier/Tracking #: Sample/COC Comments	ents
0	1	G DW	N	-	2	37 ×	0	+	4	÷	1	6-1		
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10 Project Comments:	LOGGED	LOGGED BY(signature):					3140		94		s	Standard	Special Processing	State Samples
	REVIEWE	REVIEWED BY(signeture):	ie):				3140		71	Π	etable erable	CLP-like	USACE	Collected In
Relinquished By / Company Name	Date 5-11-2	Date Time	2	Rece	Received By / Company Name	ompany	Vame	000	Date -	Time		JUSACE	Navy	
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99.6	-		9 8					1	1		# OISMd		Special	
														T

ALS

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

F: (717) 944-1430

Condition of Sample Receipt Form

Tracking number: 2. Are Custody Seals on shipping containers intact? 3. Are Custody Seals on sample containers intact? 4. Is there a COC (Chain of-Custody) present? 5. Are the COC and bottle labels complete, legible and in agreement? 5. Are the COC contain sample locations? 7. So Does the COC contain sample tolectors name? 7. So Does the COC contain sample collectors name? 7. So Does the COC contain sample collectors name? 7. So Does the COC contain sample collectors name? 7. So Does the COC note the type(s) of preservation for all bottles? 7. Does the COC note the type(s) of preservation for all bottles? 7. Does the COC note the type of sample, composite or grab? 7. Mere all samples prequiring preservation preserved correctly? 7. Were all samples within holding times for the requested analyses? 7. Were all samples ontainers received intact and headspace free when required? (not broken, leaking, frozen, etc.) 7. Were the samples received on ice? 7. Were all samples received on ice? 7. Were all samples received on ice? 7. Were all samples only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 7. Were all samples received on ice? 7. Were all samples received on ice? 7. Were all samples required for SDWA compliance reporting?	LOSWMA	Work Order #: 3088001 Initials: 3	2/21	2020
2. Are Custody Seals on shipping containers intact? With the search of the second	I. Were airbills / tracking numbers p		N5 YES	NO
3. Are Custody Seals on sample containers intact? WDP YES N 4. Is there a COC (Chain of-Custody) present? WDP YES N 5. Are the COC and bottle labels complete, legible and in agreement? WDP YES N 5. Does the COC contain sample locations? WDP YES N 5. Does the COC contain sample collectors name? WDP N N 5. Does the COC contain date and time of sample collection for all samples? WDP N 5. Does the COC contain sample collectors name? WDP N N 5. Does the COC note the type(s) of preservation for all bottles? WDP N N 5. Does the COC note the number of bottles submitted for each sample? WDP N N 5. Does the COC note the type of sample, composite or grab? WDP N N N N 5. Does the COC note the matrix of the sample(s)?			-	
4. Is there a COC (Chain-of-Custody) present? Image: Complete, legible and in agreement? 5. Are the COC and bottle labels complete, legible and in agreement? Image: Complete, legible and in agreement? 5. Are the COC contain sample locations? Image: Complete, legible and in agreement? Sb. Does the COC contain sample locations? Image: Complete, legible and in agreement? Sb. Does the COC contain sample collectors name? Image: Complete, legible and in agreement? Sc. Does the COC notain sample collectors name? Image: Complete, legible and in agreement? Sc. Does the COC notain sample collectors name? Image: Complete, legible and in agreement? Sc. Does the COC note the type of sample, composite or grab? Image: Complete, legible and in agreement? Sc. Does the COC note the matrix of the sample(s)? Image: Complete, legible analyses Sc. To bes the COC note the matrix of the sample(s)? Image: Complete, legible analyses Sc. Are all samples placed in the proper containers for the requested analyses, with sufficient volume? Image: Complete (Complete analyses) Mere all samples containers received intect and headspace free when required? (not broken, leaking, frozen, etc.) Image: Complete (Complete analyses) Were all samples containers received inte? Image: Complete (Complete analyses) Image: Complete (Complete analyses) Were all samples containers received				NO
5. Are the COC and bottle labels complete, legible and in agreement? The sample collections? Sa. Does the COC contain sample locations? The sample collection for all samples? Sb. Does the COC contain date and time of sample collection for all samples? The sample collectors name? Sc. Does the COC contain by the type(s) of preservation for all bottles? The sample collectors name? Sc. Does the COC note the type(s) of preservation for all bottles? The sample? Sc. Does the COC note the type(s) of preservation or grab? NM Sc. Does the COC note the matrix of the sample(s)? NM Sc. Does the COC note the matrix of the sample(s)? NM Sc. Are all aqueous samples requiring preservation preserved correctly? N/A Netre all samples placed in the proper containers for the requested analyses, with sufficient volume? N/A Sc. Are all samples ontainers for the requested analyses? N/A The sample sittin holding times for the requested analyses? Sc. Were all sample containers received intext and headspace free when required? (not broken, leaking, frozen, etc.) The sample sittin holding times for the requested solut event and for the sample sittin holding times measured at 0.0-6.0°C The samples plate is apples plate and to 0.0-6.0°C 3. Are the samples required for SDWA compliance reporting? N/A YES N/A Yees angle temperatur			/	NO
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Sb. Does the COC contain date and time of sample collection for all samples? (TE) Sc. Does the COC contain sample collectors name? (TE) Sd. Does the COC note the type(s) of preservation for all bottles? (TE) Se. Does the COC note the type of sample, composite or grab? (TE) Sg. Does the COC note the type of sample, composite or grab? (TE) Sg. Does the COC note the type of sample, composite or grab? (TE) Sy. Does the COC note the matrix of the sample(s)? (TE) S. Are all aqueous samples requiring preservation preserved corrective? N/A Were all samples placed in the proper containers for the requested analyses, with sufficient volume? (TE) Sy. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) (TE) N/A (TE) (TE) N/Were the samples received on ice? (TE) (TE) N/Were the samples received on ice? (TE) (TE) N/Were the samples required for SDWA compliance reporting? (N/A (TE) N/Were samples required for SDWA compliance reporting? N/A (TE) (N/A YES (TE) (TE) (TE) (N/A (TE) (N/A YES (TE				NO
Sc. Does the COC contain sample collectors name? Yiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii				NO
5d. Does the COC note the type(s) of preservation for all bottles? YE 5e. Does the COC note the number of bottles submitted for each sample? YE 5f. Does the COC note the number of bottles submitted for each sample? YE 5g. Does the COC note the type of sample, composite or grab? YE 5g. Does the COC note the matrix of the sample(s)? YE 5. Are all aqueous samples requiring preservation preserved correctly? N/A 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? YE 8. Are all samples only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? YE 9. Were all samples received on ice? YE 1. Were the samples received on ice? YE 2. Were sample temperatures measured at 0.0-6.0°C YE 3. Are the samples required for SDWA compliance reporting? N/A 13a. Are the samples required for SDWA compliance reporting? N/A 13b. Did the client provide a SDWA PWS ID#? N/A 13c. Are all aqueous unpreserved SDWA sample type (D, E, R, C, P, S)? N/A 13a. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A 13a. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES N/A Y				NO
Se. Does the COC note the number of bottles submitted for each sample? YE Sf. Does the COC note the type of sample, composite or grab? YE Sg. Does the COC note the matrix of the sample(s)? YE So. Are all aqueous samples requiring preservation preserved correctly? ³ N/A YE N/A S. Are all samples placed in the proper containers for the requested analyses, with sufficient volume? YE S. Are all samples containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) YE O. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? YE YE YE YE YE Are the samples required for SDWA compliance reporting? N/A YE N/				NO
5f. Does the COC note the type of sample, composite or grab? (YE) NM 5g. Does the COC note the matrix of the sample(s)? (YE) NM 6. Are all aqueous samples requiring preservation preserved correctly? N/A (YE) NM 7. Were all samples placed in the proper containers for the requested analyses? 1.3 (YE) NM 8. Are all samples ontainers received intact and headspace free when required? (not broken, leaking, frozen, etc.) (YE) NK 9. Were all sample containers received on ice? (YE) (YE) NK 9. Were the samples required on ice? (YE) (YE) NK 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? (YE) NK 11. Were the samples required for SDWA compliance reporting? (NA) (YE) NK 12. Were sample temperatures measured at 0.0-6.0°C (YE) (YE) NK 13. Are the samples required for SDWA compliance reporting? N/A YES NK 13. Are the samples required for SDWA compliance reporting? N/A YES NK 13. Are the samples required for SDWA samples pH 5.9? N/A YES NK 13. Did the client provide the SDWA sample type (D, E, R, C, P,				NO
5g. Does the COC note the matrix of the sample(s)? ITB N/A 5. Are all aqueous samples requiring preservation preserved correctly? N/A ITB N/A 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? ITB N/A ITB N/A 8. Are all samples within holding times for the requested analyses? D 13 Component of the sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) ITB N/A 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) ITB N/A 0. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? ITB N/D 1. Were the samples received on ice? ITB N/A 2. Were sample temperatures measured at 0.0-6.0°C ITB N/A 3. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below ITB N/A 13a. Are the samples required for SDWA compliance reporting? N/A YES N/A 13b. Did the client provide a SDWA PWS ID#? N/A YES N/A 13d. Did the client provide the SDWA sample by (D, E, R, C, P, S)? N/A YES N/A 13e. Did the				NO
5. Are all aqueous samples requiring preservation preserved correctly? N/A (TE) N/A 7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? (TE) N/A 8. Are all samples within holding times for the requested analyses? (D) (TE) N/A 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) (YE) N/A 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? (N/A) YES N/A 11. Were the samples received on ice? (YE) (YE) N/A YES N/A 2. Were sample temperatures measured at 0.0-6.0°C (YE) (YE) N/A YES N/A 3. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below (YE) N/A YES N/A 13b. Did the client provide a SDWA PWS ID#? N/A YES N/A YES N/A 13c. Are all aqueous unpreserved SDWA samples pH 5-9? N/A YES N/A YES N/A 13c. Are all aqueous unpreserved SDWA sample type (D, E, R, C, P, S)? N/A YES N/A YES N/A 13e. Did the client provide the				NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? YES NIX 8. Are all samples within holding times for the requested analyses? YES NIX YES NIX 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) YES NIX 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? YES NIX 11. Were the samples received on ice? YES YES NIX 12. Were sample temperatures measured at 0.0-6.0°C YES NIX 13. Are the samples required for SDWA compliance reporting? N/A YES NIX 13a. Are the samples required for SDWA compliance reporting? N/A YES NIX 13b. Did the client provide a SDWA PWS ID#? N/A YES NIX 13c. Are all aqueous unpreserved SDWA sample pet 5.9? N/A YES NIX 13e. Did the client provide the SDWA sample location ID/Description? N/A YES NIX 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES NIX YES NIX YES NIX YES NIX YeS <td< td=""><td></td><td></td><td></td><td>NO</td></td<>				NO
8. Are all samples within holding times for the requested analyses? Yes NS Yes NS 9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.) Yes NK 10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? Yes NK 11. Were the samples received on ice? Yes NK 12. Were sample temperatures measured at 0.0-6.0°C Yes NK 13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below Yes NK 13a. Are the samples required for SDWA compliance reporting? N/A YES NK 13b. Did the client provide a SDWA PWS ID#? N/A YES NK 13d. Did the client provide the SDWA sample location ID/Description? N/A YES NK 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES NK N/A YES NK YES NK N/A YES NK YES NK N/A YES NK N/A YES NK N/A YES NK N/A YES NK N/A<				
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)	8. Are all samples within holding time	es for the requested analyses? Ph 13 percet SUA	VEC	1 7.
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? WTD YES NC 11. Were the samples received on ice? YES NC YES NC 12. Were sample temperatures measured at 0.0-6.0°C YES NC YES NC 13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below YES NC 13a. Are the samples required for SDWA compliance reporting? N/A YES NC 13b. Did the client provide a SDWA PWS ID#? N/A YES NC 13c. Are all aqueous unpreserved SDWA samples pH 5-9? N/A YES NC 13d. Did the client provide the SDWA sample location ID/Description? N/A YES NC 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES NC VA YES NC N/A YES NC 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES NC VA YES NC N/A YES NC I3e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? YES NC Valore f*:				1 1 Com
1. Were the samples received on ice? YES NC 2. Were sample temperatures measured at 0.0-6.0°C YES NC 3. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below. YES NC 13a. Are the samples required for SDWA compliance reporting? N/A YES NC 13b. Did the client provide a SDWA PWS ID#? N/A YES NC 13c. Are all aqueous unpreserved SDWA samples pH 5-9? N/A YES NC 13d. Did the client provide the SDWA sample location ID/Description? N/A YES NC 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES NC Version N/A YES NC N/A YES NC N/A YES NC I Be. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES NC Temperature (°C): 3 3 3 3				
2. Were sample temperatures measured at 0.0-6.0°C				
3. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below				10.2
13a. Are the samples required for SDWA compliance reporting? N/A YES N/A 13b. Did the client provide a SDWA PWS ID#? N/A YES N/A 13c. Are all aqueous unpreserved SDWA samples pH 5-9? N/A YES N/A 13d. Did the client provide the SDWA sample location ID/Description? N/A YES N/A 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES N/A VES N/A YES N/A YES N/A I 3e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES N/A Ves N/A YES N/A YES N/A Temperature (°C): 3				
13b. Did the client provide a SDWA PWS ID#? N/A YES N/A 13c. Are all aqueous unpreserved SDWA samples pH 5-9? N/A YES N/A 13d. Did the client provide the SDWA sample location ID/Description? N/A YES N/A 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES N/A VES N/A YES N/C N/A YES N/A YES N/C I 3e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES N/C Cooler #:				1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
13c. Are all aqueous unpreserved SDWA samples pH 5-9? N/A YES N/A 13d. Did the client provide the SDWA sample location ID/Description? N/A YES N/A 13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)? N/A YES N/A Cooler #:				NO
13d. Did the client provide the SDWA sample location ID/Description?		the second se	and the second second	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?			1	NO
Temperature (°C): 3				NO
	Cooler #:		_	
Thermometer ID: 407	Temperature (°C): 3			
	Thermometer ID: 40	1	_	
Radiological (µCi):	Radiological (pCi):			







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

March 2, 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:	3088007
Purchase Order:	PO1000126	Workorder ID:	1ST QTR 2020 3079 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, February 21, 2020.

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

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

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

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

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

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

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

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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: 3088007 1ST QTR 2020 3079 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3088007001	3079RIVERRD	Water	2/21/2020 13:00	2/21/2020 15:43	Mr. Brian G Shade

ALS Environmental Laboratory Locations Across North America





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SAMPLE SUMMARY

Workorder: 3088007 1ST 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.

Environmental

- -- 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

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ANALYTICAL RESULTS

Workorder: 3088007 1ST QTR 2020 3079 RIVER RD

Lab ID: 3088007001 Sample ID: 3079RIVERRD	1					2/21/2020 13: 2/21/2020 15:		Matrix: V	Vater	
Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
WET CHEMISTRY										
Alkalinity, Bicarbonate	36		mg/L	5	SM2320B-2011			2/25/20 20:24	MBW	С
Alkalinity, Total	36	1	mg/L	5	SM2320B-2011			2/25/20 20:24	MBW	С
Ammonia-N	0.101		mg/L	0.100	ASTM D6919-09			2/28/20 06:20	JWB	В
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			2/27/20 01:30	JAM	В
Chloride	33.4		mg/L	2.0	EPA 300.0			2/22/20 12:01	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			2/22/20 12:01	MBW	С
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			2/25/20 15:05	PAG	I
Nitrate-N	ND		mg/L	0.20	EPA 300.0			2/22/20 12:01	MBW	-
Nitrite-N	ND		mg/L	0.20	EPA 300.0			2/22/20 12:01	MBW	С
рН	6.90	2	pH_Units		S4500HB-11			2/25/20 20:24	MBW	С
Phenolics	ND		mg/L	0.005	EPA 420.4	2/24/20 09:41	C_D	2/26/20 05:48	C_D	Н
Specific Conductance	187		umhos/cm	1	SM2510B-2011			2/25/20 20:24	MBW	С
Sulfate	11.9		mg/L	2.0	EPA 300.0			2/22/20 12:01	MBW	С
Total Dissolved Solids	56		mg/L	25	S2540C-11			2/26/20 15:51	D1C	С
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			2/25/20 04:59	PAG	F
Turbidity	ND		NTU	0.10	SM2130B-2011			2/22/20 07:38	R2B	С
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			2/26/20 15:10	DPC	К
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 15:10	DPC	К
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 15:10	DPC	К
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 15:10	DPC	К
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 15:10	DPC	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 15:10	DPC	К
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/26/20 15:10	DPC	К
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/26/20 15:10		K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 15:10	DPC	К
Toluene	ND		ug/L	1.0	SW846 8260B			2/26/20 15:10	DPC	К
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/26/20 15:10	DPC	К
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 15:10	DPC	ĸ
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 15:10	DPC	ĸ
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			2/26/20 15:10	DPC	ĸ
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/26/20 15:10	DPC	К
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	109		%	62 - 133	SW846 8260B			2/26/20 15:10	DPC	К

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ANALYTICAL RESULTS

Workorder: 3088007 1ST QTR 2020 3079 RIVER RD

Lab ID: 3088007001 Sample ID: 3079RIVERRD						2/21/2020 13:00 2/21/2020 15:43	-	Matrix: W	/ater	
Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
4-Bromofluorobenzene (S)	107		%	79 - 114	SW846 8260B			2/26/20 15:10	DPC	К
Dibromofluoromethane (S)	97		%	78 - 116	SW846 8260B			2/26/20 15:10	DPC	К
Toluene-d8 (S)	102		%	76 - 127	SW846 8260B			2/26/20 15:10	DPC	К
METALS										
Calcium, Total	9.2		mg/L	0.050	EPA 200.7	2/25/20 16:14	SXC	2/26/20 14:29	MNP	D1
Calcium, Dissolved	10.6		mg/L	0.10	EPA 200.7	2/24/20 12:26	MNP	2/26/20 10:20	MNP	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	2/25/20 16:14	SXC	2/26/20 14:29	MNP	D1
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	2/24/20 12:26	MNP	2/26/20 10:20	MNP	E
Magnesium, Total	5.2		mg/L	0.050	EPA 200.7	2/25/20 16:14	SXC	2/26/20 14:29	MNP	D1
Magnesium, Dissolved	6.0		mg/L	0.10	EPA 200.7	2/24/20 12:26	MNP	2/26/20 10:20	MNP	E
Manganese, Total	0.15		mg/L	0.0025	EPA 200.7	2/25/20 16:14	SXC	2/26/20 14:29	MNP	D1
Manganese, Dissolved	0.16		mg/L	0.0050	EPA 200.7	2/24/20 12:26	MNP	2/26/20 10:20	MNP	E
Potassium, Total	1.6		mg/L	0.25	EPA 200.7	2/25/20 16:14	SXC	2/26/20 14:29	MNP	D1
Potassium, Dissolved	1.7		mg/L	0.50	EPA 200.7	2/24/20 12:26	MNP	2/26/20 10:20	MNP	E
Sodium, Total	14.0		mg/L	0.25	EPA 200.7	2/25/20 16:14	SXC	2/26/20 14:29	MNP	D1
Sodium, Dissolved	14.0		mg/L	0.50	EPA 200.7	2/24/20 12:26	MNP	2/26/20 10:20	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	5.73		pH_Units		Field			2/21/20 13:00	BGS	
Specific Conductance, Field	211		umhos/cm	1	Field			2/21/20 13:00	BGS	
Temperature	13.40		Deg. C		Field			2/21/20 13:00	BGS	

Susand. Schare

Ms. Susan J Scherer Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3088007 1ST QTR 2020 3079 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3088007001	1	3079RIVERRD	SM2320B-2011	Alkalinity, Total
The Total Alkalinit	ty is titrate	ed to a pH of 4.5 and repor	ted as mg CaCO3/L.	
3088007001	2	3079RIVERRD	S4500HB-11	рН
			. Parameters identified as "analyze immed	liately" require analysis within 15 minutes of

collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3088007 1ST QTR 2020 3079 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3088007001	3079RIVERRD	ASTM D6919-09	
3088007001	3079RIVERRD	EPA 200.7	EPA ACID
3088007001	3079RIVERRD	EPA 200.7	EPA TRMD
3088007001	3079RIVERRD	EPA 300.0	
3088007001	3079RIVERRD	EPA 410.4	
3088007001	3079RIVERRD	EPA 420.4	420.4/9066
3088007001	3079RIVERRD	Field	
3088007001	3079RIVERRD	S2540C-11	
3088007001	3079RIVERRD	S4500HB-11	
3088007001	3079RIVERRD	SM2130B-2011	
3088007001	3079RIVERRD	SM2320B-2011	
3088007001	3079RIVERRD	SM2510B-2011	
3088007001	3079RIVERRD	SM5310B-2011	
3088007001	3079RIVERRD	SW846 8260B	
3088007001	3079RIVERRD	SW846 9020B	

ALS Environmental Laboratory Locations Across North America

· · · · · · · · · · · · · · · · · · ·	H (500 ml 500 ml Cooler Temp: 0 Therm ID:	None None No. of Coolers: Y	Custody Seals Present?	(il pres		COCILEBER	Correct Containers?	ह १८०३	н ^{у,} н	HandspeceVolatilies?	A							11	ALS Field Services: DPickup ULabor DComposite_Sampling DRental_Equipment	Clother:	Standard Special P	5	0	0	able to PADEP? Sample Disposa	Voe Lab X	-
ŀ	ц,	nl 125 ml	GONH 5		_	eŅ	۲, K, I	'uw 'by	, Fe, M	'8') ::	eN elais	esult							+	_		3111	3 11	ite Time	Surge -			
L	FL	mi 125 ml	D4 HNO3	ESTED	10	W '6	e, M	A ,60 :	-		loss	ple or Field	-		-		-	-	+	-	-			, Date	12/200		-	
	JI DI	- 250 ml	- H2SO4	ANALYSESIMETHOD REQUESTED		-	-	_	0	00'		s Per Sam	-	-	0.20	-	-	÷	-	_		<u>CAIE</u>	VIND	ne	2			
	1	F	-	SIMETH	-	-			~ ~		-	Containers	×	-	12/12/	-			-	-				Received By / Company Name				
	oc ce	M 40 m	O4 HCI	ANALYSI	-		-	5.	OA 0	9687	_	umber of	2 32	3	2	-			-		1			By / Com				
	AN AN	mi 250 mi	OH H2SO4		i i i	-	-		-2	÷	X	1.1		-	-	+	1							Seceived	1			
	AN SN	mi 125 mi	H12SO4		-	-			_	-	HO	0	0	+	+										K	1		
	AG	10 ml	Ha HCI			-		-	-		-	new	-	_	ŀ	-			1			ture):	hature):	Time	15432	4	ł	9
	Construct	Container	Preservation	-		F		-	_	1	c	JO Đ.	C		-				1.1			LOGGED BY (signature):	REVIEWED BY(signature):		-20 15			_
								s days.				Time	-	-					4		_	LOGGEL	REVIEW	Date	2-21-20			
and a state of the	MA	24				Co.		12 busines:	Approved By:			Sample	UCHCICU	241410										me	Se			
301 FURING MUR ROAD + Middletown, PA / 1001 + 111.944 3041 + FBX 111.344,144	Client Name: Lancaster County Solid Waste MA	Address: 1299 Harrisburg Pike, P.O. Box 4424	l ancester PA 17604	Contact: Dan Brown		Project Name/#: LCSWMA - Quarterly Fire Co.	Bill To: Lancaster County Solid Waste MA	\ge	Date Required: ALS approved and sortionary and Date Required:		Fax?	Sample Description/Location	1 3079RIVERRD	0		4	2	9	80	6	10	Project Comments:		Relincuished Bv ACompany Name	1 12 ON MOUNDEN AL		2	

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

Condition of Sample Receipt Form

I. Were airbills / tracking numbers present and recorded? Tracking number:	MORS	YES	
2. Are Custody Seals on shipping containers intact?		110	NO
3. Are Custody Seals on sample containers intact?			
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
		YES	NO
		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	NO
5. Are the COC and bottle labels complete, legible and in agreement?			NO
Sa. Does the COC contain sample locations?			NO
Sb. Does the COC contain date and time of sample collection for all samples?		~ /	NO
5c. Does the COC contain sample collectors name?			NO
5d. Does the COC note the type(s) of preservation for all bottles?			NO
Se. Does the COC note the number of bottles submitted for each sample?			NO
5f. Does the COC note the type of sample, composite or grab?		~ /	NO
5g. Does the COC note the matrix of the sample(s)?			NO
. Are all aqueous samples requiring preservation preserved correctly? ¹		TES	NO
. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?			1.22
Are all samples within holding times for the requested analyses? Ph 13 0000-yea			(NO
Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc			NO
0. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?		YES	10.2
1. Were the samples received on ice?		TES	NO
2. Were sample temperatures measured at 0.0-6.0°C			NO
3. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below			
13a. Are the samples required for SDWA compliance reporting?		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	NO
13b. Did the client provide a SDWA PWS ID#?	and the second	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?		YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	1	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?		YES	NO
Cooler #:			
Temperature (°C):			
Thermometer ID: 식기			
Radiological (µCl):			

Monday, March 02, 2020 6:53:01 AM







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

March 2, 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:	3088002
Purchase Order:	PO1000126	Workorder ID:	1ST QTR 2020-3088 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, February 21, 2020.

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

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

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

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

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

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

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

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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: 3088002 1ST QTR 2020-3088 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3088002001	3088 River Road, Conestoga PA	Water	2/21/2020 13:18	2/21/2020 15:43	Mr. Brian G Shade

ALS Environmental Laboratory Locations Across North America



LS) 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: 3088002 1ST 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 Laboratory Locations Across North America





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: 3088002 1ST QTR 2020-3088 RIVER RD

Lab ID: 3088002001 Sample ID: 3088 River Ro	oad, Conest	oga PA			Date Collected: Date Received:			Matrix: \	Vater	
Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:25	PDK	К
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 00:25	PDK	К
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 00:25	PDK	К
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:25	PDK	К
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:25	PDK	К
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:25	PDK	К
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:25	PDK	К
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/26/20 00:25	PDK	К
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:25	PDK	К
Toluene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:25	PDK	К
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/26/20 00:25	PDK	К
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 00:25	PDK	К
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 00:25	PDK	К
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			2/26/20 00:25	PDK	К
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/26/20 00:25	PDK	к
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
										17
1,2-Dichloroethane-d4 (S)	115		%	62 - 133	SW846 8260B			2/26/20 00:25	PDK	К
1,2-Dichloroethane-d4 (S) 4-Bromofluorobenzene (S)	115 117	3	% %	62 - 133 79 - 114	SW846 8260B SW846 8260B			2/26/20 00:25 2/26/20 00:25	PDK PDK	к К
	-	3								
4-Bromofluorobenzene (S)	117	3	%	79 - 114	SW846 8260B			2/26/20 00:25	PDK	К
4-Bromofluorobenzene (S) Dibromofluoromethane (S)	117 109	3	% %	79 - 114 78 - 116	SW846 8260B SW846 8260B			2/26/20 00:25 2/26/20 00:25	PDK PDK	K K
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S)	117 109	3	% %	79 - 114 78 - 116	SW846 8260B SW846 8260B			2/26/20 00:25 2/26/20 00:25	PDK PDK PDK	к к к
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY	117 109 111	3	% % %	79 - 114 78 - 116 76 - 127	SW846 8260B SW846 8260B SW846 8260B			2/26/20 00:25 2/26/20 00:25 2/26/20 00:25	PDK PDK PDK MBW	к к к
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate	117 109 111 152		% % % mg/L	79 - 114 78 - 116 76 - 127 5	SW846 8260B SW846 8260B SW846 8260B SW846 8260B			2/26/20 00:25 2/26/20 00:25 2/26/20 00:25 2/25/20 20:24	PDK PDK PDK MBW	к к с
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand	117 109 111 152 152		% % % mg/L mg/L	79 - 114 78 - 116 76 - 127 5 5	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011			2/26/20 00:25 2/26/20 00:25 2/26/20 00:25 2/25/20 20:24 2/25/20 20:24	PDK PDK PDK MBW MBW	к к с с
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Armonia-N	117 109 111 152 152 ND		% % mg/L mg/L mg/L	79 - 114 78 - 116 76 - 127 5 5 0.100	SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09			2/26/20 00:25 2/26/20 00:25 2/26/20 00:25 2/25/20 20:24 2/25/20 20:24 2/25/20 04:16	PDK PDK PDK MBW MBW JWB JAM	К К С С В В
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD)	117 109 111 152 152 ND ND		% % mg/L mg/L mg/L mg/L	79 - 114 78 - 116 76 - 127 5 5 0.100 15	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4			2/26/20 00:25 2/26/20 00:25 2/26/20 00:25 2/25/20 20:24 2/25/20 20:24 2/28/20 04:16 2/26/20 23:30	PDK PDK PDK MBW MBW JWB JAM	К К С С В В С
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride	117 109 111 152 152 ND ND 243		% % mg/L mg/L mg/L mg/L	79 - 114 78 - 116 76 - 127 5 5 0.100 15 5.0	SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0			2/26/20 00:25 2/26/20 00:25 2/26/20 00:25 2/25/20 20:24 2/25/20 20:24 2/28/20 04:16 2/26/20 23:30 2/25/20 12:00	PDK PDK PDK MBW JWB JWB JAM	К К С С В В С
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic	117 109 111 152 152 ND ND 243 ND		% % mg/L mg/L mg/L mg/L mg/L	79 - 114 78 - 116 76 - 127 5 5 0.100 15 5.0 0.20	SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0			2/26/20 00:25 2/26/20 00:25 2/26/20 00:25 2/25/20 20:24 2/25/20 20:24 2/28/20 04:16 2/26/20 23:30 2/25/20 12:00 2/22/20 10:36	PDK PDK PDK MBW JWB JAM MBW MBW	К К С С В В С С С І
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX)	117 109 111 152 152 ND ND 243 ND ND		% % mg/L mg/L mg/L mg/L mg/L ug/L	79 - 114 78 - 116 76 - 127 5 5 0.100 15 5.0 0.20 20.0	SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B			2/26/20 00:25 2/26/20 00:25 2/26/20 00:25 2/25/20 20:24 2/25/20 20:24 2/28/20 04:16 2/26/20 23:30 2/25/20 12:00 2/22/20 10:36 2/24/20 15:11	PDK PDK PDK MBW JWB JAM MBW MBW PAG MBW	К К С С В В С С С І С
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N	117 109 111 152 152 ND ND 243 ND ND 6.6		% % mg/L mg/L mg/L mg/L ug/L mg/L mg/L	79 - 114 78 - 116 76 - 127 5 5 0.100 15 5.0 0.20 20.0 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0			2/26/20 00:25 2/26/20 00:25 2/26/20 00:25 2/25/20 20:24 2/25/20 20:24 2/28/20 04:16 2/26/20 23:30 2/25/20 12:00 2/22/20 10:36 2/24/20 15:11 2/22/20 10:36	PDK PDK MBW JWB JAM MBW MBW PAG MBW	К К С С В В С С С І С С
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N pH	117 109 111 152 152 ND ND 243 ND 243 ND ND 6.6 ND 7.75	1	% % mg/L mg/L mg/L mg/L ug/L mg/L mg/L mg/L pH_Units	79 - 114 78 - 116 76 - 127 5 0.100 15 5.0 0.20 20.0 0.20 0.20 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0 EPA 300.0 S4500HB-11	2/24/20 09:41	C D	2/26/20 00:25 2/26/20 00:25 2/26/20 00:25 2/25/20 20:24 2/25/20 20:24 2/28/20 04:16 2/26/20 23:30 2/25/20 12:00 2/22/20 10:36 2/22/20 10:36 2/22/20 10:36 2/25/20 20:24	PDK PDK PDK MBW JWB JAM MBW MBW MBW MBW	К К С С В В С С С С
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N PH Phenolics	117 109 111 152 152 ND ND 243 ND 243 ND ND 6.6 ND 7.75 ND	1	% % mg/L mg/L mg/L mg/L ug/L ug/L mg/L pH_Units mg/L	79 - 114 78 - 116 76 - 127 5 5 0.100 15 5.0 0.20 20.0 0.20 0.20 0.20 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0 EPA 300.0 S4500HB-11 EPA 420.4	2/24/20 09:41	C_D	2/26/20 00:25 2/26/20 00:25 2/26/20 00:25 2/25/20 20:24 2/25/20 20:24 2/28/20 04:16 2/26/20 23:30 2/25/20 12:00 2/22/20 10:36 2/22/20 10:36 2/22/20 10:36 2/22/20 10:36 2/25/20 20:24 2/26/20 05:48	PDK PDK PDK MBW JWB JAM MBW PAG MBW MBW MBW C_D	К К С С С В В С С С С С С Ц С С С С Н
4-Bromofluorobenzene (S) Dibromofluoromethane (S) Toluene-d8 (S) WET CHEMISTRY Alkalinity, Bicarbonate Alkalinity, Total Ammonia-N Chemical Oxygen Demand (COD) Chloride Fluoride Halogen, Total Organic (TOX) Nitrate-N Nitrite-N pH	117 109 111 152 152 ND ND 243 ND 243 ND ND 6.6 ND 7.75	1	% % mg/L mg/L mg/L mg/L ug/L mg/L mg/L mg/L pH_Units	79 - 114 78 - 116 76 - 127 5 0.100 15 5.0 0.20 20.0 0.20 0.20 0.20	SW846 8260B SW846 8260B SW846 8260B SW846 8260B SM2320B-2011 ASTM D6919-09 EPA 410.4 EPA 300.0 EPA 300.0 SW846 9020B EPA 300.0 EPA 300.0 S4500HB-11	2/24/20 09:41	C_D	2/26/20 00:25 2/26/20 00:25 2/26/20 00:25 2/25/20 20:24 2/25/20 20:24 2/28/20 04:16 2/26/20 23:30 2/25/20 12:00 2/22/20 10:36 2/22/20 10:36 2/22/20 10:36 2/25/20 20:24	PDK PDK MBW JWB JAM MBW MBW MBW MBW MBW MBW MBW	К К С С В В С С С С С С С Н

ALS Environmental Laboratory Locations Across North America





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: 3088002 1ST QTR 2020-3088 RIVER RD

Lab ID: 3088002001 Sample ID: 3088 River Ro	ad, Conestoga F	A			2/21/2020 13:18 2/21/2020 15:43	Matrix: V	later	
Parameters	Results Flag	g Units	RDL	Method	Prepared By	Analyzed	By Cntr	
Total Dissolved Solids	502	mg/L	25	S2540C-11		2/26/20 15:51	D1C C	
Total Organic Carbon (TOC)	ND	mg/L	0.50	SM5310B-2011		2/25/20 00:21	PAG F	
Turbidity	ND	NTU	0.10	SM2130B-2011		2/22/20 07:38	R2B C	
METALS								
Calcium, Total	0.10	mg/L	0.050	EPA 200.7	2/23/20 16:27 SX	2/25/20 13:49	MNP D1	
Calcium, Dissolved	0.30	mg/L	0.10	EPA 200.7	2/24/20 12:26 MN	2/26/20 09:57	MNP E	
Iron, Total	ND	mg/L	0.030	EPA 200.7	2/23/20 16:27 SX	2/25/20 13:49	MNP D1	
Iron, Dissolved	ND	mg/L	0.060	EPA 200.7	2/24/20 12:26 MN	P 2/26/20 09:57	MNP E	
Magnesium, Total	0.062	mg/L	0.050	EPA 200.7	2/23/20 16:27 SX	2/25/20 13:49	MNP D1	
Magnesium, Dissolved	0.12	mg/L	0.10	EPA 200.7	2/24/20 12:26 MN	P 2/26/20 09:57	MNP E	
Manganese, Total	ND	mg/L	0.0025	EPA 200.7	2/23/20 16:27 SX	2/25/20 13:49	MNP D1	
Manganese, Dissolved	ND	mg/L	0.0050	EPA 200.7	2/24/20 12:26 MN	P 2/26/20 09:57	MNP E	
Potassium, Total	2.5	mg/L	0.25	EPA 200.7	2/23/20 16:27 SX	2/25/20 13:49	MNP D1	
Potassium, Dissolved	2.6	mg/L	0.50	EPA 200.7	2/24/20 12:26 MN	P 2/26/20 09:57	MNP E	
Sodium, Total	255	mg/L	0.25	EPA 200.7	2/23/20 16:27 SX	2/26/20 13:47	MNP D1	
Sodium, Dissolved	224	mg/L	0.50	EPA 200.7	2/24/20 12:26 MN	P 2/26/20 09:57	MNP E	
FIELD PARAMETERS								
pH, Field (SM4500B)	6.54	pH_Units		Field		2/21/20 13:18	BGS N	
Specific Conductance, Field	1076	umhos/cm	1	Field		2/21/20 13:18	BGS N	
Temperature	14.50	Deg. C		Field		2/21/20 13:18	BGS N	

Susand. Schare

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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: 3088002 1ST QTR 2020-3088 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte						
3088002001	1	3088 River Road, Conestoga PA	SM2320B-2011	Alkalinity, Total						
The Total Alkalinity is	The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.									
3088002001	2	3088 River Road, Conestoga PA	S4500HB-11	pH						
			rs identified as "analyze immediately" ding time when analyzed in the laborat							

3088002001 3 3088 River Road, Conestoga PA SW846 8260B 4-Bromofluorobenzene

The surrogate 4-Bromofluorobenzene for method SW846 8260B was outside of control limits. The % Recovery was reported as 117 and the control limits were 79 to 114. This result was reported at a dilution of 1.

ALS Environmental Laboratory Locations Across North America





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: 3088002 1ST QTR 2020-3088 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3088002001	3088 River Road, Conestoga PA	ASTM D6919-09	
3088002001	3088 River Road, Conestoga PA	EPA 200.7	EPA ACID
3088002001	3088 River Road, Conestoga PA	EPA 200.7	EPA TRMD
3088002001	3088 River Road, Conestoga PA	EPA 300.0	
3088002001	3088 River Road, Conestoga PA	EPA 410.4	
3088002001	3088 River Road, Conestoga PA	EPA 420.4	420.4/9066
3088002001	3088 River Road, Conestoga PA	Field	
3088002001	3088 River Road, Conestoga PA	S2540C-11	
3088002001	3088 River Road, Conestoga PA	S4500HB-11	
3088002001	3088 River Road, Conestoga PA	SM2130B-2011	
3088002001	3088 River Road, Conestoga PA	SM2320B-2011	
3088002001	3088 River Road, Conestoga PA	SM2510B-2011	
3088002001	3088 River Road, Conestoga PA	SM5310B-2011	
3088002001	3088 River Road, Conestoga PA	SW846 8260B	
3088002001	3088 River Road, Conestoga PA	SW846 9020B	

ALS Environmental Laboratory Locations Across North America

ju Operandium - muterian, javi 1921. • Nuro 117 dus 131. • faz. 117 dus 140. • faz. 717. gd.d. 1830. *14. Discoversed state + Middielinam, Pa. 17057 • 717. gd.d. 5541 • F.Faz. 717. gd.d. 1830.	· Fax 717.94	1430	A	ALL SHADI	DED AK SAMPL	ED AREAS MUST BE COMPLETED BY THE CLIENT SAMPLER. INSTRUCTIONS ON THE BACK.	RUCTIO	NS ON T	ED BY TI HE BAC	te cule. K		-			-
Client Name: LCSWMA - Hans Weber and Deb Kalbach	albach	-	Container	AG.	AN	AN	8		μ	Я	æ	PL /	0 5 *	38002*	/ Receiving Lab)
Address: 3088 River Road			Container	40 ml	125 ml	250 ml	40 ml	Ĩ.	250 ml	125 ml	125 ml	500 ml	500 ml Cooler	Cooter Temp: 5 Therm ID:	Low 3
Conestoga, PA 17516		1 e	Preservative	HCI	H2SO4	HZSOA	Ę	ī	H2SOM	EONH	EONH	None	None No. of Coolers:	polers:	V Initial
Contact: Hans Weber and Deb Kalbach						ANA	LYSES/M	ETHOD R	ANAL YSESIMETHOD REQUESTED	0			Π	Custody Seals Present?	
Phone#: (717) 419-7982										'u	-			(if present) Seals Intact?	
Project Name/#: LCSWMA - Quarterly	ľ									w '6	e	'J'7		Received on Ice?	
Bill To: LCSWMA - Hans Weber and Deb Kalbach			_							iw 'a	K' 4	os	COCIL	COCILabets Complete/Accurate?	
TAT X Normal-Standard TAT is 10-12 business days. Rush-Subject to ALS approval and surcharges. Date Regulated: Approved By:	siness day d surcharg ed By:	is.					SOCs			etals: Ca, Fe	,nM ,eM ,a ³	DS' NO3' CI		Cont. In Good Cond.? Correct Containers? Correct Sample Volsmes?	
					1		928-9		000 '	M be/	'eŋ :		H 'AI	Correct Preservation?	
Fax? 7-Y No::			_	-	н	x	968		N-E	en	:spe)	ds ab	inils	HeadspaceNolatiles?	
Sample Description/Location Sam (as It will appear on the lab report) Da	Sample Date 1	Time	*G or I	100	2-0	다 이 중 훈 포 포 성 · · · · · · · · · · · · · · · · ·	er of Cont	A ainers Per	Sample or	Field Resi	Me Melow	Hd		Courter/Tracking #: Sample/COC Comments	nents
1 3088RIVER RD 02/2	02/21/20	1318	G DW	2	Ŧ	2	22	×	- 1-	-	-	-	-		
					il		47.					1			
	-						ah	mater					_		Ĩ
	1														
	51			21											
8					1										
6													ALS	ALS Field Services: DPI	DRental Equipment
10]								Dother:		
Project Comments:	ğ	LOGGED BY (signature);	(gnature);						2013		341	sə	Standard	Special Processing	0
	REV	REVIEWED BY (signature):	(signature)						SINT			etse ldsn9	CLP-like	USACE	
any		Date	Time		Roce	Received By / Company Name	Company	Name	-	Date	Time	0 vilaC	USACE	Navy	≥ :][][
AR MARKING AU	20	2-25-20	1540	2	1	1			2/2	2	5	1			
				4 4					-			Yes	Reportable to PADEP?	Sample Disposa	X NC
				0								# OISMd		Special	
		I													

ALS

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

F: (717) 944-1430

Condition of Sample Receipt Form

2. Are Custody 3. Are Custody 4. Is there a CO 5. Are the COC	Seals on sample containers intact?	A A	YES.	NO
3. Are Custody 4. Is there a CO 5. Are the COC	Seals on shipping containers intact?	OND		NO
3. Are Custody 4. Is there a CO 5. Are the COC	Seals on sample containers intact?	OND		NIG
3. Are Custody 4. Is there a CO 5. Are the COC	Seals on sample containers intact?	OND		INC.
4. Is there a CO 5. Are the COC	C (Chain-of-Custody) present?		YES	NO
5. Are the COC			TED	NO
	and bottle labels complete, legible and in agreement?		MESS	NO
sa. Does the	COC contain sample locations?		YES	NO
	COC contain date and time of sample collection for all samples?	-	1155	NO
	COC contain sample collectors name?		YED	NO
	COC note the type(s) of preservation for all bottles?			NO
	COC note the number of bottles submitted for each sample?			NO
	COC note the type of sample, composite or grab?			NO
	COC note the matrix of the sample(s)?		YES	NO
	us samples requiring preservation preserved correctly? ¹ N	1000	YES	NO
	ples placed in the proper containers for the requested analyses, with sufficient volume?			
. Are all sample	es within holding times for the requested analyses? PL 13 ever sed	C	YES	S
	le containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	
	ve trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?			NO
	nples received on ice?		YES	NO
	temperatures measured at 0.0-6.0°C			NO
				NO
	ples DW matrix ? If YES, fill out Reportable Drinking Water questions below			NO
	samples required for SDWA compliance reporting?		YES	MO
the second se	client provide a SDWA PWS ID#?	M	YES	NO
		/A	YES	NO
	A server a server server and the se	/A)	YES	NO
13e. Did the	client provide the SDWA sample type (D, E, R, C, P, S)?	14	YES	NO
	Cooler #:			
Ter	nperature (°C); S			
Teu				
The	ermometer ID: 407			
Rad	ological (µCi)			
- Vel			-	-

*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







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

March 2, 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:	3088003
Purchase Order:	PO1000126	Workorder ID:	1ST QTR 2020-3100 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, February 21, 2020.

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

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

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

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

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

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

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

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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SAMPLE SUMMARY

Workorder: 3088003 1ST QTR 2020-3100 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3088003001	3100 River Road, Conestoga, PA	Water	2/21/2020 09:39	2/21/2020 15:43	Mr. Brian G Shade

ALS Environmental Laboratory Locations Across North America





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SAMPLE SUMMARY

Workorder: 3088003 1ST 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 Laboratory Locations Across North America





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ANALYTICAL RESULTS

Workorder: 3088003 1ST QTR 2020-3100 RIVER RD

Results	Flag	Linite							
		Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
ND		ug/L	1.0	SW846 8260B			2/26/20 00:47	PDK	К
ND		ug/L	1.0	SW846 8260B			2/26/20 00:47	PDK	К
ND		ug/L	1.0	SW846 8260B			2/26/20 00:47	PDK	К
ND		ug/L	1.0	SW846 8260B			2/26/20 00:47	PDK	К
ND		ug/L	1.0	SW846 8260B			2/26/20 00:47	PDK	К
ND		ug/L	1.0	SW846 8260B			2/26/20 00:47	PDK	К
ND		ug/L	1.0	SW846 8260B			2/26/20 00:47	PDK	К
ND		ug/L	1.0	SW846 8260B			2/26/20 00:47	PDK	К
ND		ug/L	1.0	SW846 8260B			2/26/20 00:47	PDK	К
ND		ug/L	1.0	SW846 8260B			2/26/20 00:47	PDK	К
ND		ug/L	3.0	SW846 8260B			2/26/20 00:47	PDK	К
ND		ug/L	1.0	SW846 8260B			2/26/20 00:47	PDK	К
ND		ug/L	1.0	SW846 8260B			2/26/20 00:47	PDK	К
ND		ug/L	1.0	SW846 8260B			2/26/20 00:47	PDK	К
ND		ug/L	1.0	SW846 8260B			2/26/20 00:47	PDK	к
Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
115		%	62 - 133	SW846 8260B			2/26/20 00:47	PDK	К
115	3	%	79 - 114	SW846 8260B			2/26/20 00:47	PDK	К
107		%	78 - 116	SW846 8260B			2/26/20 00:47	PDK	K
110		%	76 - 127	SW846 8260B			2/26/20 00:47	PDK	К
15		mg/L	5	SM2320B-2011			2/25/20 20:24	MBW	С
15	1	mg/L	5	SM2320B-2011			2/25/20 20:24	MBW	С
0.104		mg/L	0.100	ASTM D6919-09			2/28/20 03:35	JWB	В
ND		mg/L	15	EPA 410.4			2/26/20 23:30	JAM	В
50.8		mg/L	2.0	EPA 300.0			2/22/20 10:53	MBW	С
ND		mg/L	0.20	EPA 300.0			2/22/20 10:53	MBW	С
ND		ug/L	20.0	SW846 9020B			2/24/20 15:44	PAG	I
4.2		mg/L	0.20	EPA 300.0			2/22/20 10:53	MBW	С
ND		mg/L	0.20	EPA 300.0			2/22/20 10:53	MBW	С
6.48	2	pH_Units		S4500HB-11			2/25/20 20:24	MBW	С
ND		ng/L	0.005	EPA 420.4	2/24/20 09:41	C_D	2/26/20 05:48	C_D	н
		0				-		_	
10.7								MBW	C
_	ND ND ND ND ND ND ND ND ND ND ND Results 115 107 110 15 15 0.104 ND 50.8 ND S0.8 ND ND 4.2 ND ND 4.2 ND 253	ND Results Flag 115 115 15 15 15 15 15 15 15 15 15 15 15 50.8 ND ND 4.2 ND 6.48 2 ND 253	ND ug/L 115 3 107 % 110 % 115 1 15 1 0.104 mg/L ND mg/L ND ug/L 4.2 mg/L ND mg/L ND <	ND ug/L 1.0 ND staits 1.0 115 3 % 62-133 115 3 % 79-114 107 % 78-116 110	ND ug/L 1.0 SW846 8260B 107 % 78 - 116 SW846 8260B 107 % 76 - 127 SW846 8260B 10 <td< td=""><td>ND ug/L 1.0 SW846 8260B ND ug/L 1.0 SW846 8260B 115 3 % 79 - 114 SW846 8260B 107 % 78 - 116 SW846 8260B 110 % 76 - 127 SW846 8260B <</td><td>ND ug/L 1.0 SW846 8260B ND ug/L 1.0 SW846 8260B 107 % 62 - 133 SW846 8260B 107 % 78 - 116 SW846 8260B 107 <t< td=""><td>ND ug/L 1.0 SW846 8260B 2/26/20 00:47 ND ug/L 1.0 SW846 8260B 2/26/20 00:47 115 %</td><td>ND ug/L 1.0 SW846 8260B 2/26/20 00:47 PDK ND ug/L 1.0 SW846 8260B 2/26/20 00:47 PDK 115 3 % 79-114<!--</td--></td></t<></td></td<>	ND ug/L 1.0 SW846 8260B 115 3 % 79 - 114 SW846 8260B 107 % 78 - 116 SW846 8260B 110 % 76 - 127 SW846 8260B <	ND ug/L 1.0 SW846 8260B 107 % 62 - 133 SW846 8260B 107 % 78 - 116 SW846 8260B 107 <t< td=""><td>ND ug/L 1.0 SW846 8260B 2/26/20 00:47 ND ug/L 1.0 SW846 8260B 2/26/20 00:47 115 %</td><td>ND ug/L 1.0 SW846 8260B 2/26/20 00:47 PDK ND ug/L 1.0 SW846 8260B 2/26/20 00:47 PDK 115 3 % 79-114<!--</td--></td></t<>	ND ug/L 1.0 SW846 8260B 2/26/20 00:47 115 %	ND ug/L 1.0 SW846 8260B 2/26/20 00:47 PDK 115 3 % 79-114 </td

ALS Environmental Laboratory Locations Across North America





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: 3088003 1ST QTR 2020-3100 RIVER RD

Lab ID: 3088003001 Sample ID: 3100 River Ro	ad, Conestoga, F	PA			2/21/2020 09:39 2/21/2020 15:43	Matrix: V	Vater	
Parameters	Results Flag	Units	RDL	Method	Prepared By	Analyzed	Ву	Cntr
Total Dissolved Solids	162	mg/L	25	S2540C-11		2/26/20 15:51	D1C	С
Total Organic Carbon (TOC)	ND	mg/L	0.50	SM5310B-2011		2/25/20 00:21	PAG	F
Turbidity	ND	NTU	0.10	SM2130B-2011		2/22/20 07:38	R2B	С
METALS								
Calcium, Total	20.1	mg/L	0.050	EPA 200.7	2/25/20 16:14 SXC	2/26/20 13:57	MNP	D1
Calcium, Dissolved	18.9	mg/L	0.10	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:01	MNP	E
Iron, Total	ND	mg/L	0.030	EPA 200.7	2/25/20 16:14 SXC	2/26/20 13:57	MNP	D1
Iron, Dissolved	ND	mg/L	0.060	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:01	MNP	E
Magnesium, Total	7.6	mg/L	0.050	EPA 200.7	2/25/20 16:14 SXC	2/26/20 13:57	MNP	D1
Magnesium, Dissolved	7.2	mg/L	0.10	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:01	MNP	E
Manganese, Total	0.0090	mg/L	0.0025	EPA 200.7	2/25/20 16:14 SXC	2/26/20 13:57	MNP	D1
Manganese, Dissolved	0.0088	mg/L	0.0050	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:01	MNP	E
Potassium, Total	1.3	mg/L	0.25	EPA 200.7	2/25/20 16:14 SXC	2/26/20 13:57	MNP	D1
Potassium, Dissolved	1.1	mg/L	0.50	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:01	MNP	E
Sodium, Total	18.5	mg/L	0.25	EPA 200.7	2/25/20 16:14 SXC	2/26/20 13:57	MNP	D1
Sodium, Dissolved	16.7	mg/L	0.50	EPA 200.7	2/24/20 12:26 MNF	2/26/20 10:01	MNP	E
FIELD PARAMETERS								
pH, Field (SM4500B)	5.18	pH_Units		Field		2/21/20 09:39	BGS	Ν
Specific Conductance, Field	268	umhos/cm	1	Field		2/21/20 09:39	BGS	Ν
Temperature	12.60	Deg. C		Field		2/21/20 09:39	BGS	Ν

Susand. Schare

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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: 3088003 1ST QTR 2020-3100 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3088003001	1	3100 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is	s titrate	d to a pH of 4.5 and reported as mg 0	CaCO3/L.	
3088003001	2	3100 River Road, Conestoga, PA	S4500HB-11	pH
			rs identified as "analyze immediately" ding time when analyzed in the laborat	

3088003001 3 3100 River Road, Conestoga, PA SW846 8260B 4-Bromofluorobenzene

The surrogate 4-Bromofluorobenzene for method SW846 8260B was outside of control limits. The % Recovery was reported as 115 and the control limits were 79 to 114. This result was reported at a dilution of 1.

ALS Environmental Laboratory Locations Across North America





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: 3088003 1ST QTR 2020-3100 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3088003001	3100 River Road, Conestoga, PA	ASTM D6919-09	
3088003001	3100 River Road, Conestoga, PA	EPA 200.7	EPA ACID
3088003001	3100 River Road, Conestoga, PA	EPA 200.7	EPA TRMD
3088003001	3100 River Road, Conestoga, PA	EPA 300.0	
3088003001	3100 River Road, Conestoga, PA	EPA 410.4	
3088003001	3100 River Road, Conestoga, PA	EPA 420.4	420.4/9066
3088003001	3100 River Road, Conestoga, PA	Field	
3088003001	3100 River Road, Conestoga, PA	S2540C-11	
3088003001	3100 River Road, Conestoga, PA	S4500HB-11	
3088003001	3100 River Road, Conestoga, PA	SM2130B-2011	
3088003001	3100 River Road, Conestoga, PA	SM2320B-2011	
3088003001	3100 River Road, Conestoga, PA	SM2510B-2011	
3088003001	3100 River Road, Conestoga, PA	SM5310B-2011	
3088003001	3100 River Road, Conestoga, PA	SW846 8260B	
3088003001	3100 River Road, Conestoga, PA	SW846 9020B	

ALS Environmental Laboratory Locations Across North America

(ALS) ELLON OFTICOLOGIE AND ALMENT IN ALMENTE I TRANSPORT Dependent I and a Linderman DA 1762 + 717 ALM FM 1 + FM 717 BM4 1430	717 944 1430	1	ALL SI	HADED SAA	AREAS	MUST I	CTIONS	D AREAS MUST BE COMPLETED BY TH MPLER. INSTRUCTIONS ON THE BACK	ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT I SAMPLER. INSTRUCTIONS ON THE BACK.	CLENT		≣* 	3 0 8	* 5 0 0 8	
Client Name - LCSWMA - Larv Kirchner		Container	AG		AN	AN	CG	-	PL PL	ર	L P	<u>]</u>	-	Yb	uy Receiving Lab)
Address: 3100 River Road		Container	40 ml	ni 125 mi	-	250 ml 40	40 ml	- 250	250 ml 125 ml	-	125 ml 500 ml	mi S00 mi	Cooler Temp:	np: O Therm ID: LAT	E
Conestoda, PA 17516	1	Preservative	# FC	H2SO4	-	H2SO4 F	Ę	H H2	H2SO4 HNO3	SONH EC	O3 None	anoN an	No. of Coo	≻[;;	N Initial
Contact: Larry Kirchner						ANALY	SESIMET	ANALYSES/METHOD REQUESTED	UESTED			-		Custody Seals Present?	
Phone#: (717) 584-0030					-		-	1	ʻu	-	4	-	E	(if present) Seals Intact?	
Project Name/#: LCSWMA - Quarterly		_		-	_		-	1	W '6	ch	-	-	1000	Received on Ice?	
Bill To: Lancaster County Solid Waste MA.		_	-		_	-			W 'a		-	_	COCILabe	COC/Labels Complete/Accurate?	
TAT X Normal-Standard TAT is 10-12 business days. Rush-Subject to ALS approval and surcharges.	ss days. rcharges. v:						500A		R ,60 :slete	-11 -11 -2	DS' NO3' CI			Cont. in 5000 Cond.? Correct Containers? Correct Sample Valumes?	
				-			978-9							Correct Preservation?	
		_	00		но	xc	_	-	loss	eN.		IS 'q	Permission Headsport	Headspace/Volatilios?	-
Sample Description/Location Sample (38 a will speed on the lab report) Date	Time	10 D.	1	-	1.100	Number	1 Contain	ers Per San	le or Fiel	A Results	Below.			Sample/COC Comments	Its
1 3100RIVERRD 02/21/20	0 0939	G DW	N 2	15	-	2 3	3× ×		1 4		-				
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10				-					-			_	DOther:		
Project Comments:	LOGGED BY(signature):	Y(signatur	::					31/5		-	1		Slandard	Special Processing	State Samples
	REVIEWED BY(signature):	BY(signat	ure):					100		946	516	Idena	CLP-like	USACE	
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			1												

ALS

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
P. (1949) 044 4404

Condition of Sample Receipt Form

ALS

Client: LOSW MA	Work Order #: 30FFUB Initials:	Date:	2/201:	2020
I. Were airbills / tracking numbers	present and recorded?	NONS	YES	NO
	Tracking number:			
. Are Custody Seals on shipping co	ontainers intact?	NONE	YES	NO
	ntainers intact?		YES	NO
	/) present?			NO
. Are the COC and bottle labels co	mplete, legible and in agreement?			NO
	le locations?			NO
	and time of sample collection for all samples?			NO
	le collectors name?		-	NO
5d. Does the COC note the type	(s) of preservation for all bottles?		YES	NO
Se. Does the COC note the numb	ber of bottles submitted for each sample?		VES	NO
	of sample, composite or grab?			NO
5g. Does the COC note the matri	ix of the sample(s)?		TED	NO
	g preservation preserved correctly?"			NO
. Were all samples placed in the pr	oper containers for the requested analyses, with sufficient volu			NO
	nes for the requested analyses? Ph. 13, etc.			GR
. Were all sample containers receiv	ved intact and headspace free when required? (not broken, leak	ing, frozen, etc.)		NO
	lies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?		YES	NO
	:e?	\smile		NO
2. Were sample temperatures mea	sured at 0.0-6.0°C		and the second sec	NO
	YES, fill out Reportable Drinking Water questions below			NO
	or SDWA compliance reporting?		YES	NO
	WA PWS ID#?		YES	NO
13c. Are all aqueous unpreserved	d SDWA samples pH 5-9?		YES'	NO
13d. Did the client provide the SI	DWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SI	DWA sample type (D, E, R, C, P, S)?		YES	NO
Cooler #:				_
Temperature (°C): O				
Thermometer ID: 40	<u>n</u>			
Radiological (µCi):				
Thermometer ID: 40	<u>n</u>	= =		





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

March 2, 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:	3088000
Purchase Order:	PO1000126	Workorder ID:	1ST QTR 2020-3106 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, February 21, 2020.

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

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

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

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

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

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

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

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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: 3088000 1ST QTR 2020-3106 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3088000001	3106 River Road, Conestoga, PA	Water	2/21/2020 09:52	2/21/2020 15:43	Mr. Brian G Shade

ALS Environmental Laboratory Locations Across North America





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: 3088000 1ST QTR 2020-3106 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

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ANALYTICAL RESULTS

Workorder: 3088000 1ST QTR 2020-3106 RIVER RD

Lab ID: 3088000001 Sample ID: 3106 River Ro	oad, Conest	oga, PA			Date Collected: Date Received:			Matrix: V	Vater	
Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			2/25/20 23:39	PDK	К
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/25/20 23:39	PDK	К
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/25/20 23:39	PDK	К
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/25/20 23:39	PDK	К
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/25/20 23:39	PDK	К
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/25/20 23:39	PDK	К
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/25/20 23:39	PDK	К
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/25/20 23:39	PDK	К
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/25/20 23:39	PDK	К
Toluene	ND		ug/L	1.0	SW846 8260B			2/25/20 23:39	PDK	К
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/25/20 23:39	PDK	К
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/25/20 23:39	PDK	К
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/25/20 23:39	PDK	К
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			2/25/20 23:39	PDK	К
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/25/20 23:39	PDK	К
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	114		%	62 - 133	SW846 8260B			2/25/20 23:39	PDK	K
4-Bromofluorobenzene (S)	117	5	%	79 - 114	SW846 8260B			2/25/20 23:39	PDK	К
Dibromofluoromethane (S)	107		%	78 - 116	SW846 8260B			2/25/20 23:39	PDK	K
Toluene-d8 (S)	109		%	76 - 127	SW846 8260B			2/25/20 23:39	PDK	К
WET CHEMISTRY										
Alkalinity, Bicarbonate	16		mg/L	5	SM2320B-2011			2/25/20 20:24	MBW	A
Alkalinity, Total	16	1	mg/L	5	SM2320B-2011			2/25/20 20:24	MBW	A
Ammonia-N	0.127		mg/L	0.100	ASTM D6919-09			2/28/20 01:04	JWB	В
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			2/26/20 19:00	JAM	В
Chloride	122		mg/L	2.0	EPA 300.0			2/22/20 08:38	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			2/22/20 08:38	MBW	С
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			2/24/20 13:08	PAG	I
Nitrate-N	14.2		mg/L	0.20	EPA 300.0			2/22/20 08:38	MBW	С
Nitrite-N	ND		mg/L	0.20	EPA 300.0			2/22/20 08:38	MBW	С
рН	6.54	2	pH_Units		S4500HB-11			2/25/20 20:24	MBW	A
Phenolics	ND		mg/L	0.005	EPA 420.4	2/24/20 09:41	СD	2/26/20 05:48	C_D	н
Specific Conductance	537		umhos/cm	1	SM2510B-2011			2/25/20 20:24	_	
Sulfate	6.2		mg/L	2.0	EPA 300.0			2/22/20 08:38		
										-

ALS Environmental Laboratory Locations Across North America





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ANALYTICAL RESULTS

Workorder: 3088000 1ST QTR 2020-3106 RIVER RD

Lab ID: 3088000001 Sample ID: 3106 River Ro	ad, Conest	oga, PA				2/21/2020 09:5 2/21/2020 15:4		Matrix: W	/ater	
Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
Total Dissolved Solids	304		mg/L	25	S2540C-11			2/26/20 15:51	D1C	С
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			2/25/20 00:21	PAG	F
Turbidity	1.12		NTU	0.10	SM2130B-2011			2/22/20 07:38	R2B	С
METALS										
Calcium, Total	24.4		mg/L	0.050	EPA 200.7	2/23/20 16:27	SXC	2/25/20 13:43	MNP	D1
Calcium, Dissolved	18.0	3	mg/L	0.10	EPA 200.7	2/24/20 12:26	MNP	2/26/20 09:44	MNP	E
Iron, Total	0.061		mg/L	0.030	EPA 200.7	2/23/20 16:27	SXC	2/25/20 13:43	MNP	D1
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	2/24/20 12:26	MNP	2/26/20 09:44	MNP	E
Magnesium, Total	16.2		mg/L	0.050	EPA 200.7	2/23/20 16:27	SXC	2/25/20 13:43	MNP	D1
Magnesium, Dissolved	6.8	4	mg/L	0.10	EPA 200.7	2/24/20 12:26	MNP	2/26/20 09:44	MNP	E
Manganese, Total	0.047		mg/L	0.0025	EPA 200.7	2/23/20 16:27	SXC	2/25/20 13:43	MNP	D1
Manganese, Dissolved	0.0081		mg/L	0.0050	EPA 200.7	2/24/20 12:26	MNP	2/26/20 09:44	MNP	E
Potassium, Total	2.1		mg/L	0.25	EPA 200.7	2/23/20 16:27	SXC	2/25/20 13:43	MNP	D1
Potassium, Dissolved	0.92		mg/L	0.50	EPA 200.7	2/24/20 12:26	MNP	2/26/20 09:44	MNP	E
Sodium, Total	58.0		mg/L	0.25	EPA 200.7	2/23/20 16:27	SXC	2/26/20 13:41	MNP	D1
Sodium, Dissolved	16.4		mg/L	0.50	EPA 200.7	2/24/20 12:26	MNP	2/26/20 09:44	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	5.28		pH_Units		Field			2/21/20 09:52	BGS	Ν
Specific Conductance, Field	553		umhos/cm	1	Field			2/21/20 09:52	BGS	Ν
Temperature	12.50		Deg. C		Field			2/21/20 09:52	BGS	Ν

Susand. Schare

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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ANALYTICAL RESULTS

Workorder: 3088000 1ST QTR 2020-3106 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3088000001	1	3106 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity	is titrate	ed to a pH of 4.5 and reported as mg 0	CaCO3/L.	
3088000001	2	3106 River Road, Conestoga, PA	S4500HB-11	рН
			rs identified as "analyze immediately" ding time when analyzed in the laborat	
3088000001	3	3106 River Road, Conestoga, PA	EPA 200.7	Calcium, Dissolved
		e analyses performed on this sample f Matrix interferences are the possible	ailed to meet acceptable recovery limic cause for the failure.	ts. The other matrix spike was within
3088000001	4	3106 River Road, Conestoga, PA	EPA 200.7	Magnesium, Dissolved
		e analyses performed on this sample f Matrix interferences are the possible	ailed to meet acceptable recovery limi cause for the failure.	ts. The other matrix spike was within
3088000001	5	3106 River Road, Conestoga, PA	SW846 8260B	4-Bromofluorobenzene
0		probenzene for method SW846 8260B 4. This result was reported at a dilutio	was outside of control limits. The % R	ecovery was reported as 117 and the

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3088000 1ST QTR 2020-3106 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3088000001	3106 River Road, Conestoga, PA	ASTM D6919-09	
3088000001	3106 River Road, Conestoga, PA	EPA 200.7	EPA ACID
3088000001	3106 River Road, Conestoga, PA	EPA 200.7	EPA TRMD
3088000001	3106 River Road, Conestoga, PA	EPA 300.0	
3088000001	3106 River Road, Conestoga, PA	EPA 410.4	
3088000001	3106 River Road, Conestoga, PA	EPA 420.4	420.4/9066
3088000001	3106 River Road, Conestoga, PA	Field	
3088000001	3106 River Road, Conestoga, PA	S2540C-11	
3088000001	3106 River Road, Conestoga, PA	S4500HB-11	
3088000001	3106 River Road, Conestoga, PA	SM2130B-2011	
3088000001	3106 River Road, Conestoga, PA	SM2320B-2011	
3088000001	3106 River Road, Conestoga, PA	SM2510B-2011	
3088000001	3106 River Road, Conestoga, PA	SM5310B-2011	
3088000001	3106 River Road, Conestoga, PA	SW846 8260B	
3088000001	3106 River Road, Conestoga, PA	SW846 9020B	

ALS Environmental Laboratory Locations Across North America

Client Name - LCSWMA - Aaron Fry	44,1430	Ä	ALL SHADE S/	JEO ARE SAMPLE	ED AREAS MUST BE COMPLETED BY THI AMPLER. INSTRUCTIONS ON THE BACK	T BE CO KUCTION	MPLETE US ON TI		THE CLIENT CK.			* 3 0 8		-
	3	Containes	AG	AN	AN	DO	1	Ч	Ъ	Ъ	PL	1	A .	l by Receiving Lab)
Address: 3106 River Road	3	Container	40 m)	125 ml	250 ml	40 HI	T	250 ml	125 ml	125 mf	500 ml 5	500 ml Cooler Temp:	emp: S Them ID: UG	Б
Conestoga, PA 17516	Pres	Preservative	Ę	HZSOM	H2SO4	HCI	1	H2SO4	HNO3	HNO3	None	None No. of Coolers:	olers:	N [
Contact: Aaron Fry					ANAL	ANALYSESIMETHOD	THOD R	REQUESTED		Ì	Ì	П	Custody Seals Present?	
Phone#: (717) 669-6831				ŀ					'u		4		(If present) Seals Intact?	
Project Namel#: LCSWMA - Quarterly	Π								W '6	en	4.6		Received on Ice?	
Bill To: LCSWMA - Aaron Fry							_	-	w 'a	ĸ	os'	COCH	COCILabels Complete/Accurate?	
TAT X Normal-Standard TAT is 10-12 business days. Rush-Subject to ALS approval and surcharges. Date Required:	, si					\$ AOC?			elais: Ca, Fe	'uw '6w 'ag	DS' NO3' CI		Cont. In Good Cond.7 Correct Containers? Correct Sample Volumes?	
	Π			Ĵ.		928-9		n' cot	W Dav	'eg :s		н .үй	Correct Preservation?	
Fax? 7-Y No:	3		0	н	x	948	ļ		eN Nos	siel	ds '		Headspace/Volatiles?	
Sample Description/Location Sample (as it will appear on the tab report) Date Time	E or	nteM**	101	50	口 S 歪 王 当文 S Sample or Field Results Below	S Conta	iners Per	A Sample or	Field Rest	Ats Below	Hq	11	Courier/Tracking #: Sample/COC Comments	됕
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Project Comments:	COGGED BY(signature):	gneture):					T	10 34			səldi e	CLP-like	USACE USACE	Collected In
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	t										EDDS: F	EDDS: Format Type-	T	

ALS

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

• • •

Condition of Sample Receipt Form

LOSWMA 30F8003	Date:	120/2	on>
1. Were airbills / tracking numbers present and recorded?	NONS	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?		YES	NO
3. Are Custody Seals on sample containers intact?		YES	NO
4. Is there a COC (Chain-of-Custody) present?			NO
5. Are the COC and bottle labels complete, legible and in agreement?			NO
Sa. Does the COC contain sample locations?			NO
Sb. Does the COC contain date and time of sample collection for all samples?			NO
Sc. Does the COC contain sample collectors name?			NO
Sd. Does the COC note the type(s) of preservation for all bottles?			NO
Se. 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?			NO
5g. Does the COC note the matrix of the sample(s)?		TED	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)	NQ
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)?	NTA	YES	NO
11. Were the samples received on ice?	<u> </u>	(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
I 3a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	NTAL	YES	NO
I 3c. 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)?	1	YES	NO
Cooler #:			
Temperature (°C): S			
Thermometer ID. 407			
Radiological (µCi):			

Final deterministion 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







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March 2, 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:	3088005
Purchase Order:	PO1000126	Workorder ID:	1ST QTR 2020-3125 RIVER RD

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, February 21, 2020.

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

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

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

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

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

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

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

Ms. Susan J Scherer Project Coordinator

ALS Environmental Laboratory Locations Across North America





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SAMPLE SUMMARY

Workorder: 3088005 1ST QTR 2020-3125 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3088005001	3125 River Road, Conestoga, PA	Water	2/21/2020 12:00	2/21/2020 15:43	Mr. Brian G Shade

ALS Environmental Laboratory Locations Across North America





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SAMPLE SUMMARY

Workorder: 3088005 1ST QTR 2020-3125 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

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ANALYTICAL RESULTS

Workorder: 3088005 1ST QTR 2020-3125 RIVER RD

Lab ID: 3088005001 Sample ID: 3125 River Ro	ad, Conest	oga, PA	\		Date Collected: Date Received:			Matrix: V	Vater	
Parameters	Results	Flag	Units	RDL	Method	Prepared	Ву	Analyzed	Ву	Cntr
WET CHEMISTRY										
Alkalinity, Bicarbonate	167		mg/L	5	SM2320B-2011			2/25/20 20:24	MBW	С
Alkalinity, Total	167	1	mg/L	5	SM2320B-2011			2/25/20 20:24	MBW	С
Ammonia-N	ND		mg/L	0.100	ASTM D6919-09			2/28/20 07:01	JWB	В
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			2/27/20 01:30	JAM	В
Chloride	120		mg/L	2.0	EPA 300.0			2/22/20 11:27	MBW	С
Fluoride	ND		mg/L	0.20	EPA 300.0			2/22/20 11:27	MBW	С
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			2/25/20 13:36	PAG	I
Nitrate-N	5.9		mg/L	0.20	EPA 300.0			2/22/20 11:27	MBW	С
Nitrite-N	ND		mg/L	0.20	EPA 300.0			2/22/20 11:27	MBW	С
рН	7.84	2	pH_Units		S4500HB-11			2/25/20 20:24	MBW	С
Phenolics	ND		mg/L	0.005	EPA 420.4	2/24/20 09:41	C_D	2/26/20 05:48	C_D	Н
Specific Conductance	757		umhos/cm	1	SM2510B-2011			2/25/20 20:24	MBW	С
Sulfate	16.6		mg/L	2.0	EPA 300.0			2/22/20 11:27	MBW	С
Total Dissolved Solids	420		mg/L	25	S2540C-11			2/26/20 15:51	D1C	С
Total Organic Carbon (TOC)	0.66		mg/L	0.50	SM5310B-2011			2/25/20 04:59	PAG	F
Turbidity	ND		NTU	0.10	SM2130B-2011			2/22/20 07:38	R2B	С
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:33	PDK	К
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 01:33	PDK	К
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 01:33	PDK	К
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:33	PDK	К
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:33	PDK	К
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:33	PDK	
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:33	PDK	К
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/26/20 01:33		
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:33		
Toluene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:33		
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/26/20 01:33	PDK	
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/26/20 01:33		
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/26/20 01:33		
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			2/26/20 01:33	PDK	
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/26/20 01:33	PDK	К
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	115		%	62 - 133	SW846 8260B			2/26/20 01:33	PDK	К

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ANALYTICAL RESULTS

Workorder: 3088005 1ST QTR 2020-3125 RIVER RD

Lab ID: 3088005001 Sample ID: 3125 River Ro	ad, Conestog	a, PA			2/21/2020 12:00 2/21/2020 15:43	Matrix: V	/ater
Parameters	Results F	-lag Units	RDL	Method	Prepared By	Analyzed	By Cntr
4-Bromofluorobenzene (S)	114	%	79 - 114	SW846 8260B		2/26/20 01:33	PDK K
Dibromofluoromethane (S)	105	%	78 - 116	SW846 8260B		2/26/20 01:33	PDK K
Toluene-d8 (S)	110	%	76 - 127	SW846 8260B		2/26/20 01:33	PDK K
METALS							
Calcium, Total	19.5	mg/L	0.050	EPA 200.7	2/25/20 16:14 SX	C 2/26/20 14:22	MNP D1
Calcium, Dissolved	15.0	mg/L	0.10	EPA 200.7	2/24/20 12:26 MM	P 2/26/20 10:07	MNP E
Iron, Total	ND	mg/L	0.030	EPA 200.7	2/25/20 16:14 SX	C 2/26/20 14:22	MNP D1
Iron, Dissolved	ND	mg/L	0.060	EPA 200.7	2/24/20 12:26 MM	P 2/26/20 10:07	MNP E
Magnesium, Total	2.7	mg/L	0.050	EPA 200.7	2/25/20 16:14 SX	C 2/26/20 14:22	MNP D1
Magnesium, Dissolved	3.0	mg/L	0.10	EPA 200.7	2/24/20 12:26 MM	P 2/26/20 10:07	MNP E
Manganese, Total	0.015	mg/L	0.0025	EPA 200.7	2/25/20 16:14 SX	C 2/26/20 14:22	MNP D1
Manganese, Dissolved	0.014	mg/L	0.0050	EPA 200.7	2/24/20 12:26 MM	P 2/26/20 10:07	MNP E
Potassium, Total	36.9	mg/L	0.25	EPA 200.7	2/25/20 16:14 SX	C 2/26/20 14:22	MNP D1
Potassium, Dissolved	24.6	mg/L	0.50	EPA 200.7	2/24/20 12:26 MM	P 2/26/20 10:07	MNP E
Sodium, Total	133	mg/L	0.25	EPA 200.7	2/25/20 16:14 SX	C 2/26/20 14:22	MNP D1
Sodium, Dissolved	117	mg/L	0.50	EPA 200.7	2/24/20 12:26 MM	P 2/26/20 10:07	MNP E
FIELD PARAMETERS							
pH, Field (SM4500B)	6.59	pH_Units		Field		2/21/20 12:00	BGS N
Specific Conductance, Field	763	umhos/cm	1	Field		2/21/20 12:00	BGS N
Temperature	15.10	Deg. C		Field		2/21/20 12:00	BGS N

Susand. Schare

Ms. Susan J Scherer Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3088005 1ST QTR 2020-3125 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3088005001	1	3125 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity	is titrate	ed to a pH of 4.5 and reported as mg (CaCO3/L.	
3088005001	2	3125 River Road, Conestoga, PA	S4500HB-11	рН
The pH analysis is a	an "ana	lyze immediately" analysis. Paramete	rs identified as "analyze immediately"	require analysis within 15 minutes of

collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3088005 1ST QTR 2020-3125 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3088005001	3125 River Road, Conestoga, PA	ASTM D6919-09	
3088005001	3125 River Road, Conestoga, PA	EPA 200.7	EPA ACID
3088005001	3125 River Road, Conestoga, PA	EPA 200.7	EPA TRMD
3088005001	3125 River Road, Conestoga, PA	EPA 300.0	
3088005001	3125 River Road, Conestoga, PA	EPA 410.4	
3088005001	3125 River Road, Conestoga, PA	EPA 420.4	420.4/9066
3088005001	3125 River Road, Conestoga, PA	Field	
3088005001	3125 River Road, Conestoga, PA	S2540C-11	
3088005001	3125 River Road, Conestoga, PA	S4500HB-11	
3088005001	3125 River Road, Conestoga, PA	SM2130B-2011	
3088005001	3125 River Road, Conestoga, PA	SM2320B-2011	
3088005001	3125 River Road, Conestoga, PA	SM2510B-2011	
3088005001	3125 River Road, Conestoga, PA	SM5310B-2011	
3088005001	3125 River Road, Conestoga, PA	SW846 8260B	
3088005001	3125 River Road, Conestoga, PA	SW846 9020B	

ALS Environmental Laboratory Locations Across North America

(ALS) Environmental Promotos subless scipii - New 71344514 - Caritonian - See Applein)	1	ALL SHAD		AS MUS	T BE CO	MPLETE	ED AREAS MUST BE COMPLETED BY THE CLIENT	HE CLIE	117				-
301 Fulling Nill Road * Middletown, PA 17057 * 717.944.5541 * Fax: 717.944.1430	717,944,143			SAMPL	R. INST	RUCTION	IS ON T	SAMPLER. INSTRUCTIONS ON THE BACK	ç]			
Client Name: LCSWMA - Christian C. Beck	Ĩ	Container	AG	AN	AN	CG	f	Ч	Ъ	Ы	2	D		ng Lab)
Address: 3125 River Road		Container Size	40 ml	125 ml	250 m)	40 ml	1	250 ml	125 ml	125 ml	500 ml	500 ml Cooler	Cooler Temp: 2 Them ID: 4VBV	
Conestoga, PA 17516		Preservative	Ę	H2SO4	H2SO4	HCI	1	H2SO4	HNO3	HNO3	None	None No. of Coolers:	z[>	Initial
Contact: Christian C. Beck		1			ANA	YSES/ME	THOD R	ANALYSES/METHOD REQUESTED	0				Custody Seals Present?	
Phone#: (717)871-0448									4				(if present) Seals Intact?	
Project Namel#: LCSWMA - Ouarterly								J	. M.	e	91		Received on Ice?	
Bill To: Lancaster County Solid Waste MA									5w 'a	ки	7OS	COCI	COCILabels Complete/Accurate?	
TAT X Normal-Standard TAT is 10-12 business days. TAT Rush-Subject to ALS approval and surcharges. Date Required: Email?	days. harges.					SEG VOCs		000	d Metals: Ca, Fe	,nM ,gM ,97 ,63	' NOS' NO3' CI'	V HCO3	Cont. In Good Cond.? Correct Containers? Correct Sample Volumes? Correct Preservation?	
		-	1	н	;	3-998		-) :sie	SOC	Quinite	HeadspaceNolatiles?	
Sample Description/Location Sample (as it will gippear on the lab report) Date	Time	G or C	100	0-0	Iter Numbe	rol Conta	M	- Jo	Fleid Resi	It's Below	'Hd		Courier/Tracking #: Sample/COC Comments	
1 3125RIVERRD 02/21/20	1200	G DW	2	£	2	3Z ×		4	1	÷	÷	÷		
2		11				100-				1				
3						Jak	an							
		111												
5											12	-		
5		1										1		
											11			
8					-	1				ni				
J. J	1											ALS	ALS Field Services: DPickup OLabor OComposite Sampling ORental Equipment	CLabor
10												DOther:	- 11	
Project Comments:	LOGGED BY(signature):	(signature):						100		371	Sə	Standard	S	Samp
	REVIEWED BY(signature):	8Y(signature	#				200			371	eta Idena Idena	OLP-like		Collected In
A C A MACON BAY Company Name	Date	Time 1643	2	Recei	Received By / Company Name	ompany	Vame	202	Date	Time	Deliv		Navy N N	ž z
			4					F			Reports	Reportable to PADEP?	Sample Disposal X	A S
2											# diswd	-	Special	NC.
			ę		1						EDDS: F	EDDS: Formal Type		

ALS

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

Condition of Sample Receipt Form

2. Were all samples placed in the proper containers for the requested analyses, with sufficient volume? 3. Are all samples within holding times for the requested analyses? 3. Were all sample containers received intact and headspace free when required? (not broken, leaking, froz 3. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 1. Were the samples received on Ice? 2. Were sample temperatures measured at 0.0-6.0°C.	N/A	66666666666	NO NO NO
 2. Are Custody Seals on shipping containers intact?	N/A	ାଡି (କି ଓ (କି (କି (କି (କି) କ	NO NO NO NO NO NO
 Are Custody Seals on sample containers intact?	N/A	ାଡି (କି ଓ (କି (କି (କି (କି) କ	NO NO NO NO NO NO
 Is there a COC (Chain-of-Custody) present?	N/A	ଜାନ୍ତ କାରିକ୍ତ କାର	0 NO NO NO NO NO
Are the COC and bottle labels complete, legible and in agreement?	N/A	ାଡି କିଡ଼ି କିଡ଼ି କିଡ଼ି ଜ	NO NO NO NO NO
 Are the COC and bottle labels complete, legible and in agreement?	N/A	ାଡି କିଡ଼ି କିଡ଼ି କିଡ଼ି ଜ	NO NO NO NO NO
 Sa. Does the COC contain sample locations?		କାଳ କାଳ କାଳ କାଳ	N0 N0 N0 N0 N0
5b. Does the COC contain date and time of sample collection for all samples?		କାର୍ଚ୍ଚ କାର୍ଚ୍ଚ କାର୍	NO NO NO NO
5d. Does the COC note the type(s) of preservation for all bottles? Se. Does the COC note the number of bottles submitted for each sample? 5f. Does the COC note the type of sample, composite or grab? 5g. Does the COC note the matrix of the sample(s)? Are all aqueous samples requiring preservation preserved correctly? Were all samples placed in the proper containers for the requested analyses, with sufficient volume? Are all samples within holding times for the requested analyses? Were all sample containers received intact and headspace free when required? (not broken, leaking, froz 0. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 1. Were the samples received on ice? 2. Were sample temperatures measured at 0.0-6.0°C 3. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting?		6666	NO NO
5d. Does the COC note the type(s) of preservation for all bottles? Se. Does the COC note the number of bottles submitted for each sample? 5f. Does the COC note the type of sample, composite or grab? 5g. Does the COC note the matrix of the sample(s)? Are all aqueous samples requiring preservation preserved correctly? Were all samples placed in the proper containers for the requested analyses, with sufficient volume? Are all samples within holding times for the requested analyses? Were all sample containers received intact and headspace free when required? (not broken, leaking, froz 0. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 1. Were the samples received on ice? 2. Were sample temperatures measured at 0.0-6.0°C 3. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting?		666	NO
 Se. Does the COC note the number of bottles submitted for each sample?		66	NO
5f. Does the COC note the type of sample, composite or grab? 5g. Does the COC note the matrix of the sample(s)? Are all aqueous samples requiring preservation preserved correctly? Were all samples placed in the proper containers for the requested analyses, with sufficient volume? Are all samples within holding times for the requested analyses? Were all sample containers received intact and headspace free when required? (not broken, leaking, froz 0. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 1. Were the samples received on ice? 2. Were sample temperatures measured at 0.0-6.0°C 3. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below. 13a. Are the samples required for SDWA compliance reporting?		6	
5g. Does the COC note the matrix of the sample(s)? Are all aqueous samples requiring preservation preserved correctly? Were all samples placed in the proper containers for the requested analyses, with sufficient volume? Are all samples within holding times for the requested analyses? Were all sample containers received intact and headspace free when required? (not broken, leaking, froz 0. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? 1. Were the samples received on ice? 2. Were sample temperatures measured at 0.0-6.0°C 3. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below. 13a. Are the samples required for SDWA compliance reporting?	N/A	···· (B)	
 Are all aqueous samples requiring preservation preserved correctly?¹ Were all samples placed in the proper containers for the requested analyses, with sufficient volume? Are all samples within holding times for the requested analyses? Were all sample containers received intact and headspace free when required? (not broken, leaking, froz 0. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? Were the samples received on ice? Were the sample temperatures measured at 0.0-6.0°C Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below. 13a. Are the samples required for SDWA compliance reporting? 	N/A	-	NO
 Were all samples placed in the proper containers for the requested analyses, with sufficient volume? Are all samples within holding times for the requested analyses? Were all sample containers received intact and headspace free when required? (not broken, leaking, froz Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? Were the samples received on ice? Were the sample temperatures measured at 0.0-6.0°C Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below. 13a. Are the samples required for SDWA compliance reporting? 			
Are all samples within holding times for the requested analyses? Were all sample containers received intact and headspace free when required? (not broken, leaking, froz O. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)? Were the samples received on ice? Were sample temperatures measured at 0.0-6.0°C. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below. 13a. Are the samples required for SDWA compliance reporting?			NO
 Were all sample containers received intact and headspace free when required? (not broken, leaking, froz O. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?			RB
 Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	en, etc.)	the second se	NO
 Were the samples received on Ice? Were sample temperatures measured at 0.0-6.0°C Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below 13a. Are the samples required for SDWA compliance reporting? 			NO
 Were sample temperatures measured at 0.0-6.0°C. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below. 13a. Are the samples required for SDWA compliance reporting? 		and the second sec	NO
3. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below			NO
13a. Are the samples required for SDWA compliance reporting?		and a strength	0.00
			NO
			NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?			NO
13d. Did the client provide the SDWA sample location ID/Description?		1.	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?		YES	NO
Cooler #			
Temperature (°C):			
Thermometer ID: 407		2	
		-	
Radiological (µCi):			

